Bidding document for-

Group A: Supply, Installation & Commissioning of Equipments for the department of Anaesthesiology
Group B: Supply, Installation & Commissioning of Equipment for the department of CTVS
Group C: Supply, Installation & Commissioning of Equipment for the department of General Surgery
Group D: Supply, Installation & Commissioning of Equipment for the department of G.I. Surgery
Group E: Supply, Installation & Commissioning of Equipment for the department of Neurology
Group F: Supply, Installation & Commissioning of Equipment for the department of Paediatric Surgery
Group G: Supply, Installation & Commissioning of Equipment for the department of Pathology
Group H: Supply, Installation & Commissioning of Equipment for the department of Physiology
Group I: Supply, Installation & Commissioning of Equipment for the department of Radiology
Group J: Supply, Installation & Commissioning of Equipment for RIO
Group K: Supply, Installation & Commissioning of Equipment for the department of Urology

BIDDING DOCUMENT

E- TENDER NOTICE No: 01/ 2024- 2025/ Bio-Medical Equipment/ IGIMS/ Store

Supply, Installation & Commissioning of Bio-Medical Equipment's / Instruments

E-TENDER NOTICE No: 01/ 2024- 2025/ Bio-Medical Equipment/ IGIMS/ Store

Issued to:

Cost of Document: **Rs.2500/-**

Paid By: Cash: Receipt No.:

Demand Draft: No.:

Issuing Bank:

(Authorized Signatory)

INDIRA GANDHI INSTITUTE OF MEDICAL SCIENCES,

SHEIKHPURA, PATNA - 800014.

INDEX

IMPORTANT DATES

1.	**Name & address of advertiser**	:	Director, IGIMS, Sheikhpura, Patna- 800014 (Bihar)
2.	**Date of issue of E-Tender notice**	:	**14/ 03/ 2024**
3.	**Period for download of tender document only on** www.eproc2.bihar.gov.in**.**	:	From **01/ 04/ 2024 to 07/ 05/ 2024 up to 12.00 hours** through above website
4.	**Date of Pre- Bid Clarifications**	:	**a. Group A, B & C on 09/ 04/ 2024 at 15.00** hours **b. Group D, E & F on 10/ 04/ 2024 at 15.00** hours **c. Group G on 12/ 04/ 2024 at 15.00** hours **d. Group H, I, J & K on 15/ 04/ 2024 at 15.00** hours
5.	**Last date & Time for submission / uploading of complete tender at** www.eproc2.bihar.gov.in**.**	:	**07/ 05/ 2024** up to **17.00 Hours**
6.	**Last date, time and place for submission of hard copy of the Technical bid along with EMD & Tender Document Fee at Director's office, I.G.I.M.S., Patna by Speed / Registered post / Courier only**	:	**08/ 05/ 2024 up to 16.00 Hours**, at Director IGIMS, Patna-800014 (Bihar)
7.	**Date, Time and Place of opening of Techno Commercial bid only on** www.eproc2.bihar.gov.in**.**	:	On www.eproc2.bihar.gov.in **a. Group A, B & C on 10/ 05/ 2024 at 15.00** hours **b. Group D, E & F on 13/ 05/ 2024 at 15.00** hours **c. Group G on 14/ 05/ 2024 at 15.00** hours **d. Group H, I, J & K on 15/ 05/ 2024 at 15.00** hours
8.	**Date, Time and Place of opening of price bid**	:	Date & Time will be communicated later on subsequent to acceptance of techno- commercial bid at www.eproc2.bihar.gov.in

INDIRA GANDHI INSTITUTE OF MEDICAL SCIENCES,

SHEIKHPURA, PATNA -800014 (Bihar, India)

Sr. No. of Tender: _____

FILE NO. : Tender No.: _____

Tender form issued in favour of: _____

Dear Sir,

1. I/We hereby submit our tender for the _____

2. I/We are enclosing herewith the Demand Draft No…… dated…….…… for **Rs.** **/-** drawn in favourof **Director I.G.I.M.S. - Patna (payable at Patna)** towards **EMD / Bid Security.**

   (EMD AND COST OF BIDDING DOCUMENTS MUST BE SUBMIITED IN SEPRATE ENVELOP.TENDERS NOT ACCOMPANIED WITH EMD / BIDSECURITY ALONGWITH THE TECHNO-COMMERCIAL BID SHALL BE SUMMARILY REJECTED).

3. I/We have gone through all terms and conditions of the tender documents before submitting the same.

4. I/We hereby agree to all the terms and conditions, stipulated by the I.G.I.M.S. - Patna including delivery, warranty, penalty etc. Quotations for each group are being submitted under separate covers, and sheets and shall be considered on their face value.

5. I/We have noted that overwritten entries shall be deleted unless duly cut & rewritten and initialled.

6. Tenders are duly signed and stamped (No thumb impression should be affixed).

7. I/We undertake to sign the contract/agreement, if required, within 15 (Fifteen days) from the date of issue of the letter of acceptance, failing which our/my EMD/Bid deposited may be forfeited and our/my name may be removed from the list of suppliers.

8. **I/we have quoted the price in Indian Rupee only.**

Yours faithfully,

(Signature of Bidder with full name and address)

CHECK LIST FOR TERMS AND CONDITIONS

A.: **To be filled by the bidder and submitted along with the Technical Bid.**

Sr. No.	Terms & Conditions as per Bidding Document	Page No. (Please mention the page nos. of the technical bid where the concerned document is attached)	Remarks
1.	**Status of Bidder:** • Manufacturer or Authorized Agent of the Manufacturer • Whether Public Undertaking, Public Ltd., Private Ltd. Company or Proprietary Firm/partnership firm (Please attach Notary certified **MANUFACTURER'S AUTHORISATION FORM as per FORMAT placed at Annexure – III)**		
2.	**Power of Attorney as per Annexure - V** in favour of person to sign, submit and negotiate the bid.		
3.	Certificate towards market standing of minimum 05 years in the area of supply and or maintenance of bio-medical equipment's.		
4.	Certificate for sole ownership / partnership		
5.	Statement of financial standing from bankers		
6.	Statements of turnover per year for last three successive years duly certified by the Chartered Accountants.		
7.	**Notary certified User List** (List of Govt./Semi Govt., Reputed Pvt. Hospital) where quoted model of the items has been supplied and installed.		
8.	**Notary certified Supply** order copy (Minimum 3nos. or more) issued by Govt. /Semi Govt. /Reputed Pvt. Institutions/organization for the quoted items. (same model)		
9.	**Notary certified Performance certificate** of the same supplied machine (of quoted make and Model) issued by **Head of the dept. or Institution** after a minimum period of six months of installation		
10.	Prerequisite (if any) for installation of the Machine, if any, to be provided by the Institute.		
11.	Whether rates quoted are inclusive of all taxes or not.		
12.	Whether rates are quoted as per format mentioned in the Bidding Document or not.		
13.	Affidavit to the effect that the bidder is not blacklisted by any Govt. agency or has no pending case either Civil or Criminal against them.		
14.	Affidavit, to the effect that the bidder is not supplying the quoted item(s) to any other Govt. /Semi Govt. Organizations / Institutions / Hospitals at the rate lower than the rate quoted against this tender.		
15.	**Quality Assurance Certificate** like **ISI, ISO-9002, IP/BP, ICMED 9001/ ICMED 13485/ICMED 13485 Plus/CE/USAFDA/QCI** or any other (please specify)		
16.	**Bid Security** amount deposited is enclosed or not. If yes, please mention the details.		
17.	**Original Technical Catalogue** of the quoted model.		

18.	Certificate, to the effect that bidder will maintain the quoted item(s) during Warranty period of five years as mentioned against each item including all spares, accessories, consumables etc., (Please mention the name of the item / items with price, which are not supplied by the bidder free of cost with frequency of replacement)		
19.	Certificate, to the effect that bidder has quoted its rate for Comprehensive Annual Maintenance Contract inclusive of labour, spares, consumables, accessories etc. on per year basis for a further period of five years after expiry of warranty period of five years in the **price bid**. (Please mention the name of the item / items with price, which are not supplied by the bidder free of cost with frequency of replacement during Comprehensive Annual Maintenance Contract period in the price bid)		
20.	Acceptance of all terms / conditions towards **after sales / services** as mentioned in the bidding document. (Clause No- 13 of " Instruction to Bidder " & clause no- 3, 4 and 5 of Condition of contract.)		
21.	**Compliance Statement** with relation to the technical specification as mentioned in the bidding document duly supported by the original catalogue. The bidder must quote specification in the compliance column Mere writing" Complied shall not be accepted.		
22.	**Compliance Statement** with relation to the terms & conditions as mentioned in the document.		
23.	**PAN and copies of Income Tax Returns** for the last three years.		
24.	Duly attested copy of GST registration certificate.		

B: To be filled by the Bidder and submitted along with Price Bid

Sl. No.	Terms & Conditions as per Bidding Document	Page No.	Remarks
1.	**Item wise price in Indian Currency for the item(s)** as mentioned in the Bidding Document and as per format attached as **Annexure – I**		
2.	**Rate for Comprehensive Annual Maintenance Contract** as per terms & conditions mentioned in the Bidding Document and as per format attached as **Annexure - II**		

Note: **If the above tender details are not mentioned and required documents are not attached at appropriate places, the offer of the bidder(s) shall be summarily rejected. Hence, bidder(s) are advised to go through the bidding document carefully and tender be prepared with all the required documents to avoid rejection of offer and price should be mentioned in Indian Rupees.**

(Name of the Bidder with signature & seal)

ELIGIBILITY CRITERIA

Sl. No.	Descrption	Page No. (Please note that the page numbers must be mentioned.)
01	Manufacturers or their authorized dealers / Indian subsidiaries / direct importers having a place of business in any of the States of India are eligible to participate in this tender.	
02	The bidder and manufacturer of the equipment offered should be in the business of the supply and installation of same / similar equipment for the last five calendar years.	
	(a)The manufacturer should have completed at least 05(Five) nos. installations of the quoted items in Govt. /Pvt. Institutions /Hospitals in India. The installations mentioned by the manufacturer in their offer must be functional and performance certificate for the same issued by the user concerned also be attached with the offer. (b) The bids quoted as the authorized representative of the manufacturer meeting the above criteria 02 (a) should have also supplied and installed at least 03(Three) nos. installations of the quoted items in Govt. Institutions/ Hospitals in India in last five years from the last date of submission of tender. The installations mentioned by the authorized representative in their offer must be functional and performance certificate for the same issued by the user concerned also be attached with the offer.	
03	The Bidder should be public undertaking /Autonomous Body /Public Ltd./Pvt. Ltd. Company or proprietary firm /Partnership Firm and should be in medical equipment business since last five years in India. The Bidders having manufacturing facility in their name in India for the majority of the items offered by them shall be given preference.	
04	The Bidder (manufacturer or their authorized agent) should have had average annual financial turnover of Rs. 50 Lakh during the last three years endings 31st March 2023.	
05	Bidders who have the capability to attend repairs of these equipment within the time mentioned in this bidding document and who are willing to provide stand by equipment or replace the faulty equipment if the repair/down time extends beyond 72 hours from the time of reporting of the fault within the next 48 hours (total down time should not exceed 5 days in one instance). The bidders who have the capability to ensure the uptime mentioned in this document (Documentary proof shall be submitted on the after sales facilities and expertise of the bidder.)	
06	Bidders are not offering the equipment of a firm /company that has been blacklisted by Indira Gandhi Institute of Medical Sciences – Patna or blacklisted/debarred by any other State / Central Government's organization.	

Note:

- Notwithstanding anything stated above, the Institute reserves the right to assess the Bidder's capability and capacity to perform the contract satisfactorily before deciding on award of contract, should circumstances warrant such an assessment in the overall interest of the purchaser.
- The Institute reserves the right to ask for a free demonstration of the quoted equipment at a pre-determined place acceptable to the purchaser of technical acceptability as per the tender specification, before the opening of the price tender.

INSTRUCTION TO BIDDER

GENERAL INSTRUCTIONS T0 BIDDERS

1. **Tendering System**

The tenders/Bids are to be submitted in two Parts i.e. **Part - I & Part II**.

PART - I titled as TECHNICAL BID shall contain the complete technical specifications and details on the competencyofthebidderandalsothecommercial bid package with terms and conditions of supply, warranty, after sales service etc. (Except Price Bid Form). Apart from the documents and signed copy of the purchased tender document, the necessary enclosures should be submitted in this technical bid. In short, the technical bid should contain all the necessary documents to prove the technical competency and capability of the bidders for supplying and installing a trouble free equipment meeting the quality standards and technical specification and the ability of the bidders for providing efficient after sales service to the satisfaction of the Tender Inviting Authority and the user institution.

PART - II titled as PRICE BID

2. The tender offers, duly filled, shall be submitted in sealed covers for **technical**. Such covers shall be super scribed as **"Tender No……. (here mention the tender no as specified) TECHNICAL BID for supply of ……..... (here mention the name of the equipment**

3. Quantity of items may increase or decrease. Director, I.G.I.M.S. - Patna reserves the rights to purchase different sub items/ components of items from different bidders.

4. The "Bidding Document" along with terms and conditions, technical specification can be obtained from the office of the Store Officer, IGIMS, Patna on payment of **Rs.2500/-(Rs. Twenty fivehundred only)** Non –refundable for each Group by demand draft favouring Director, IGIMS, Patna payable at Patna.

5. The "Bidding Document" can also be downloaded from institute website www.igims.org. In case, downloaded bidding document is used, Bidder(s) have to submit the cost of the Tender Document along with the completed documents in the form of demand draft in favour of Director, IGIMS, Patna, payable at Patna towards cost of the "Tender documents" Bidder is required to attach separate DD for the same in a separate envelop super scribed with "cost of bidding document" if the cost of tender document is not submitted by the bidder, his offer shall be outright rejected.

6. **Last datefor submission of bidding document is 08/ 05/ 2024 up to 4.00PM by speed/Regd. post/ Courier services only and technical bid will be opened on 10/ 05/ 2024, 13/ 05/ 2024, 14/ 05/ 2024 & 15.05.2024 at 1.00 PM in Ground Floor, Admnistrative Building Conference Hall of IGIMS, Patna.**

7. **Earnest Money Deposit (EMD):**

Earnest Money 2% of the cost of Equipment required to be submitted along with tender by Demand Draft from any scheduled Indian Bank only along with the tender favouring Director, I.G.I.M.S. – Patna (payable at Patna). No interest is payable on EMD/ Bid security.

a. Bidder may quote more than one/several models. In such a situation EMD will be payable on the basis of highest priced model.

b. EMD of the unsuccessful bidders will be returned to them at the earliest after expiry of final bid validity and latest on or before the 30th day after the award of the contract without any interest.

c. EMD must be submitted in separate sealed envelope and endorsement of the same with DD number & date Bank Guarantee No. and its validity period be made with technical bids without amount stating that the same has been complied with price bid. If same is later found not enclosed tender will be cancelled for the party.

d. Non- submission of sufficient EMD along with the Technical Bid shall be one of the primary reasons for rejection of the offer in the first round**.**

e. Cheque, Cash payment, Money Order, Fixed deposit etc will not be accepted as EMD.

f. Public Sector Units within the State or State micro, small and medium enterprises registered with Govt. are exempted from remittance of EMD subject to submission of valid documents.

g. The EMD shall be in one of the following forms:

i. A demand draft in favour of Director, I.G.I.M.S. – Patna (payable at Patna);

OR

ii. A Bank Guarantee issued by a nationalized/ scheduled bank located in India, in the form prescribed in the tender document as Annexure- IV (valid up to one year from the date of technical bids opening) Bank Guarantee in any other format will not be acceptable and render the bid non-responsive.

iii. The successful Bidder's EMD will be discharged upon the Bidders signing the contract and furnishing the performance security. The EMD deposited in the form of DD of the successful Bidder can be adjusted towards the security deposit payable.

8. Bidder(s) should enclosed photocopy of Income tax clearance certificate.

9. The Bidder's shall have to submit the following documents (Certified by Notary) in technical bid:

a. User List (List of Govt. / Semi Govt., Reputed Pvt. Hospital) where quoted model of the items has been supplied and installed.

b. Supply order (minimum 3 nos. or more issued by Govt./ Semi Govt. / reputed Pvt. Institution / Organisation for quoted items (same model)

c. Performance certificate of the same supplied machine (of quoted Make and Model) issued by **Head of the department or Institution** after a minimum period of six months of installation.

d. Prerequisite (if any) for installation of the Machine if any to be provided by the Institute.

e. If the manufacturing company and/or its Indian agent (for Foreign manufactured) have authorized some agency for participation in this tender for a limited period than in that case they (Manufacturer / Indian agent) shall have to submit an undertaking duly notarized by Public notary that if their tender is selected they shall be solely responsible for compliance of all the terms and conditions mentioned in the bilateral agreement for purchase and subsequent supply order even if their authorized agent is changed. Any tender offer without such certificate duly certified by public notary shall be rejected in technical scrutiny itself.

f. **Bidder must submit a compliance checklist along with the technical bid itself.**

g. Any tender offer without submission of above mentioned document (**i.e. a to e**) shall be rejected during technical scrutiny**.**

h. If any new System/ Latest model machine is a launched in the market and seller has not installed such quoted models they should submit an undertaking that he has not installed such models previously (Notarized by Public Notary).They may submit supply order / performance certificate of previous model, which was recently installed by them.

10. Installation & site plan:-

Requirement regarding site/location etc. for installation of equipment, if any, should be mentioned in the tender. Time required for installation of system after delivery must be mentioned. In case of delay in installation institute will have right to charge liquidated damage. Specify the following points for installation of the System: -

a. Total power consumption along with break up of main System and Accessories.

b. Whether the System needs uninterrupted power supply where ever applicable.

c. Maximum tolerated transfer time in case of interruption of power supply.

d. Whether the System needs any humidity control device.

e. Whether the System needs any separate power line/isolation Transformer.

f. Does the System need the electrical shielding?

g. Does it require special civil works for installation?

h. Whether Air conditioner is an essential requirement for the system.

i. Does it require any special civil works for Installation?

11. <u>After Sales Service Conditions</u>:

a. The Institute is in the pursuit of ensuring excellent after sales service for every user in respect of the equipment's supplied under this contract. The after sales services terms and conditions will be strictly enforced and those Bidders who are willing to support the Institute in its endeavour to provide trouble free operation/performance of the equipment's for the prescribed period need only participate in the tender.

b. The after sales service shall be performed during the warranty period and also during the Comprehensive Maintenance Period (CMC)/ Annual Maintenance Contract, if awarded. The detailed terms and conditions for after sales service are mentioned hereunder.

c. <u>Guarantee/Warranty Terms</u>:

i. The successful Bidder has to warrant that the Goods supplied under this Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

ii. The successful Bidder further have to warrant that the Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except when the design and/or material is required by the Tender Inviting Authority's specifications) or from any act or omission of the successful Bidder, that may develop under normal use of the supplied goods.

iii. All the equipment's including the accessories supplied as per the technical specification as mentioned in the bidding document should carry comprehensive warranty (including all spares, accessories and consumables) for a period mentioned in this document in the first instance. During this period, the successful Bidder shall replace all defective parts / accessories / consumables and attend to all repairs/break downs and undertake stipulated number of preventive maintenance visits to every user installation site. The cost of spare parts for all replacements has to be borne by the successful Bidder during the period of comprehensive warranty. The items which are not covered under warranty should be clearly mentioned along with rate of the items . If any spares / accessories / consumables etc. are not replaced by the bidder during warranty period, bidder should mention it clearly with name of the items with frequency of replacement and its rate of the item.

iv. On expiration of the comprehensive warranty period, the successful Bidder shall be willing to provide after sales support for an additional period prescribed in this document.

v. The prospective Bidder, who are not manufacturers, shall submit an undertaking from the Original Equipment Manufacturers (OEM) that they are willing to provide spare parts for

the period of warranty as mentioned and also during the additional CMC/AMC period, if awarded. The OEM shall also assure continuity of service to their product, in the event of change in dealership or the Bidders – their existing dealers - couldn't provide service during the warranty / CAMC period. The undertaking from OEM is an essential document forming part of the Technical Bid, without which the tenders will be rejected summarily in the first round itself.

vi. After sales service centre in Patna (Bihar) preferably or at least in East India should be available as part of the pre-qualification and the Bidder shall provide proof of their capability to undertake such maintenance/repair within the stipulated time.

vii. The successful Bidder shall provide preventive maintenance as per the frequency mentioned in this document during the warranty period. The Bidder shall attend any number of break down/repair calls as and when informed by the institute authority.

viii. Upon receipt of such notice for repair/breakdown from the institute, the successful Bidder shall, within the period as specified in this document, and with all reasonable speed, repair or replace the defective goods or parts thereof, without cost to the Tender Inviting Authority.

ix. If the successful Bidder, having been notified, fails to rectify the defect(s) within the period specified mentioned in this document, the Tender Inviting Authority may proceed to take such remedial action as may be deemed necessary, at the successful Bidder's risk and cost and without prejudice to any other rights which the Tender Inviting Authority may have against the successful Bidder under the contract.

x. Failure to attend the repairs in time or failure to attend the stipulated preventive maintenance visit or failure to replace the defective equipment's or to provide stand by equipment if the fault/down time exceeds the stipulated period or to ensure the stipulated up-time in an year shall lead to forfeiture of the performance security and/or may lead to blacklisting/debarring of the defaulting Bidder.

xi. The equipment which requires quality assurance test shall be done at free of cost immediately after installation, during the comprehensive warranty period, during the CMC/AMC period, by the demand of User and also when major spares are replaced.

xii. Any mandatory approval required for installation shall be obtained by the successful Bidder in liaison with the respective authorities.

xiii. The Bidder shall submit the parameters which require calibration and the frequency of calibration required.

xiv. The Bidder shall undertake on-site calibration of the equipment every year as part of the after sales service during the period of comprehensive warranty, CMC/AMC or on demand from the user.

xv. The Bidders shall also have to submit whether periodic replacements of consumable items are required for proper functioning of their quoted machine/Equipment? If yes they should submit the list of such consumables along with price list and frequency of replacement per year, if the same is not replaced free of cost during warranty / guarantee period.

xvi. An undertaking of the principal regarding continuity of after sales and services (CAMC) @ the agreement rate even in case of changes of Indian agent during the life span of the equipment, must be enclosed in the technical bid. Further, it will be the responsibility of the manufacturer Indian agent to get counter signature on the agreement to be executed with them by the principal.

xvii. The offered warranty includes:

- Visits to the user institutions at frequencies prescribed as part of preventive maintenance.

- Testing & calibration as per technical/service/operation manual of the manufacturer or as per the period specified or as per the demand of the user.

- Quality Assurance tests (if applicable).

- The cost of labour for all repairs/ and all spares required for replacement during repairs all kinds of accessories, Probes, all types of sensors and transducers, Electrodes, Detectors, battery, battery for UPS, other vaccumatic parts etc wherever applicable and also the accessories and other devices supplied along with the equipments like stabilizer, UPS, AC, Computer, Compressor, Monitor, etc, which forms part of the equipment system, without which it cannot perform satisfactorily.
- The exclusion of warranty of any vital equipment parts will be compared with offers of other Bidders during evaluation of the bids and this may be taken into consideration in deciding the successful Bidder on the basis of expert advice.

- The Bidder shall provide up-time warranty of complete equipment as mentioned in this document, the uptime being calculated on 24 (hrs) X 7 (days) basis failing Warranty period will be extended for every additional day of down time equal to one week.

- All software updates, if any required, should be provided free of cost during Warranty period.

d. <u>Comprehensive Annual Maintenance Contract</u>:

- The decision to enter into CMC or AMC will be determined on the basis of cost and complexity of the equipment by the Tender Inviting Authority, at its discretion, prior to the expiration of warranty period.

- The Comprehensive Maintenance Contract (CMC) is otherwise an extended warranty. All the terms and conditions agreed by the successful Bidder for executing the comprehensive warranty of the equipment shall be extended during the period of CMC, only difference being the payment of CMC charges is absent during the period of comprehensive warranty.

- The cost of CMC, accessories spares, and consumables as in case may be quoted along with taxes applicable, if any. The taxes to be paid extra, to be specifically indicated. In the absence of any such stipulation the price will be taken inclusive of such taxes and no claim for the same will be entertained later.

- Failure/refusal on the part of the successful tender supplying/installing the equipment's to enter into CMC with the Tender Inviting Authority, at the end of the Comprehensive Warranty Period, if the Institute, as the case may be, desires so, shall lead to forfeiture of performance security and may also result in the blacklisting/debarring of the Bidder.

- The successful Bidder shall also indicate the rates for the CMC in price bid form and such rates are binding on the successful tenders after the expiration of the warranty period. The yearly rates for CMC shall remain the one and the same as quoted in the price bid form for the extended years.

- Cost of CMC (excluding taxes, if any) will be considered for Ranking/Evaluation purpose.

- The payment of the agreed CMC charges will be made as per frequency for payment after satisfactory completion of said period, on receipt of service report/ break down report from the user.

- The Bidder shall also have to submit whether periodic replacement of consumable items is required for proper functioning of their quoted machine/Equipment? If yes they should submit the list of such consumables along with price list and frequency of replacement per year if the same is not included in quoted Comprehensive Annual Maintenance Contract charges per year.

12. <u>Time Limits prescribed</u>

Sl. No.	Activity	Time Limit
a.	Installation & Delivery period	12 weeks from date of issuance of

		Supply Order
b.	Comprehensive warranty period	5 years from the date of successful installation.
c.	CMC period	5 years
d.	Frequency of visits to all User Institution concerned during Warranty/CMC	One visit every three months (4 visits in a year) for periodic/preventive maintenance and any time for attending repairs/break down calls.
e.	Frequency of payment of CMC charges	Every six months after completion of thePeriod.
f.	Submission of Performance Security and entering into contract	10 days from the date of issuance of Letter of Intent
g.	Maximum time to attend any Repair call	Within 24 hours.
h.	Uptime in a year during warranty as well as during CAMC period.	95% of 365 days.

13. Firm have to provide a minimum **UPTIME GUARANTEE** of 95% (95% of 365 Days) per year during the warranty period as well as during the Comprehensive Annual Maintenance Contract.

14. **While calculating the total unit price of the item / system to be procured, expenditure to be incurred in maintenance of the quoted item / system including all spare parts for a total period of five years after expiry of the warranty period of five years shall also be taken into consideration. Accordingly, it is mandatory for the bidders to submit the rate for Comprehensive Annual Maintenance Contract (with spares) for a minimum period of five years after the expiry of warranty period of five years.**

15. Supplier will submit undertaking for ensuring uninterrupted supply of spares during the total life span of the equipment's.

16. Indian agency commission and Installation charge if any will be paid in Indian rupees after successful installation and demonstration of the equipment's.

17. Principal's Invoice of the quoted items must be submitted with the quotations.

18. Proof of the official Indian agent certificate of the firm must be attached. (Notary Certified Photocopy)

19. In order to fully and optimally utilize the equipment, training to Para Medical Staffs and Doctors should be provided. In continuation to this training, separatemaintenance training for the machine and the sub systems should also be given to the "Equipment Maintenance Engineer" and "Equipment Maintenance Technicians". All the financial commitments in this regard shall be met by the bidder(s).

20. Bidder(s) have to submit an affidavit to the effect that they have not supplied the offered item(s) to any Govt., semi Govt. /Organization, Institution, etc. at the price lower than the price offered to I.G.I.M.S. – Patna.

21. All the claims regarding meeting the specifications shall be duly supported by appropriate, latest technical catalogues/brochures from the manufacturer. Simply stating that the equipment(s) meets the specifications is not sufficient and any such quotations will be summarily rejected. Computer printed documents or Photostat copy or laser printouts will not be accepted as technical catalogues / brochures.

22. Bidder might be required to demonstrate the system at the discretion of the institute.

23. **Notification of Award/Letter of Intent (LOI)**

a. Before expiry of the tender validity period, the Institute will notify the successful Bidder(s) in writing, by registered / speed post or by fax or by email (to be confirmed by registered / speed post immediately afterwards) that its tender for equipment(s), which have been selected by the Institute, has been accepted, also briefly indicating there in the essential details like description, specification and quantity of the goods & services and corresponding prices accepted. This

notification is undertaken by issuing a Letter of Intent (LOI) by the Institute.

b. The successful bidder, upon receipt of the LOI, shall furnish the required performance security and submit an agreement in the prescribed format within ten days, failing which the EMD will forfeited and the award will be cancelled.

c. The Notification of Award shall constitute the conclusion of the Contract.

24. Signing of Contract

The successful bidder shall execute an agreement for ensuring satisfactory supply, installation, commissioning and the after sales service/support during the warranty period and during the Comprehensive Annual Maintenance Contract.

25. The Director reserves the right to accept or reject any or all tenders without assigning reasons.

26. The Director reserves the right to modify, add or delete any terms & conditions of the contract as and when required.

27. Amendment of tender documents:

a. At any time prior to the dead line for submission of Tender, the Institute may, for any reason, modify the tender document by amendment.

b. The amendment shall be notified and uploaded on the institute website www.igims.org only and such amendments shall be binding on them thereafter.

c. The Institute shall not be responsible for failure to inform the prospective bidders. Purchasers of tender documents are requested to browse the website of the Institute for information/general notices/amendments to tender document etc on a day to day basis till the tender is concluded.

28. The Dispute, if any, will be subject to Jurisdiction at Patna (Bihar).

Sd/-
Director,
I.G.I.M.S. – Patna

CONDITIONS OF THE CONTRACT

1. **Duty Free Clearance, Transportation, Forwarding & Handling Charges**:

   Clearance charges at point of Entry / Air Port and on ward transportation charges with Insurance up to I.G.I.M.S. – Patna will be borne by supplier's Indian Agent for which this Institute will not pay the charges. The firm should quote as FOR IGIMS Patna including all expenditure in **Indian Rupees only**.

2. **Demurrage. Taxes &Octroi:-**

   No demurrage charges will be paid by the Institute in case of delay on the part of supplier. However, this Institute will provide all necessary documents required for clearance / transportation of the goods and for exemption of the taxes/octroi for which supplier/Indian agent will have to intimate/furnish his requisition of document required, if any, well in advance. Octroi will be payable by supplier / Indian agent, if required.

3. **Warranty Period**:

   a. The "**Complete System**" shall remain under warranty period of **five years** from the date of satisfactory installation. The Complete System should include the basic unit and allied supporting components like UPS etc. to be supplied by the bidder along with basic unit if necessary for running the system.

   b. During warranty period of five years, bidder shall provide at least **four maintenance visits per year** at regular interval for usual maintenance and supervision. If bidder fails to provide these maintenance visits at regular interval, a proportionate deduction in the form of penalty on pro-rata basis will be recovered from the bidder from the Bank Guarantee amount. In case the Bank Guarantee is not adequate, Institute shall have right to recover the losses / penalty from other sources as well.

   c. Bidder shall also attend all breakdown calls within 48 hours of the receipt of the information from institute through fax/e-mail/mobile/sms etc.

   d. During warranty period, **bidder** shall maintain and keep **95% uptime** per year of the"**CompleteSystem**"as per calculation given below:-.

   1 Year = 365days
   95% of 365 days = 347 Days per annum

   e. The bidder shall compensate the uptime less than the specified above for **every additional day** of down time over and above 18 days stipulated above, warranty period will get extended by one week as penalty at no extra cost i.e. the extended penalty period will be equal to one week for every additional day of down time.

   f. During warranty period, **bidder** will make the "**Complete System**" in satisfactory working condition. In case, any spare parts, accessories, PCB, consumables etc. needs replacement due to normal wear and tear, **bidder** will supply and install the same for which no additional payment is to be made with validity to cover warranty period if required.

   g. In case, the **bidder** is not able to provide services (and the items / accessories is not functioning as the reason thereof) due to natural calamity (act of God), Political unrest, Riot and fire at the user site, then in such a situation the warranty period will be extended by the period for which the item / accessories could not be operated because of supplier not been able to provide services.

   h. During warranty period, in case of any alleged damage due to accident / human error, a committee under the Chairmanship of Director, I.G.I.M.S. – Patna with one member from the bidder and one member from the Institute will decide the authenticity of the claim. The decision of the committee shall be final and biding on both the parties.

4. **After Sales Services**: -

a. After expiry of the warrantee/Guarantee period of the equipment, the Indian agent will have to undertake the Comprehensive Annual Maintenance contract (with spare parts, accessories, consumables etc.) of the Complete System for the further life span of equipment. The life span of the equipment shall not be less than ten years. In special circumstances the total life span of the Equipment/ items may be reduced by the Institute.

b. The Complete System should include the basic unit and allied supporting components like UPS, Stabilizer, etc to be supplied by the bidder along with basic unit if necessary for running the system.

d. During Comprehensive Annual Maintenance Contract, bidder shall provide at least **four maintenance visits per year** at regular interval for usual maintenance and supervision. If bidder fails to provide these maintenance visits at regular interval per year, a proportionate deduction in the form of penalty at the rate of 25% of contract amount per year will be deducted.

e. Bidder shall also attend all breakdown calls within 48 hours of the receipt of the information from institute through fax/e-mail/mobile/sms etc.

a. During Comprehensive Annual Maintenance Contract, **bidder** shall maintain and keep **95% uptime** per year of the"**CompleteSystem**"as per calculation given below:-.

1 Year = 365days
95% of 365 days = 347 Days per annum

f. The bidder shall compensate the uptime less than the specified above for **every additional day** of down time over and above 18 days stipulated above, warranty period will get extended by one week as penalty at no extra cost i.e. the extended penalty period will be equal to one week for every additional day of down time.

g. During Comprehensive Annual Maintenance Contract, **bidder** will keep the "**Complete System**" in satisfactory working condition. In case, any spare parts, accessories, PCB, all type of consumables etc. needs replacement due to normal wear and tear, **bidder** will supply and install the same for which no additional payment is to be made. .If any spares / consumables / accessories etc. are not covered under Comprehensive Annual Maintenance Contract charges, it should be clearly mentioned with frequency of replacement and with rate. The validity of rate of such items should also be mentioned clearly. What will be the rate of escalation on the quoted rate after expiry of the validity of rate of such item must be mentioned.

h. The payment of Comprehensive Annual Maintenance Contract will be made on half yearly basis after submission of satisfactory functioning report of the Complete System by the officials authorized by the Institute.

i. In case, the **bidder** is not able to provide services (and the items / accessories is not functioning as the reason thereof) due to natural calamity (act of God), Political unrest, Riot and fire at the user site, then in such a situation the Comprehensive Annual Maintenance Contract will be extended by the period for which the item / accessories could not be operated because of supplier not being able to provide services.

j. During Comprehensive Annual Maintenance Contract, in case of any alleged damage due to accident / human error, a committee under the Chairmanship of Director, I.G.I.M.S. – Patna with one member from the bidder and one member from the Institute will decide the authenticity of the claim. The decision of the committee shall be final and biding on both the parties.

5. **Performance Security**

a. There will be a security deposit amounting to 10 % of the total value of the equipment excluding taxes, which shall be submitted by the successful bidder within 10 days from the date of issuance of "Letter of Intent".

b. The contract duly signed and returned to the Institute shall be accompanied by a demand Draft or Bank Guarantee in the prescribed format.

b. Upon receipt of such contract and the security money deposit, the Institute shall issue the Supply Orders containing the terms and conditions for the execution of the order.

c. Failure of the successful bidder in providing security money deposit as mentioned above and / or in returning contract copy duly signed in time shall make the bidder liable for forfeiture of its EMD.

e. The Performance security shall be denominated in Indian Rupees or in the currency of the contract as detailed below:

i. It shall be in any one of the forms namely Account Payee Demand Draft or Bank Guarantee issued by a Scheduled bank in India, in the prescribed form as provided in this document endorsed in favour of the Institute.

ii. Institute will release the security money deposit without any interest to the successful bidder on completion of the successful bidder's all contractual obligations including the warranty obligations & after receipt of certificates confirming that all the contractual obligations have been successfully complied with.

d. <u>Delivery period/Liquidated Damage</u>: -

Goods should be delivered within three months after receipt of Supply Order. If the delivery is not affected by due date, the Director, I.G.I.M.S. – Patna shall have the right to charge liquidated damage on supplier/his Indian agent as under: -

i. 1st extension for a month or a part thereof @ 2% per month.

ii. 2nd extension for an additional month or a part thereof @ 3% per month subject to maximum Limit of 20% of the order items.

iii. Cancellation: If delivery is not done even after2nd extension Institute shall have the right of cancellation of Supply order at its discretion. The institute may also cancel the supply order without giving any extension.

e. <u>Payment</u>:-

90% payment will be released against delivery and successful installation of the equipment & balance 10% will be released on submission of 10 % Bank Guarantee of the total cost of ordered value. This Bank Guarantee will be released after expiry of guarantee period.

f. **<u>Validity of Price:-</u>**

This rate Contract will be valid for Two year from date of 1st satisfactory installation and acceptance of the equipment. Repeat Supply Order will be placed as per requirement of the Institute of all the quoted and approved items. The rate contract may be further extended for period of one year as decided by Director, IGIMS-Patna.

9. **<u>Part Supply</u>**:

No part supply/ wrong supply or short supply will be accepted by the Institute. The Director IGIMS, Patna will be the final authority and will have the right to reject full or any part of supply, which is contradictory to the terms and conditions agreed at the time of placement of order. In case of rejection of any supplied items due to nonconformity in quantity and/or quality, Institute will have right to charge liquidated damages, as it deems fit.

10. <u>Packing &Marking:-</u>

Goods must be securely and adequately packed and protected in order to prevent damage, otherwise all losses and /or damage resulting from inadequate packing and/or inadequate protection or inadequate marking shall be borne by seller/seller's Principal abroad.

11. Supplier may have to provide required manpower for running the equipments at mutually agreed remuneration (Which shall not be more than remuneration payable for the particular category of staff at IGIMS) at the sole discretion of the Institute, till institute is able to arrange its own staff for the purpose.

12. Insurance: -

Insurance up to Patna will be borne / arranged by principal supplier / his Indian Agent.

g. Installation & site plan:

Requirement regarding site/location for installation of equipment, if any, should be mentioned in the tender. Time required for installation of system after delivery must be mentioned. In case of delay in installation institute will have right to charge liquidated damage.

Specify the following points for installation of the System: -

a. Total power consumption along with breakup of main System and Accessories.
b. Whether the System needs uninterrupted power supply.
c. Maximum tolerated transfer time in case of interruption of power supply.
d. Whether the System needs any humidity control device.
e. Whether the System needs any separate power line/isolation Transformer.
f. Does the System need the electrical shielding?
g. Whether Air Conditioner is required for the System.
h. Does it require special civil works for installation?

14. The bidder should also quote for supply of "Un-Interrupted Power Supply" (UPS) with a battery backup of at least 30 minutes, **"**Constant Voltage Transformer (CVT)" of reputed manufacturer of required capacity along with Spike Suppressor or "Servo Voltage Stabilizer" as per requirement of the System. Bidder may quote the prices for all the above items (UPS/CVT/SERVO VOLTAGE STABILIZER) and the decision will be taken during technical evaluation of the item whether UPS is suitable or CVT / Servo Voltage Stabilizer will serve the purpose.

15. Responsibility:-

The principal as well as its agent will be severally and jointly responsible for ensuring the minimum life span of 10 years for the equipment. Both the said principal abroad and his Indian agent will have the full responsibility for the proper functioning of the equipment/instruments within the warrantee period and thereafter during the life span of the equipment

16. The bidder is required to provide list of persons (along with their permanent and correspondence address) owing more than 1% share ownership in the company/firm (both principle and Indian Agent).

17. The bidder is required to submit compliance sheet, which should reflect details of clause-by-clause compliance of technical specifications as well as general terms & conditions failing which their offer shall be rejected.

18. In order to fully and optimally utilize the equipment, training to paramedical staff and Doctors should be provided. In continuation to this training separate maintenance training for the machine and the sub system should also be given to the Equipment Maintenance Engineer and Maintenance Technicians of the Institute. All the financial commitment in this regard shall be met by the firm/Principal.

19. Penalties for non-performance

The penalties to be imposed, at any stage, under this tender are:

a. Imposition of liquidated damages,

b. Forfeiture of EMD/ Security money deposit,
c. Termination of the contract,
d. Blacklisting/debarring of the bidder.

20. Termination of Contract

a. Termination for default: The Institute, without prejudice to any other contractual rights and remedies available to it (the Institute), may, by written notice of default sent to the successful bidder, terminate the contract in whole or in part, if the successful Bidder fails to deliver any or all of the goods or fails to perform any other contractual obligation(s) within the time period specified in the contract, or within any extension thereof granted by the Institute.

h. In the event of the Institute terminates the contract in whole or in part, the Institute may procure goods and/or services similar to those cancelled, with such terms and conditions and in such manner as it deems fit and the successful bidder shall be liable to the Institute for the extra expenditure, if any, incurred by the Institute for arranging such procurement.

i. Unless otherwise instructed by the Institute, the successful bidder shall continue to perform the contract to the extent not terminated.

j. Termination for insolvency: If the successful bidder becomes bankrupt or otherwise insolvent, the Institute reserves the right to terminate the contract at any time, by serving written notice to the successful bidder without any compensation, whatsoever, to the successful Bidder, subject to further condition that such termination will not prejudice or affect the rights and remedies which have accrued and / or will accrue thereafter to the Institute.

k. Termination for convenience: - The Institute reserves the right to terminate the contract, in whole or in part for its (Institute) convenience, by serving written notice on the successful bidder at any time during the currency of the contract. The notice shall specify that the termination is for the convenience of the Institute. The notice shall also indicate interalia, the extent to which the successful bidder's performance under the contract is terminated, and the date with effect from which such termination will become effective.

21. Fall Clause:

The prices charged for the equipment supplies under the contract by successful bidder shall in no event exceed the lowest price at which the successful bidder sells the equipment's of identical description to any other persons during the period of contract. If any time, during the contract, the bidder reduces the sales price chargeable under the contract, he shall forth with notify such reduction to the Institute and the price payable under the contract of the equipment'ssupplied after the date of coming into force of such reduction or sale shall stand correspondingly reduced.

22. Applicable Law & Jurisdiction of Courts

a. The contract shall be governed by and interpreted in accordance with the laws of India for the time being in force.

l. All disputes arising out of this tender will be subject to the jurisdiction of courts of law in Patna (Bihar, India).

Sd/-
Director,
IGIMS - Patna.

SCHEDULE OF THE REQUIREMENT

List of Equipment's
Group A: Anaesthesiology
Flowtrac Cardiac Output Monitoring
Trans Oesophageal Echocardiography
CRRT Machine
ECMO (Extracorporeal Membrane Oxygenator
Flexible Fibreoptic Video Bronchoscope
Ultrasonography Machine (Portable)
RFA (Cooled Radio Frequency Ablation)
Anaesthesia Simulation Lab
Human Patient Simulator (Adult Manikin)
Group B: CTVS
Heart Lung Machine with all accessories
Cell Saver
Intra Aortic Balloon Pump
Invasive Cardiac Monitor
Ventilator
ACT Machine
ETO Machine
External Pacemaker (Single Chamber)
External Pacemaker (Dual Chamber)
Syringe Infusion Pump
Surgical Loupe
Surgical Head Lamp
Sternal Saw
Redo Sternal Saw
Surgical Instruments Set
Group C: General Surgery
4K HD Endoscopy System
Advance Visualization Tower- 3D in 4K resolution with Fluorescence Imaging (ICG)
Echo Portable Color Doppler Equipment with Tee for OT
Surgical Skill Lab
Simulator for Adult Fast Examination
Paediatric Fast and Acute Abdominal Ultra Sound Phantom
RFA (Radiofrequency Ablation Machine)
VAAFT System
Portable Diode Laser and Emission
Group D: G. I. Surgery
Modular OT
OT Light
Laparoscopic Instruments
Electro Surgical Unit
Open Laparoscopic Instruments
OT Table
Body Composition Analyzer
Group E: Neurology
Transcranial Doppler Machine
Plasmapherasis Machine/ Apheresis

High Frequency Ultrasound Machine for Nerve and Muscle Examination
RTMS Machine (Repetitive Trans Magnetic Stimulation Machine)
Autonomic Testing Lab (Tilt Table Machine)
8 Channel EMG/ NCS/ EP System with Ultrasound
Long Term & Quantitative EEG System with Video
64 Chanel Video EEG System
4 Chanel Digital EMG/ NCV/ EP System
3 Channel Portable NCV/ EMG/ EP
Portable 32 Channel EEG System
Group F: Paediatric Surgery
Paediatric Laparoscopy Set 4 K with 2D- 3D display system with Fluorescence Imaging
Flexible Upper and Lower G.I. Scopy Set
Hand Instruments for Open Surgery
OT Table & OT Light
Image Intensifier
Ventilator
Forced Air Warming Machine
Vessel Sealer Energy Source
Plasma Steriliser
Group G: Pathology
Automated IHC
Real-Time PCR System with accessories
Chemidocumentation Imaging System
Electrophoresis unit with Power Pac – (Universal power supply)
Block Cabinet 25000 capacity
Liquid based cytology
Automated urine chemistry Analyser
Automated urine sediment analyser
Automated semen Analyzer
Cold Plate (Cooling Plate)
Fluorescent Microscope with FISH Software
Digital Slide Scanner
FISH Work - Station
Automatic Rotary Microtome
Cytocentifuge (cytospin)
Flow Cytometry
Slide cabinet (Vertical 100000 capacity)
Slide cabinet (Horizontal) 5,000 capacity
26 head microscopic with camera
Biheaded Microscope
Triheaded Microscopic
Next-generation sequencing (NGS)
Sanger sequencer
Droplet Digital PCR with accessories (ddPCR)

Storage Cabinet for specimen
Bone decalcified
Bone cutter
Tissue Flotation Bath
Slide Warming Table
Electron Microscope
Sample preparation for Electron Microscopy **Ultra Microtome** **Plunge Freezer** **Automated Tissue Processor**
Integrated fully Automated Histopathology work station
Digital Incubator
Spectrophotometer
Centrifuge
Ultra-centrifuge with rotors and accessories
CO_2 Incubator with 4-split segmented glass inner door and accessories
Refrigerated Microcentrifuge
Nano Drop
Fully Automated Autoclave
Walk - in Cold Room
ICP-OES
Group H: Physiology
Exercise Physiology System/ Gas analyser
Advance PFT Lab (Spirometer with diffusion DLCO)
Interactive computing board with podium for seminar room
Computer Assistant Learning module for teaching UG (1st MBBS) and PG (MD)
Group I: Radiology
Flat Panel Detector
256 Slice CT Scan
Group J: RIO
RATCAM
Group K: Urology
O.T. & Other Instruments 1.4 Fr. Ureteroscope and 6 Fr. Paediatric Nephroscope
ESWL Machin
Endoscopes Upper and Lower Tract for Adults & Paediatrics
4 K Endovision System with working Instruments
RIRS- Video with CMOS and Fiberoptic
BK Ultrasound Scanner with all Transducers including ABD Trus Lap and Robotic Arms
Advance Integrated Videourodynamic with chair C Arm with Ambulatory Urodynamic Work Station on Turnkey Basis
DA Vince Robotic System by Intuitive
Flexible Disposable Digital RIRS
Open Surgical Instrument for Renal Transplant, Self Retacning Retractors
Flexible Digital Uretero-Renoscope

ANNEXURES

ANNEXURE - I

PRICE SCHEDULED

LOCATED WITHIN INDIA

1	2	3	4	5							6
				Price per unit (Rs.)							
Scheduled	Brief description of goods Make: Model:	Country of origin	Qty. nos.	Ex-factory/ ex-warehouse /ex-showroom/off-the shelf (a)	Excise duty(if any) % and value. (b)	GST (if any) % and value. (C)	Packing and forwarding charge (d)	Inland transportation, insurance for a period including 3 months delivery, loading/ unloading and incidental cost till consignee site. (e)	Incidental services (including installation and commissioning, supervision, demonstration and training) at the consignee site. (f)	Unit price (at consignee site basis(g) (a + b + c + d+ e + f)	Total unit price (At Consignee Site) Basis Rs. 4x5 (g)

Total quoted price in Rs.
In Words:

Note:

1. If there is a discrepancy between the unit price and total price THE UNIT PRICE shall prevail.
2. The charges for Annual CMC after warrantee shall be quoted separately as per price scheduled.

Place:
Date:

Name:
Business Address:-

Seal and Signature of the bidder

ANNEXURE – II

COMPREHINSIVE ANNUAL MAINTENANCE CONTRACT PRICES SCHEDULE

Sl. No.	Item Description	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	5th Yr.	Total Comprehensive Annual Maintenance Contract over a period of five years after expiry of warranty period of five years from the date of successful installation. (c + d + e + f + g)
a	b	C	d	E	f	g	h
1.	Name of the Equipment: Make: Model: Qty.:						
2.	Name of the Equipment: Make: Model: Qty.:						

Scope of Contract (details as mentioned in the Clause No. – 13 of "Instruction to Bidder" & Clauses No.: 3, 4 and 5 of "Condition of Contract"):

a) The rate of Comprehensive Annual Maintenance Contract as mentioned above should cover the Complete System. Complete System should include the basic unit and allied supporting components like UPS, Stabilizer, Computer System, Printer, De-ionizer, Dehumidifier etc to be supplied by the bidder along with basic unit.

b) **Preventive maintenance visit:** Four Maintenance visits at regular interval for usual maintenance & supervision failing which 25% of the contract amount per visit would be deducted as penalty.

c) **Break down maintenance visit:** As & when required

d) **Response Time:** within 48 Hours.

e) Uptime Guarantee: 95% of 365 days

f) The above-mentioned charges should includes labour charges for maintenance and breakdown visits per year, spares, accessories and all type of consumables required for the maintenance of the supplied items. If any spares / consumables /accessories etc. are not covered under above-mentioned charges; it should be clearly mentioned with frequency of replacement and with rate. The validity of rate of such items should also be mentioned clearly. What will be the rate of escalation on the quoted rate after expiry of the validity of rate of such item must be mentioned.

g) Payment of Comprehensive Annual Maintenance Contract would be made on half yearly basis after completion of work and satisfactory working report. In no case, advance payment is to be considered.

ANNEXURE – III

MANUFACTURER'S AUTHORISATION FORM

(To be submitted by authorized dealers/representatives/importers)

No. Dated:

To
The Director
Indira Gandhi Institute of Medical Sciences,
Sheikhpura,
Patna – 800 014 (Bihar, India)

Dear Sir,

Tender No :
Equipment Name :

1. We …… (Name of the OEM) are the original manufacturers of the above equipment having registered office at …….. (full address with telephone number/fax number & email ID and website), having factories at _____ and _____ , do hereby authorize M/s._____ (Name and address of bidder) to submit tenders, and subsequently negotiate and sign the contract with you against the above tender no.

2. No company or firm or individual other than M/s._____ are authorized to bid, negotiate and conclude the contract in regard to this business against this specific tender.

3. We also hereby undertake to provide full guarantee/warrantee /Comprehensive Annual Maintenance Contract as agreed by the bidder in the event the bidder is changed as the dealers or the bidder fails to provide satisfactory after sales and service during such period of Comprehensive Warranty / Comprehensive Annual Maintenance Contract and to supply all the spares/ accessories / consumables etc. during the said period.

4. We also hereby declare that we have the capacity to manufacture and supply, install and commission the quantity of the equipment's tendered within the stipulated time.

(Name)

for and on behalf of M/s._____

Date: (Name of manufacturers)

Place:

Note: This letter of authority should be on the letterhead of the manufacturing concern and should be signed by a person competent and having the power of attorney to bind the manufacturer.

ANNEXURE – IV

BANK GUARANTEE FORM

To

The Director
Indira Gandhi Institute of Medical Sciences,
Sheikhpura,
Patna – 800 014 (Bihar, India)

WHEREAS _____ (Name and address of the supplier) (Hereinafter called "the supplier") has undertaken, in pursuance of tender no_____ dated _____ (herein after called "the contract") to supply The Director, Indira Gandhi Institute of Medical Sciences, (address) with ……. (Description of goods and supplies).
AND WHEREAS it has been stipulated by you in the said tender/bid that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein as security for compliance with its obligations in accordance with the bid scope;

AND WHEREAS we have agreed to give the supplier such a bank guarantee;
NOW THEREFORE we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total amount of _____ (Amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.
We hereby waive the necessity of your demanding the said debt from the supplier before presenting us with the demand.

We undertake to pay you any money so demanded notwithstanding any dispute or disputes raised by the supplier(s) in any suit or proceeding pending before any Court or tribunal relating thereto our liability under these presents being absolute and unequivocal.
We agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition no modification.
No action, event, or condition that by any applicable law should operate to discharge us from liability, hereunder shall have any effect and we hereby waive any right we may have to apply such law, so that in all respects our liability hereunder shall be irrevocable and except as stated herein, unconditional in all respects.

This guarantee will not be discharged due to the change in the constitution of the Bank or the Supplier(s).

We, _____ (indicate the name of bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent, in writing, of The Director, Indira Gandhi Institute of Medical Sciences, Patna (Bihar). This Guarantee will remain in force up to (Date). Unless a claim or a demand in writing is made against the bank in terms of this guarantee on or before the expiry of (Date) all your rights in the said guarantee shall be forfeited and we shall be relieved and discharged from all the liability there under irrespective of whether the original guarantee is received by us or not.

(Signature with date of the authorized officer of the Bank)
…….

Name and designation of the officer
…….
…….

Seal, name & address of the Bank and address of the Branch

ANNEXURE – V

(TO BE SUBMITTED WITH TECHNICAL BID)

POWER OF ATTORNEY

(On a Stamp Paper of relevant value)

I/ We…….(name and address of the registered office) do hereby constitute, appointand authorise Sri/Smt……(name and address) who is presently employed with us and holding the position of ……..... as our attorney, to act and sign on my/our behalf to participate in the tenderno……..for …… (Equipment name).

I/ We hereby also undertake that I/we will be responsible for all action of Sri/Smt…….. undertaken by him/her during the tender process and thereafter on award of the contract. His / her signature is attested below

Dated this the ___day of 202_ For_____

(Name, Designation and Address)

Accepted

_____
(Signature) (Name, Title and Address of the Attorney)

Date : _____

Specification & Allied Technical Details

Group-A: Anaesthesiology

1: Flowtrac Cardiac Output Monitoring

Advanced Cardiac output hemodynamic monitor with AI integration/ HPI.

1. It should have a touch screen with active area of 12.1 inch.
2. It displays intermittent & continuous hemodynamic measurement when used with appropriate disposable sensor.
3. It should be able to give Auto calibration technology based Continuous Cardiac Output (CCO), Cardiac Index (CI) Stroke Volume (SV),) Stroke Volume Index (SVI) Stroke Volume Variation (SVV),Pulse pressure Variation(PPV) Systemic Vascular Resistance (SVR) with CVP Transducer connection for CVP input, Systolic Pressure (SYS), Diastolic Pressure (DYS), Mean Arterial Pressure (MAP), HPI, DP/DT, EADYN when using arterial line sensor only and without using any type of manual calibration.
4. It should be equipped with 3 expansion module & 2cables receptacles.
5. It should have artificial intelligence Module (Hypotension Prediction Index) to measure hypotension probability before the incidents.
6. It should have also provided dP/dt-Systolic slope maximal upslope of the arterial pressure waveform from a peripheral artery. Afterload-Dynamic arterial elastance (Eadyn) the ratio of pulse pressure variation to stroke volume variation (PPV/SVV).
7. It should have upgradable future facility of other technologies like Non-Invasive Continuous Cardiac Output, Pulmonary Artery Catheter Module and Cerebral/Tissue Oximetry parameter (StO2) using Near Infrared Spectroscopy (NIRS) technology with at least 5 different wavelengths and light penetration depth of at least 2.5 cm.
8. It should have the ability to analyze patient's response to specific interventions such as fluid challenge along with Frank Sterling curve, various other interventions etc. All these interventions should be time stamped and stored for retrospective analysis.
9. It Should have option of wired and wireless communication.
10. It should have hot swappable battery.
11. It should have a display capacity of at least 4 trend lines and 4 numeric display, optional physiology and physio-relationship screen.
12. It should have the option of connectivity with hospital information system.
13. It must save data up to at least 72 hours.
14. It must have screen shot and data download facility through any USB stick.
15. It must have an HDMI, USB & ETHERNET port for various connectivity.
16. It must US FDA Approved

Below Consumables must provided with each monitor

1. Cardiac Output Sensor –10
2. Cardiac Output Sensor with AI– 10
3. Transducer for SVR/SVRI- 10

2: Trans Oesophageal Echocardiography

Specification of Transesophageal echocardiogram Machine

The specific minimum requirements for this equipment are as follows.

1. Latest generation, highest end & technologicallyadvanced Digital 4D (Live 3D) echocardiography system
2. System must have adult and Paediatric cardiology transducer witheither single crystal technology or pure wave technology or matrix forexcellent Gray scale image quality on difficult to image patients.
3. It should be suitable for Cardiac, Vascular access, Abdominal, Lung, Nerve blocks, MSK and other point of care applications in anesthesia
4. The equipment must be capable of operating in B Mode, Anatomical M-Mode, Color, Color Power Doppler (CPD), Pulsed Wave, TDI and Continuous wave doppler modes.
5. It must support pinlesstransducers' technology with linear array, curved array, phased array& TEE formats.The transducers should be easy to clean and disinfect.

6. The system shall have broadband architecture with an operating frequency of at least 1 to 19 MHz and should process a dynamic range that is at least 180 dB or more.
7. The system should have 15-inchor more medical Grade LCD/LED clinical display monitor with wide viewing angle. The system must be portable to access and should be mounted on sleek stand whichcan be easily adjusted from vertical to horizontal position or vice versa as per end user requirement. There should be provision for proper cable management to avoid tangles and dragging of transducer cables when moving the system.
8. System should be capable of supporting latest 4D (Live3D) matrix transducer capable of supporting 4D (Live 3D zoom),triggered full volume and triggered 3D color volume with electrocautery suppression.
9. System must be offered with Speckle reduction imaging: Imageprocessing technique to remove speckles and clutter artifacts.
10. System must possess Tissue harmonicand Pulse Inversion technology on transducers offered or wherever required.
11. The system should have robust data security including an initial security set-up wizard that allows users to choose their security level for data protection.
12. Centerline marker facility on linear & curvilinear probe as well on monitor screen should be available for aiding during procedural guidance.
13. Should be able to perform MPR views for Quantification from 3DImaging on Volume Measurements like LV volumes, Ejectionfraction from 3D Image, etc.
14. The system shall have the ability to function by 100-240VAC, 50-60 Hz or in-built battery power with the same degree of functionality. Inbuiltbattery back-up of system should be at least one hour expandable up to three hours on trolley, without an externally powered UPS to handle critical and emergency situations.
15. System should reduce the speckle noise, improves contrast resolution, and provides ease of diagnosis on different applications with auto smart options for ease of use by multiple end users.
16. Thesystem internal memory/hard diskshould be at least512 GB to 1TB, to storeimages, clips or combination of the same.
17. The system shall have a dedicated acute care, vascular & cardiac calculations packages.
18. The system shall display at a maximum depth of 35 cm, and a minimum of 1 cm.
19. The system should have a color compare mode for real time side-by-side comparison of structures in 2D or 3D and color mode.
20. The system shall be DICOM 3.0 compliant and allows for saving the DICOM configuration via USB, so they are easy to replicate or restore.
21. Local Service Facility should be available at Patna,Bihar.

A. Transducers:

- **a.** Adult transthoracic 2 D probe {Phased array matrix transducer withFrequency ranging from **1-5 ± 1** MHz, of Single crystal or PureWave
- **b.** Adult Transthoracic 3 D probe Phase Array matrix Transducer withFrequency ranging from **1-5 ± 1** MHz,
- **c. Paediatric Transthoracic 2 D probe**
- **d.** Adult Transesophageal 3 D probe,
- **e.** Paediatric Transesophageal 2D probeEpi-aortic probe, vascular probe {Linear Array Matrix transducerwith Frequency of 5-19 MHz}.
- **f. Linear array Probe with frequency ranging from 4-11 ±2 Mhz.for Peripheral vascular**

B. Need to supply:

1. **ECG Module: The ECG Module connects directly to the ultrasound system through a dedicated ECG port. It allows the system to display an ECG trace on the clinical monitor.**
2. Medical Grade B/W Thermal printer

C. **Following Transducers & accessories/software/items** should be available with quote model for the future upgradation.

a. Multifrequency, small footprint curved array transducer with 35 mm footprint and operating frequency of 3-10 MHz for Abdomen, Gynecology, Lung, Nerve, MSK, Spine examinations.

b. 11-3 MHz Phased, Scan depth: 2–15 cm for Exam types:
Neonatal and Pediatric Cardiac,
Neonatal and Pediatric Lung,
Neonatal and Pediatric Abdominal,
Neonatal Cephalic.

c. 13-6 MHz hockey stick shape linear, Scan depth: 1–6 cm,
Exam types:
Musculoskeletal, PIV, Superficial,
Venous.

d. Multifrequency broadband small footprint Linear transducer nearly 20 mm wide and operating frequency range of 5-19 MHz for Arterial, Lung, MSK, Nerve, Ophthalmic, Superficial, Venous, PIV applications.
e. 8 - 3 MHz TEE probe for Exam Types: Cardiac, Cardiac Resuscitation

D. The manufacturer shall provide a five-year standard warranty on the system and standard Transducers.
E. The system manufacturer shall additionally provide onsite product training and access to ultrasound education website for end users during installation.

3: CRRT Machine

1	System should be able to perform Continuous Renal Replacement Therapy(CRRT) for Patients with acute renal failure and/or fluid overload.
2	System should be able to perform Therapeutic Plasma Exchange(TPE) therapy for patients With diseases where removal of plasma components is indicated.
3	System should be able to perform Hemoperfusion (HP) for patients with conditions where Immediate removal of substances by adsorption is indicated.
4	System should be able to perform Extracorporeal CO2 Removal(ECCO2R) for patients with Conditions where extracorporeal elimination of carbon dioxide is indicated.
5	CRRT therapies that the system is able to perform include: • Slow Continuous Ultrafiltration (SCUF) • Continuous Veno -Venous Hemofiltration (CVVH) • Continuous Veno –Venous Hemodialysis (CVVHD) • ContinuousVeno-Venous Hemodiafiltration (CVVHDF)
6	System should be able to perform ECCO2R (Standalone) Preferably
7	System should be able to perform ECCO2R with CRRT (Preferably)
8	System should have four pumps, one each for Blood, Dialysate, Replacement fluid and Effluent/filtrate
9	Provision of separate pump for Pre-blood infusion
10	Should have a seprate Syringe pump assembly that delivers anticoagulant into the blood flow Path between the blood pump and the filter.
11	Should have Auto-effluent (AE)pump system that Pumps effluent to a drain from the dual- effluent bag system, one bag empties to The drain while the other bag fills with effluent. (preferably)
12	Should have closed blood circuit to prevent air to blood interface
13	System should have 3 weighing scales with weighing capacity of atleast5kgfor monitoring Of the volumes of the total filtrate ,replacement fluid and dialysate
14	Provision of separate weighing scale for pre blood pump
15	Euipped with independent Pre filter pressure sensor
16	Euipped with independent Effluent pressure sensor
17	Euipped with independent Blood access pressure sensor
18	Euipped with independent Blood return pressure sensor
19	System should have fluid/blood warmer for blood/dialysate warming
20	Machine should be able toincrease or decrease the temperature in increments of 0 point 5 degree C with temp range to be35 -38 deg C
21	System should have capability of changing therapies without interrupting the treatment
22	Provision for Regional Citrate Anticoagulation for all CRRT the rapies
23	Provision for simultaneous delivery of pre and post filter replacement solutionin CVVH and CVVHDF therapies
24	Provision for recirculation mode
25	Maximum recirculation time is 60 minutes for blood recirculation and 120 minutes for saline solution.
26	120 minutes for saline solution.
27	Provision to enable low weight compatible set for CRRT treatment of babies equalor greater Than 8K g weight
28	Provision of changing syringe size
29	Provision to upgrades software

30	System should operate with a low extracorporeal blood volume which is equal or less than 155ml(97 ml for Paediatric)in order to improve patient tolerance without affecting patient's Haemodynamic stability and limited blood loss
31	Built in dosage calculator
32	Equipment should provide pre and post dilution capability using the same treatment set
33	Provision to use lactate based dialysate solution and bicarbonate solution simultaneously for CVVHDF therapy
34	Emergency hand crank to be provided for returning blood to patient in case of power failure
35	The system should have integrated infusion pump for continuous or bolus anticoagulation With flow rate of 0.5 ml-5 mL/Hr
36	The system shall be easy to clean, disinfect and sterilize
	FLOWRATE
37	Minimum Blood pump flow rate range with+/-10% accuracy (ml/min)10- 450 mL/min
38	Minimum Replacement Solution flow rate range(ml/hr)0-8000 mL/Hr
39	Minimum Dialysate pump flow rate range(ml/hr) 0-8000 mL/Hr
40	Minimum Effluent pump flow Rate Range(ml/hr) 0-10,000mL/Hr
	PRESSURE MONITORING RANGE
41	Minimum Access line pressure monitoring range(-) 250 mmHg to(+)450 mg
42	Minimum Return line pressure monitoring range(-) 50 mmHg to(+) 350 mmHg
43	Minimum Pre Filter line pressure monitoring range(-) 50 mmHg to (+) 450 mmHg
44	Minimum Effluent line pressure monitoring range(-)350mmHg to(+) 400 mmHg
	SAFETY FEATURES
45	Built in Blood leak detector
46	Built in air detector
47	System should have Alarms (Audio and Visual)in case of power failure, equipment malfunction, air in line, blood leak, arterial/venous pressure out of limits, empty dialysate/replacement bag, full effluent bag, TMP out of limit and filter clotting
48	The system shall incorporate a self diagnostic program which upon start up, detectand Clearly indicate any defects or malfunction
49	System should have a hand held Barcode Reader (scanner)for its consumables(sets). If the scanned barcode does not match the selected set, the machine should raise alarm to the Operator to scan the correct set.
50	The system should automatically do a complete self-test ten minutes After the treatment begins and then every two hours after that.
	USER INTERFACE
51	Includes a color touchscreen display that rotates and tilts for optimal viewing,
52	Display size(inch) 10 -15
53	The equipment should be able to monitor and display the parameters, Arterial pressure, Venous Pressure, TMP, Replacement flow rate, dialysate flow rate, ultrafiltration rate, temperature, Treatment therapy's set time, elapsed time and remaining time, continuous Anticoagulation rate and anticoagulation by bolus
54	The machine should display continuous information of all parameters on one screen including Graphical display of pressure monitoring
55	Should be able of logging data for 10 years of expected usage (1200 Hours per year) in its storage memory.
56	Equipped with USB port that Communicates with an external type AUSB device.
57	Scales should have LED colour coding where the disposable set lines correspond to scales and Associated umps
	ELECTRICAL FEATURES
58	Should have auto ON/OFF Facility
59	LED indicator on front panel for status of machine
60	Power input 100 –240 VAC, 50/60 Hz fitted with Indian plug Machine should have automatic battery backup for blood pump without interruption for at least 30 minutes during power failure
61	ENVIRONMENTAL CONSIDERATIONS
62	The unit shall be capable of being stored continuously in ambient Temperature:-18 to + 54°C (0–130°F) Humidity :10–85% RH(non-condensing at 35°C, 95°F)
	PACKINGMODE
63	The product should be packed with all its accessories in such a way that there will be no Transit damage takes place
	CERTIFICATIONS& REPORTS
64	Availability of test report/quality assurance report from parent manufacturer

65	Product certification EU-CE/US-FDA/BIS
66	Product Certificate No G1 062680 0134
67	Product CE Certificate valid
68	Product Certificate issuing authority TUV
69	Four digit number of notified body If product is EU-CE certified- 0123
70	Confirmity to Manufacturer's Certification (copy of the same should be submitted to buyer)
71	ISO 13485
72	System shall comply with IEC EN 60601-1-Type CF(Cardiac Float) for electrical safety
73	Submission of all the certifications and test reports to the buyer along with supplies on demand (incl. CE, CE Design, declaration of conformity, ISO) & FSC in cases as and when needed
	INSTALLATION & TRAINING
74	Supplier to perform installation, safety and operation checks before handover
75	Training of users in machine operation, trouble shooting aspects and basic maintenance shall be provided
76	Contact details of manufacturer, supplier and local service agent to be provided
77	WARRANTY
78	Warranty (Option of comprehensive warranty is available through
79	Bidding only, which if opted will supersede normal warranty in the catalogue)
80	5 years from the date of installation
81	DOCUMENTATIONS
82	User/Technical/Maintenance manuals to be supplied in English
83	Certificate of calibration to be provided

4: ECMO (Extracorporeal Membrane Oxygenator

Technical specification of ECMO

It should be small, compact, light weight, movable with appropriate size locable caster wheels.

1. **Centrifugal pump (console with Accessories)**

i. Should have a monitoring system with touch screen display, to monitor control and record various parameters with alarm setting.
ii. Should have to generate 0 – 5000 RPM speed.
iii. Should be able to generate flow rate of 0 to 9.9 liters per minute.
iv. Should be able to work on power supply of 100 to 240 V AC/ 50to 60 HZ and 11 to 28 Volt DC
v. Console should be light weight and compact (approx 10 kgs weight)
vi. Automatic online monitoring system should have following monitoring parameters, e.g.
    a. Arterial and venous blood temperature
    b. Venous blood oxygen saturation
    c. Blood haemoglobin and hematocrit levels
    d. Prepump, post pump/ premembrane, post membrane pressures
    e. Pressure drop between oxygenater membrane
vii. Should have following modes of application
    a. Operating room mode
    b. ICU mode
    c. Transport mode
viii. Should have following modes of operation
    a. RPM, LPM, Back flow detection, zero flow regulation, global override, and night mode.
ix. Should have level sensor safety system
x. Should have integrated bubble sensor & flow sensor
xi. Should have portable emergency hand crank, to enable perfusion even in complete system failure
xii. Should be able to record data online and can be transferred to a USB stick easily
xiii. Battery backup of 1.5 hours (approx)
xiv. 01 no. connection for alarm, output (ward call)
xv. 01 no. connection for Ethernet cable
xvi. 01 no. connection for external drive
xvii. 01 no. connection for ECG signal
xviii. Should have road and air transport approval
xix. System should comply with requirement of the 1 EC 60601 – 1 – 2 standard on electromagnetic compatibility

xx. Should have 03 timers and one reverse countdown timer

2. Heating unit with its accessories

i. Temperature range setting from 360 deg C to 390 Deg C with increments of 0.1 deg C with Safety system to protect against high temperature

ii. Should have display for set and outlet temperature

iii. Console must be compact and light weight (approx 9 kg weight)

iv. Able to work on power supply of 230 V, 50 Hz

v. Water reservoir capacity should not be more than 2 liter

vi. Should have heat resistant tubings with Hansen coupling for quick connection

3. Sprinter Cart

i. Should have advanced cart design with maximizing safety and convenience to more cart any where

ii. Should have infusion pole mast (Height adjustable) and also have provision for a second one.

iii. Should have a convenient oxygen cylinder storage facility

4. Air – oxygen Blender

i. Should have mechanical air-oxygen blender/ Electronic air oxygen blender with hoses with air trap for continuous use

5. System should have US FDA and European CE certified or BIS certified and certificate to be submitted.

6. Completer set of Heart Lung support (HLS kit) (Qty: No.)

- Specification of Heart Lung Support (HLS) Kit:
  i. Hollow fiber diffusion membrane oxygenator including centrifugal pump with 30 day CE certification in HLS kit.
  ii. PVC tubing which make a circuit with 30 day CE certification of usage.
  iii. Tip to tip bioline coating (Albumin + Heparin) (which includes the whole circuit with all the components).
  iv. Oxygenator unit includes a hollow fibre heat exchanger with very less pressure deop.
  v. Circuit minimized to its basic minimum components.
  vi. De-airing membrane in oxygenator for emergency in – operation hassle free de-airing.

7. Cart should have

a. A stainless steel mobile cart

b. Should have a height adjustable infusion pole

c. Should have gas cylinder holder

SN	BOQ	QTY	UOM
1	Mobile ECMO Machine with accessories: As per technical specification	01	No
2	Heater Unit with accessories: as per technical specification	01	No
3	OEM cart with accessories: as per technical specification	01	No
4	Air – Oxygen Blender: as per technical specification	01	No
5	Heart lung support (HLS) kit: as per technical specification	01	No

5: Flexible Fibreoptic Video Bronchoscope

SPECIFICATION OF FLEXIBLE INTUBATION VIDEO ENDOSCOPE (ADULT SIZE + PED + NEONATE SIZE) NON FIBER (FINAL)

- Flexible Intubation Endoscope with CMOS chip on tip for digitally transferring the image to the screen. There should be NO Images Fiber bundles/non fiber optics. Intubation Endoscope should display Full Frame 4/3 or 16/9 Imaging and not the circular image.
- For adult outer diameter of scope should be ranging 4.8- 5.5 mm with working length of 65cm or more. Up and down tip deflection should be same ranging 120-180 degrees. Working channel should be 2.0 -2.3mm and it should take ETT from 6.0 mm sizes onwards.
- For Pediatric outer diameter of scope should be ranging 3.0- 4.1 mm with working length of 65cm or more. Up and down tip deflection should be same ranging 120-180 degrees. Working channel should be 1.4 -1.6 mm and it should take ETT from 4.5 mm sizes onwards.
- For neonate, outer diameter of scope should be ranging 2- 3 mm with working length of 50 – 55 cm or more. Up and down tip deflection should be same ranging 100-130 degrees and it should take ETT from 3.0 mm size onwards
- Flexible Intubation scope should display good quality picture by connecting it with 7 inch or more TFT monitor/integrated LED light source (**One monitor for each video Endoscope**)
  - TFT monitor/Screen should have feature control buttons on the screen with HDMI output for connecting to a big screen.
  - Monitor resolution should be minimum 1920 X 1200 pixels in 16:9 formats.
  - Automatic/ manual white balance facility should be available.

    - Monitor should run on battery, when fully charged should work for more than 60 minutes.
    - Monitor should be upgradable.
- Documentation of Video & still images should be possible with operating buttons on the scope to be recorded on SD card and USB pen drive present in the monitor
- It should be light weight, high resolution & portable flexible scope
- Airway Guide (cum Bite block) for Oral intubation should be provided with the set.
- ET TUBE HOLDER has to be a part standard accessory and 5 piece should be provided
- Set should include- Suction Adaptors (Disposable), Cleaning brush & Leakage tester as standard accessories
- Container for sterilization and storage of scope should be provided
- One Trolley for each scope
- Ten reusable suction caps to be also provided
- Equipment should be European CE/ US FDA approved
- Suitable for following applications-
    - Bronchoscopy
    - Endotracheal Intubation
    - Foreign body removal
    - Bronchial Lavage
    - Inspection of the Airways
    - Dilatation Tracheotomy

-biopsy forceps, grasping forceps should be provided with alligator jaw
-Trolley from same manufacturer
-USFDA or CE European approved
-Warranty 5yrs and CAMC 5yrs
-Rate of consumable should be quoted separately & fix for minimum 3years in Indian rupees

Note: All equipments /accessories should be reusable /Autoclavable/ chemical sterilization

6: Ultrasonography Machine (Portable)

Specification of high-end compact Color doppler Ultrasound (for Anesthesia purpose)

The system should be state of art latest ultrasound technology and should be suitable for Cardiac, Vascular access, Abdominal, Lung, Nerve blocks, MSKand other point of care applications in anesthesia and critical care scenario.The specific minimum requirements for this equipment are as follows.

1. The equipment must be capable of operating in B Mode, Anatomical M-Mode, Color, Color Power Doppler (CPD), Pulsed Wave, TDI and Continuous wave doppler modes.
2. It must support pinlesstransducers' technology with linear array, curved array, phased array& TEE formats.The transducers should be easy to clean and disinfect,pls specify their immersion rating.
3. The system shall have broadband architecture with an operating frequency of at least 1 to 19 MHz and should process a dynamic range that is at least 180 dB or more.
4. The system should have 15-inchor more medical Grade LCD/LED clinical display monitor with atleast 80 degrees wide viewing angle. The system weight should be less than 7.6 Kg and should be mounted on sleek stand whichcan be easily adjusted from vertical to horizontal position or vice versa as per end user requirement. There should be provision for proper cable management to avoid tangles and dragging of transducer cables when moving the system.
5. To prevent cross contamination and infection, the system should possess a sealed & spill proof 10 inch or more touch screen customizable user interface with limited sealed physical buttons which should be easy to clean and disinfect for use in OT &ICU environment.Please specify liquid ingress protection rating for system.
6. System reliability should be ascertained by architecture with latestoperating system, which is not easily prone to failure, hang ups, data corruption, while in networking environment.(Please Specify the technology)
7. System must possess Tissue harmonicand Pulse Inversion technology on transducers offered or wherever required.
8. The system should have robust data security including an initial security set-up wizard that allows users to choose their security level for data protection.
9. Centerline marker facility on linear & curvilinear probe as well on monitor screen should be available for aiding during procedural guidance.
10. The system shall have the ability to function by 100-240VAC, 50-60 Hz or in-built battery power with the same degree of functionality. Inbuiltbattery back-up of system should be at least one hour expandable up to three hours on trolley, without an externally powered UPS to handle critical and emergency situations.
11. The system shall go from the off status to active scanning in less than 40 seconds to address any emergency or critical care needs for interventional and procedures use.
12. The system and standard transducers should be sturdy and drop safe to absorb shocks / any accidental bang on hard surface in busy hospital environment.

13. System should reduce the speckle noise, improves contrast resolution, and provides ease of diagnosis on different applications with auto smart options for ease of use by multiple end users. Please specify the technology.
14. System should have advanced Auto needle visualization tool to eliminate the "hidden needle" in steep angle interventional procedures of vascular access, Biopsies, Small Parts, Musculoskeletal and Nerve examinations.(Please Specify the technology)
15. Thesystem internal memory/hard diskshould be atleast 128 GB, to storeimages, clips or combination of the same.
16. The system should have onboardhow-to videos (forimaging basics, system use etc.) and should have inbuilt educational video tutorials related to Acute care, procedures, Covid, Anesthesia, Pain Management, MSK etc for scan along learning of end users.
17. The system shall have a dedicated acute care, vascular & cardiac calculations packages.
18. The system shall display at a maximum depth of 35 cm, and a minimum of 1 cm.
19. The system should have a color compare mode for real time side-by-side comparison of structures in 2D and color mode.
20. The system shall provide the user with a 8X live zoom function that increases the region of interest, without affecting the quality of the image.
21. The system shall be DICOM 3.0 compliant and allows for saving the DICOM configuration via USB, so they are easy to replicate or restore.
22. **Transducers:**
    a. Broadbandmulti-frequency Linear array transducer with footprint b/w 35-40mm wide and operating frequency range of 3-12MHz for arterial, nerve, venous, musculoskeletal, lung and superficial examinations.
    b. Adultcurved array transducer with approx. 60 mm footprint and operating frequency of 1-5 MHz for abdominal, MSK, Nerve, spine, gynae and lung imaging.
    c. Adult Phased array transducer with frequency range of 1-5 MHz for cardiac lung, TCD & abdominal examinations.
23. The manufacturer shall provide a five-year standard warranty on the system and Transducers
24. The system manufacturer shall additionally provide onsiteproduct training and access to ultrasound education website for end users during installation.
25. **Optional Transducers & accessories**(to be quoted separately):
    a. Multifrequency, small footprint curved array transducer with 35 mm footprint and operating frequency of 3-10 MHz for Abdomen, Gynecology, Lung, Nerve, MSK, Spine examinations.
    b. Multifrequency broadband small footprint Linear transducer nearly 20 mm wide and operating frequency range of 5-19 MHz forArterial, Lung, MSK, Nerve, Ophthalmic, Superficial, Venous, PIV applications.
    c. Multi-frequencyLinear array transducer with operating frequency range of 5-14 MHz for arterial, nerve, venous, Breast, Carotid, musculoskeletaland superficial examinations in adults.
    d. Medical Grade B/W Thermal printer

7: RFA (Cooled Radio Frequency Ablation)

S. No.	Description of Specifications: RFA (Cooled Radio Frequency Ablation)
1.	The Equipment should be useful for standard RF ablation & Cooled RF ablation for treating chronic pain of nerve origin
2.	**Indications:** Cervical pain, Thoracic pain, facet pain, Lumber pain, Sacro-iliac Joint pain, Discogenic pain, Hip Joint pain, Knee pain etc,
3.	RF generator must support Bipolar RF for Biacuplasty procedure
4.	The RF machine must have separate quad cool pump assembly to treat cooled RF related muscle / nerve origin chronic pain pathology.
5.	RF must have water cooled probe.
6.	**The equipment should have following features in a single unit** a) Standard RF b) Pulsed mode c) Cooled RF d) Bipolar Mode
7.	The system should have customizable treatment profiles for quick access. Minimum 15 treatment profiles can be added and deleted as per user convenience.
8.	The system should be able to record clinical logs for the past therapies. Minimum 120 procedure logs should be supported.
9.	The system should support individual probe control before and during treatment. Start and Stop function for individual probe with respect to temperature and time.
10.	The system should automatically extend procedure time if Set Temp does not reach allotted ramp time.

11.	The system should view display Ramp Time, time at Set Temp, and total procedure time in graph form.	
12.	The system should have demo mode for Cooled, Standard, Bipolar, Trandiscal, Pulsed and Stimulation mode for users to review.	
13.	The system should be able to test pump unit, upgrade software and enable live output.	
14.	The system should display warning with numeric code and actionable error message.	
15.	**Screen Display** • The equipment should have LCD color touchscreen. • Should display graphical interface in Real-time, display impendence, temperature, time and voltage independently.	
16.	**RF energy** • For Standard RF • For Bipolar RF • For pulse RF • For Cooled RF	**Standard Temperature & Time duration:** • Temperature display 80-degree C and time 90seconds • Temperature display 40-degree C and time 15 minute • Temperature display 42-degree C and time 90 seconds • Temperature display 60-degree C and time 2:30 minutes
17.	**On insertion of RF Cable**, the equipment should recognize the • Standard RF probes • Bipolar probes for discogenic Pain	
	• **Cooled RF** • **Should have automatic mode to recognize various cables for minimal manual operation.**	
18.	**Impedance measurement, Stimulation, RF output:** • **The impedance measurement should be in the range of 1- 3000 ohms** • **Impedance can be measured in before and during lesion in "Lesion mode", before "stimulation mode" and during cooled RF in Auto temperature mode.** • **Stimulation voltage mode: 0.00-10 V, 0.01 V increment** • **Current mode: 0.00-10 mA, 0.01 mA increment.** • **Stimulation rate: 1-Shot, 2, 5, 10, 20, 50, 75, 100, 150, 180 and 200 Hz** • **Stimulation pulse duration: 0.1, 0.2, 0.5 and 1.0 MS** • **RF energy: 460 KHz** • **Maximum Power: 80W**	
19.	**Software Shutdown Limits During RF Delivery or Stimulation (Safety features):** • **Measured Impedance: < 25 Ω or > 3,000 Ω** • **Measured Temperature: < 15°C, > 100°C**	
20.	**Terms & conditions: Warranty, AMC & CMC** • **After installation of equipment, the Supplier / Manufacturing Company shall provide free warranty as per tender specification.** • **The supplier/ manufacturer should make available spares & consumables of RF machine for the life of the tender.** • **The supplier/ manufacturing company shall undergo C-AMC (Comprehensive annual maintenance contract) or AMC (Annual maintenance contract) each year with user institute/ department.**	
21.	**Certification/ Standards of Equipment's:** • **The system should have CDSCO Registration in India for assuring trusted supply of consumables.** • **The equipment must be ISO, CE & USFDA approved.** • **Equipment must have supporting clinical papers and trials performed on the machine with outcome of the clinical trials.** • **Operational manual should be provided with the equipment.** • **Parent company should provide undertaking of suppling the probes and cannula for 10 years from the date of Installation of machine.** • **Parent company should not increase the prices of probes and cannula more than 10 % each year.** • **Parent company should give written agreement to supply the standby machine with 5 working days in case of any problem or issue with the machine installed in the hospital. Fail to do so, company will be liable for penalty and blacklisting from the state government.**	

22.	• **Parent company should have registered office in India.** • **Product should have 5 yrs. of market standing in India. Predicate product having same application is valid under this scope of requirement.** • **In relation to this machine, please attach users list of India.** **(This is important as many bidders / companies participates in the tender, sales the product & later there is no after sale services by supplier, the supplier close downs his services/ shop related to that product. In such situations, even manufacturing company does not provide after sale services.)**	
23.	**Scope of Supply**:	
	a) R. F. Machine (Advanced Cooled Upgradable Generator) **b) Connecter cable for Trans-discal Biacuplasty procedure** **c) 4 Channel Standard RF** **d) 4 Channel Cooled RF** **e) Peristaltic Quad Pump to perform multi Cooled RF. This needs to be operated in conjunction to the RF generator.**	1no 1no 1no 1no 1no
24.	**The equipment is to be supplied with consumables:**	
	• RF split grounding Pad	10 no
	• Standard RF flexible probe 100mm length, Reusable	1 no
	• Standard RF flexible probe 145mm length, Reusable	1 no
	• Standard RF Cannula supporting 100mm length, 5 mm active tip	10 no
	• Standard RF Cannula supporting 100mm length, 10 mm active tip	10 no
	• Standard RF Cannula supporting 145 mm length,10 mm active tip	10 no
	• Knee Procedure Cooled RF kit - 75mm probe length, with 4mm active tip	1 no
	• Lumber-Facet/SI procedure Cooled RF kit - 150 mm probe length, with 4mm active tip	1 no
	• Biaculoplasty kit- 150mm probe length, with 6mm active tip	1 no
	• Hip Joint procedure Cooled RF kit - 100 mm probe length, with 4mm active tip	1 no
25.	**Training and support:** • Parent Company should provide technical training support to the user department. • The Parent company shall provide training in India at cost of parent company/ supplier firm onregular interval to at least two deputed staff members of the department. • The training is to be arranged at reputed government training center or at the Centre where machine is being used for pain relief procedures. • The training accommodation & to & from travel cost expenditure is to be at the supplier / parent company end. • During initial period & after training, the company should provide authorized person to assist the staff of dept. in using the machine for the RF procedures/ cases as & when required. • Service engineer available with each & every authorize distributor end.	
26.	Please quote separately as optional & mention the any other accessories/ spares (manufacturing specific/ machine specific) which are not covered under these specifications & are important to function the machine & required for the RF procedures.	

8: Anaesthesia Simulation Lab

ANNEXURE 1
It Should offer sophisticated mathematical models of human physiology and pharmacology and capable of determining automatically the patients response to user actions and interventions:
Human Patient Simulation System should comprise the following:
A. MANNEQUIN: It Should be supplied with Adult mannequin should represent the physical characteristic of an adult male / female patient with interchangeable genitalia
It should be fully operational in supine & lateral position and can be placed on O. T. Table, ICU Beds, and patient trolley.

It should react to intravenous drugs, CPR, defibrillation, intubations ventilation, catheterizations & other procedures as outlined below.

- Should physically demonstrate various clinical signs (i.e. heart / breath sounds, palpable pulses, chest excursion, airway patency etc.) which should be dynamically coupled with the mathematical models of human physiology and pharmacology.
- Should respond automatically as per human physiology without any input from instructor/ software and should also have facility for manual intervention by instructor.
- The mannequin shall be able to transmit voice sounds. - The instructor shall be able to simulate patient voice and phrases via microphone

B. SYSTEM CONTROLLER

- Above Mannequin should connect to the system controller.
- The system controller should have facility to be connected to medical gases (through cylinders or hospital central gas pipeline) namely oxygen, CO2, Air, N2O, Nitrogen. The mannequin should not use gas cartridges.
- The system controller should supply mixed gas to mannequin as per underlying physiology.
- The system controller should also supply fluid to the mannequin as per underlying physiology

C. COMPUTER SYSTEM

Simulation system should be supplied complete with Mac based PC console and a Mac based handheld Laptop for instructor to control all aspects of simulator from Bedside of the Patient.

D. UTILITY SOFTWARE

Simulation system should be supplied complete with web based software so that any PC or computer (Mac/ Windows) can be used to connect with simulator.
Should have summary page which should display the events and log, Medication library, Intervention library, current physiological parameters.
Should display real time physiological parameters and should customizable according to ongoing SCE and patient condition
Should have search function to search SCE
The SCE screen page should have an overview section, patient history section, and should define learning outcome/ objective.
- Modification of preconfigured scenarios & patient profiles or creating new scenarios & profiles.
The system shall be capable of operating automatically as per the patient physiology changes because of action taken by the student on the mannequin which permits the simulation to proceed without instructor interaction. - Recording of patients physiology and intervention by student, instructor or central software
- Modification of pharmacokinetics & pharmacodynamic parameters of selected drugs
- Should be supplied with 3 user licences

E. MEDICAL GRADE PATIENT MONITOR

Should have facility to be connected to a real patient monitor for monitoring following parameters:
1) 5 Lead ECG
2) NIBP
3) IBP (2ch)
4) SPO2
5) Cardiac Output
6) ST. Segment & Arrhythmia Analysis
7) ETCO2
8) Anaesthetic agents (Sevoflurane, Isoflurane)

F. MEDICAL GRADE ANAESTHESIA MACHINE – should be compatible with mannequin

- Should be supplied complete with flow meters for Air, Oxygen, Nitrous Oxide with low flow range and hypoxia guard.
- Electronic anesthesia ventilator for adult usage
- Breathing circuit (02 nos. each) for adult patient
- Vaporizer sevoflurane, Halothane, Isoflurane -anyone
- Circle Absorber.

G. Medical Grade DEFIBRILLATOR with ECG Monitoring, with integrated adult paddles.

H. ICU Ventilator for adult Applications with modes eg SIMV, CPAP and PEEP.

I. The system shall be supplied with following

- Stethoscope, laryngoscope, LMA, CPR patient bed & trolley with IV stand, Resuscitation cart, Resuscitator, torch and nerve stimulator
- The firm must supply one cylinder each for oxygen CO2, Nitrogen and N2O and must supply Air Compressor

J. THE SYSTEM SHOULD ABLE TO DEMONSTRATE FOLLOWING FUNCTIONS

1. AIRWAY SYSTEM

- Mannequins should provide automatically realistic oropharynx ,naso -pharynx and larynx representing adult patient
- Should allow direct laryngoscopy, oral and nasal tracheal intubation.
- Should support mainstream endobronchial intubation, esophageal intubation.
- Should allow for activation of laryngospasm activator & airway occluder to create "cannot ventilate, cannot intubate" crisis scenario.
- Should allow instructor to activate tongue swelling of varying degrees.
- Should support the use of lighted stylets and fiber optic intubation tubes.

- Should be able to perform following airway skills
- Controllable open / closed airway, automatically or manually controlled
- Suctioning (Oral and Nasopharyngeal)
- Bag mask ventilation
- Orotracheal intubation
- Nasotracheal intubation
- LMA placement
- Endotracheal tube intubation
- Retrograde intubation
- Fiber-optic intubation
- Transtracheal jet ventilation
- Light wand intubation
- Needle cricothyrotomy
- Surgical cricothyrotomy
- Variable lungs compliance according to physiological condition and should be stepless
- Variableairway resistance according to physiological condition and should be stepless
- Stomach distention shall be possible

2. PULMONARY SYSTEM

- The patient should breathe spontaneously with a self regulated rate and tidal volume sufficient to maintain a target arterial carbon dioxide which can be adjusted by the instructor.Normal and abnormal breath sounds shall be present
- Oxygen Saturation and plethysmogram shall be displayed on the clinical patient monitor
- Bilateral chest tube insertion shall be possible
- Should be capable of simulating events such as atelectasis,pneumothorax,asthma, COPD etc.
- The mannequin's lungs should physically consume O2 ,produce Co2 and uptake or excrete N20,sevflurane, isoflurane, and halothane and should be displayed on a clinical monitor
- Independent control of left & right lung to model airway resistance, lung compliance, as well as control of chest wall compliance. Bilateral and unilateral chest rise and fall shall be possible

- The lungs should be realistically modeled with respect to the range of tidal volumes & functional residual capacity.
- Should have facility facility to superimpose modes of ventilation (spontaneous, assisted & mechanical) one on another and respiratory system should be capable of triggering a ventilator.
- Ventilation should result in appropriate production of expired CO2, which registers correctly on external capnograph.
- Ventilation should result in appropriate production of expired CO2, which registers correctly on external capnograph.
- Should give appropriate & dose dependent pulmonary response to intravenously injected drugs to continuously Calculate patients arterial blood gas & PH to continuously Calculate patients arterial blood gas & PH

3. CARDIO VASCULAR SYSTEM

- Should simulate heart sound synchronized to QRS complex of ECG, generate 5 lead ECG from appropriate positions on the patients chest and Should be able to simulate associated abnormalities such as myocardial ischemia, sinus tachycardia &bradycardia, ventricular fibrillation &asystole.
- An extensive ECG library shall be available and should change automatically according to physiological response of patients
- 12 lead dynamic ECG display shall be possible on a simulated monitor and printout of the same should be possible
- Should have palpable carotid, radial, brachial, femoral pedal pulses synchronous to ECG.
- Should have independent control of left & right radial, brachial, femoral & pedal pulses.
- Should simulate hypovolemia& hypervolemia and right and / or left heart failure.
- Should be able to simulate patients blood pressure that can be measured with cuff of NIBP Monitor, and provide monitoring of haemodynamic parameters.
- Blood pressure shall be measurable manually by auscultation of Korotkoff'ssound And automatically through clinical monitor (left arm)
- Pulse strength shall be related to blood pressure

4. METABOLIC SYSTEM

- Should physiologically model Actual blood gases including pH, Pco2, Po2 accurately corresponding to alveolar concentration of CO2 & O2.
- Should allow instructor to adjust ABG pH level to simulate Metabolic Acidosis and alkalosis

5. GENITO URINARY SYSTEM

- Mannequin should allow insertion of urinary catheters, & offer instructor controlled or automatic scenario controlled excretion of urine and its flow rate.
- Bowel sound shall be available via speakers
- Should have interchangeable genitalia

6. NEUROLOGIC SYSTEM

- Adult mannequin should model cardio vascular & respiratory responses to sympathetic &para sympathetic activities.
- Adult mannequin should have electrode attachment for peripheral nerve stimulator.
- Adult mannequin should automatically detect PNS stimulus pattern and generate appropriate thumb twitch response.
- Should have a EEG simulator and TDCS simulator.
- Should show a sample atleast 12 ch EEG on an external TDCS EEG system
- Should be able to connect to TDCS EEG to demonstrate TDCS, TACS, TRNS and Sham stimulation.
- Should show flow of current between the electrodes in a head model
- Should also show spectrogram, spectogram plot, cortical map scalp map, spectrum plot.
- Should also show convulsion
- Should show flow of current between the electrodes in a head model
- Should also show spectrogram, spectogram plot, cortical map scalp map, spectrum plot.

7. ADVANCED CARDIAC LIFE SUPPORT SYSTEM

- Should display alveolar & arterial gas concentrations appropriately reflecting efficacy of ventilatory technique employed.
- Should display artificial circulation, cardiac output, Central & peripheral blood pressure, palpable pulses & CO2 return as a result of effective chest compression.
- Should have facility to select & maintain desired cardiac Arrhythmia and central patients response to clinical intervention.
- Should have facility to apply conventional & automatic external defibrillators to the patient and should trigger appropriate patient response and should be viewable on a clinical monitor
- Should have provision to apply transcutaneous pacemakers and pacing & capture should be possible
- Should support all drug required by ACLS algorithm.

8. TRAUMA FEATURES

- Should simulate constriction & dilation of pupils of each eye in response to changing light stimuli.
- Eyes shall include blinking include slow, normal and fast
- Eye movement shall be electronically controlled causing sensors to enter movement information into an event log
- Pupil shall be synchronous and asynchronous
- The manikin shall display convulsions
- Should have provision to perform needle decompression of Tension Pneumothorax, & chest tube placement and management.
- Vital signs shall automatically respond to bleeding and therapy events
- Should have facility to perform subxyphoid needle peri-cardiocentesis to resolve acute cardiac tamponade.
- Right arm shall have IV access
- IO access shall be possible via tibia and sternum

9. PHARMACOLOGY & DRUG RECOGNITION SYSTEM

- Should have preprogrammed pharmacokinetic and pharmacodynamic parameter for over 50 (fifty) intravenous medications.
- Should incorporate various intravenous access points such as antecubital, right internal jugular and femoral veins in the mannequin.
- Should have facility to administer injection & intravenous infusions from main PC console or instructors hand held remote control.
- Mannequin should appropriately & automatically respond to correct and in correct medications.
- Should have drug recognition system to identify drug, its concentration & quantity of dosage given.
- Should have facility to modify/editpharmacodynamic& pharmacokinetic models of existing drugs & to add new drugs.

10.Anesthesia Ventilation system

- Ability to administer anesthetic agents and medical gases through medical grade anesthesia machine and response of gases should be automatic based on patient physiology.
- Lungs should consume oxygen and produce carbon dioxide in real time which can be checked by a capnogram.
- Uptake and distribution of nitrous oxide and volatile anesthetics
- Direct gas exchange within the lungs
- Mechanical ventilation fully supported with automatic responses to CPAP, PSV, PEEP, SIMV, assist control modes and weaning protocols
- Simulator should flow trigger or pressure trigger a ventilator to cycle
- Simulator should be configured to fight the ventilator
- Expired carbon dioxide should be automatically based on patient condition and interventions

11. PATIENT PROFILES & SCENARIOS

- Should have at least 25 pre-configured profiles of patients of various ages, medical history, gender & physiological parameter
- Should have facility to change existing patient profiles and to create new patient profiles.
- It should be possible to capture the current state of patient at any part of simulation session & to use it as new patient.
- Simulator should have at least 50 pre-configured scenarios of events & crises.
- Should have facility to change existing scenarios and to create new scenarios of events & crises

Adult Simulator must include minimum of the following preconfigured Scenarios.

Anesthesia

- Aortic Cross Clamping
- Anaphylaxis in Awake Patient

- Cannot Intubate, Cannot Ventilate
- Cardiac Tamponade
- Emergence Apnea
- Emergence Hypertension
- Emergence with Laryngospasm
- Emergence with Negative Pressure Pulmonary Edema
- Total Spinal Anesthesia
- Local Anesthetic Toxicity During IV Epidural Injection
- Sympathectomy due to Epidural Anesthesia
- Hypoxia due to Bronchospasm During Induction of Anesthesia
- Hypoxia due to Atelectasis in the Obese Patient During Laparoscopy
- Malignant Hyperthermia Under General Anesthesia
- Tension Pneumothorax
- Peripheral Nerve Block Complications
- Anesthesia Machine Failure
- Anaphylaxis Under General Anesthesia
- Awareness During Caesarean Section
- Perioperative Anterior Myocardial Infarction

Obstetric

- Amniotic Fluid Embolism
- Epidural Analgesia
- Pulmonary Aspiration
- Supine Hypotension Syndrome
- Obstetrics Venous Air Embolism
- Pre-Eclampsia

Allied Health conditions

- Angina with Cardiac Arrest
- Asthmatic with Pneumothorax
- Chronic Obstructive Pulmonary Disease (COPD) with Respiratory Failure
- Heart Failure with Pulmonary Edema
- Inferior Myocardial Infarction
- Organophosphate Exposure
- Pneumonia with Septic Shock
- Severe Young Asthmatic
- Splenic Rupture with Pneumothorax
- Stab Wound to the Chest
- Subdural Hematoma
- Anaphylaxis
- Anterior Myocardial Infarction
- Tension Pneumothorax

Advanced Cardiac Life Support (ACLS)

- ACLS Acute Coronary Syndrome
- ACLS Acute Stroke
- ACLS Asystole
- ACLS Bradycardia and Heart Blocks
- ACLS Pulseless Electrical Activity
- ACLS Pulseless Ventricular Tachycardia and Ventricular Fibrillation
- ACLS Respiratory Arrest
- ACLS Supraventricular Tachycardia
- ACLS Ventricular Fibrillation AED
- ACLS Ventricular Tachycardia

Advanced Life Support (ALS)

- ALS Acute Coronary Syndrome
- ALS Acute Stroke
- ALS Asystole
- ALS Bradycardia and Heart Blocks
- ALS Pulseless Electrical Activity
- ALS Pulseless Ventricular Tachycardia and Ventricular Fibrillation
- ALS Respiratory Arrest
- ALS Supraventricular Tachycardia
- ALS Ventricular Fibrillation
- ALS Ventricular Tachycardia

K. Web-based Digital Video & Audio Management System for Recording, Debriefing Assessment and Evaluation

- Web based digital video and audio management system for integration and synchronization of simulation exercise including physiological data logs, event logs, pharmacology data logs and patient monitoring data from multi simulators providing complete record for debriefing assessment and evaluation.
- System Software with following specification: Should have all in one web -based software application that includes all center management features on one platform without requiring user licenses, site licenses or add-on software modules.

Software should include

a) Recording
b) Review
c) Reports
d) Case Manager
e) Activities
f) Calender
g) Schedules
h) Resource Manager
i) User Manager
j) System Manager
k) Lightweight directory access protocol LDAP integration

Streaming

a) Should be able to live broadcasts with industry leading latency (<1sec)
b) Should have facility to connect up to 4 concurrently displays and synchronized, camera streams, plus 1 simulator in each room
c) Should be able to show Live stream videos to any number of remote sites
d) Widescreen HD video broadcast and recording, full screen mode
e) On-screen PTZ controls: click on image to pan and tilt, drag image to zoom in and out; from multi or single room views
f) DVR-type functionality to pause, rewind, and forward; even during live recording

Record

a) Full camera control (pan/tilt/zoom) from both live(single room) and a center overview (all rooms)available in-browser from any client workstation

b) Pause live or recorded view and continue where you stopped ("time shifted live view")

c) Manually start / stop recording or set recording to occur, based on a schedule or on user actions d) Save and restore custom layouts of the simulation/exam room views including size and positioning of individual video streams per room

Review

a) Immediate access to recorded data in order to review complex recordings of all camera, simulator, and peripheral device feeds assigned to the room

b) Access and control all recorded videos on one page (debriefing, deleting, downloading, renamingor reassigning videos)

Assess

a) Intuitive interface for creating custom checklists / rubrics for Learners, Faculty or SPs

b) Faculty / Staff can complete user-customized assessment rubrics, while watching live or recorded video

c) "What you see is what you get" content editor for the easiest, most streamlined, checklist-building process ever

d) Learners can interact with a variety of the data entry (i.e. SOAP Note, Step II CS write-up, handoff note, etc.)

e) Case evaluation, as well as, self and peer evaluations
f) Control Learner data entry with timer Faculty / Staff can grade any write up or short answer question, submitted by Learners
g) Standardized Patients can complete checklists, assessing the Learners, as well as each other
Search, preview, and have the ability to reuse all questions
Report
a) Generate and export custom reports, covering both the group and individual performance, or use one of the many predefined report options
b) Give Learners access to their reports at home or on campus
c) Export data from system to work with outside of system (excellent system for researchers)
d) Review Faculty and Standardized Patient performance reports for quality assurance and consistency
e) Follow Learner progress in key skill areas, throughout their career, within your program
Activities
a) All activity cases, event dates, times, and rooms at one glance
b) Define participant groups (Learners, Faculty, SPs) with a quick link to add new group
c) Link Activities to Calendar events, for a first glance overview on the daily / weekly / monthly program
d) Allow Faculty to submit booking requests for specific room / resources within the simulation
center, to be managed by center administration
e) Assign resources, activities and participants to onetime or recurring calendar events
Manage
User management tools; with the ability to define roles, access privileges, and group memberships b) Batch upload large groups of users at once
c) Email notifications for Learners and SP's to choose preferred sessions, in times that are
indicated / available for assessments
d) Advanced scheduling capabilities, to automatically adjust station schedules and extend rotations, asp and learner availability changes
e) Pre-scheduled recording, start / stop times, and intercom announcements, to coordinate with a pre- defined exam schedule, for a fully automated recording system
Track
a) Track the use of simulation center resources (rooms, simulators, personnel, etc.) by client
b) Generate reports quarterly / by semester / yearly
c) Generate and export utilization and allocation reports (tools to justify expansion, funding, etc.)
Integrate
a) Connect with any patient simulator to capture 360ºlive simulation data
Connect any simulated or real patient monitor for capturing and broadcasting HD screen image
b) Optical character recognition, to turn the video signal from monitor into real-time data streams, for visual trend charts and searchable physiological data
c) Use predefined layouts or define your own, for identifying key captured values on the connected screen
d) Remote site configurations
Access / Security
a) LDAP is a standard feature without requiring a module site license
b) LDAP authentication through your active directory, automated way of importing or updating user accounts from an LDAP directory service LDAP for SSO (Single Sign-On) remove the requirement to maintain multiple passwords for users.
c) Authenticate users in system against an LDAP directory
d) Shibboleth for SSO (Single Sign-On): authenticate users against a Shibboleth service, to provide single sign-on capabilities, without the requirement for multiple passwords
e) View any configured rooms with signed SSL certificates for secured connection
Technical specification
Should offers a 1:1 ratio between recording areas, simulator and recording appliances with the following built-in components:
a) Should be able to simulate record up to 3 video sources (2 cameras + 1 monitor)
d) Should have Input of 1 VGA, DVI or HDMI video source
e) Should have WiFi connection to simulators
f) Should have Input for institution network cable
g) Should have Built-in digital audio kit
h) Should have Input for a secondary microphone
i) Should have Built-in speaker to broadcast in-room intercom announcements

j) Should have 1,000 hours of HD video recordings
k) Should have Pre-configured with briefing and debriefing software
l) System should be supplied with a latest configuration laptop with two digital PTZ cameras
m) System should be supplied with 32" HD LED Display
n) Demonstration of the quoted model is mandatory within 15 days of release of demo letter
o) Bidder should have minimum 5 working installation of quoted model in India order copy and performance certificate for the same should be attached.
ANNEXURE 2 **Technical Specifications for Wireless Paediatric Patient Care Simulator**
GENERAL FEATURES:
1. The simulator mannequin must be anatomically correct to replicate a real life sized paediatric patient with anatomical landmarks.
2. The simulator must have functional pupils that blink and have simulated eyes which automatically react to light
3. The simulator must have automatic physiology response models that can objectively confirm airway management without the need for visual observation by an instructor
4. The simulator must have a hematology model for hemorrhage control showing the impact of progressive blood loss and compensation to the patient in real time
5. The simulator must have the capability to integrate a blood / secretions flow model for representation of trauma conditions to the patient
6. The simulator must have automatic physiological and pharmacological response models with responses to reflect the actual effects of the drug or multiple sets of drugs
7. The simulator and its accompanying components must be portable and easily stored when necessary.
8. Simulators eyes must be able to display patient symtoms and conditions including conditions including jaundice, hemorrhage , keyhole pupil, cataract , blood shot or droopy eyes.
9. The simulator must include a simulated patient monitor which has the capability to display the parameters below in addition to custom configurations • ECG I, II, III and V and heart rate • Arterial Blood Pressure • Pulmonary Artery Pressure • Pulmonary Capillary Wedge Pressure • Central Venous Pressure • Mean Arterial Pressure • Non Invasive Blood pressure • CO2 Capnography • SPO2 • Heart rate • Thermolidution cardiac output and continuous cardiac output • Blood temperature • Body temperature
AIRWAY
1. Simulator must have a life like intubation head with a flexible tongue, epiglottis, aryepiglottic fold, cuneiform tubercle, corniculate tubercle ,laryngeal inlet, vocal cords , esophagus and simulated lungs for spontaneous breathing and realistic chest movement and compressions, substernal retractions
2. Simulator must have tracheal access through the neck for cricothyrotomy ,tracheostomy
3. Should support mechanical ventilation for asynchronous volume and pressure controlled ventilation
4. Should support PEEP upto 20 cm H2O)
3. The simulator must have the following standard ALS airway skills: • Bag/ valve/mask ventilation • Oral intubation • Nasal intubation • Esophageal intubation • Combitube placement • LMA Placement • Retrograde intubation • Fiber optic intubation • Light wand intubation • Cricothyrotomy • Oropharyngeal and nasopharyngeal airway placement • Jaw thrust
4. Exhaled CO 2 Flow to confirm placement of airway devices with in the trachea

5. Signs of spontaneous respiration to include:

- Independent right and left chest movement
- Exhalation of air from mouth
- Exhaled CO2 Capability.

6. Simulator must have a respiratory rate that is physiologically modeled or may be manually controlled by an instructor.

7. The simulator must be able to accommodate the following airway features:

- Pharyngeal obstruction
- Multiple levels of swollen tongue
- Laryngospasm
- Left & right broncheal obstruction
- Stomach decompression
- Cannot intubate, can ventilate
- Cannot intubate, cannot ventilate

CARDIOVASCULAR SYSTEM:

1. The simulated patient should generate heart sounds including a range of pathological ones which are synchronized to the QRS complex of the ECG and should be audible with a standard stethoscope over the left and right upper sternal border, left lower sternal border and apex.

2 The simulator must have an integrated IV training arm with replaceable skin and veins, IV insertion into peripheral veins of forearm, anticubital fossa and the dorsum of the hand, simulated blood flash back on cannulation, IV Bolus or infusion.

3. 5 Lead ECG capability emitted from the appropriate positions on the patient's chest for display on a standard monitor

4. Palpable carotid, radial, brachial, femoral, popliteal and pedal pulses which are synchronous to the ECG.

5. Simulator pulses must be dependent on BP of the patient and must be independently Controlled on left & right side of the body

6. A standard blood pressure cuff and sphygmomanometer can be used to assess systolic blood pressure by palpation or by auscultating Korotkoff sounds.

7 The invasive hemodynamic monitoring package should provide the capability to measure and monitor the following:

- Arterial blood pressure
- Left ventricular pressure
- Central venous pressure
- Right atrial pressure
- Right ventricular pressure
- Pulmonary artery pressure
- Pulmonary artery occlusion (wedge) pressure
- Thermodilution cardiac output

TRAUMA FEATURES:

Simulator must have the ability to perform the following trauma functions:

- Bi-Lateral Pneumothroax needle decompression
- Bi-lateral chest tube placement
- Blinking eye with light reactive pupils
- Circumoral cyanosis

IV DRUG ADMINISTRATION:

1. Simulator must have an intensive drug library that includes ACLS drugs.
2. The simulators response to drugs administered must be automatically linked to physiology and will not rely on manual input.

CARDIAC FUNCTIONS:

1. The simulator package must include an ECG library that contains an extensive library of physiological modeled cardiac rhythm variations
2. The simulator must be able to accommodate the following:

- Live defibrillation from an AED and a manual defibrillator
- Cardiac monitoring with blood pressures and cardiac output
- 5 Lead ECG Monitoring
- External pacing with various pacing threshold
- Produce chest compression artifacts on ECG
- Show a displayed heart rate and ECG on a compatible simulated monitor

BLOOD PRESSURE:

1. The simulator must have a blood pressure that can be taken either automatically, by auscultation or palpated.
2. The simulator must include a blood pressure arm that has Korotkoff sounds, which can be used for auscultation and palpation of the blood pressure.
3. The blood pressure must be able to be displayed on a compatible simulated monitor.

GENITOURINARY

1. The simulator must include both male and female genitalia which are interchangeable and anatomically correct
2. The genitalia must have the ability to be catheterized with the ability to produce urinary output.
3. Should allow enema insertion

NEUROLOGIC SYSTEM

1 Should model Cardiovascular and respiratory responses to sympathetic and parasympathetic activities
2 Should be able to simulate seizures.
3 Should have pain response through sternal rub

ADVANCED CARDIAC LIFE SUPPORT (ACLS) SYSTEM

1 **Airway Management and Ventilation:** Alveolar and arterial gas concentrations should appropriately reflect the efficacy of the employed ventilatory technique, such as mouth-to-mouth, bag-valve-mask, endotracheal intubation and transtracheal catheter ventilation. Administration of supplemental oxygen should extract automatic and appropriate patient clinical responses.

2 **Chest Compression: Should allow chest compression** In accordance with ACLS guidelines, effective chest compression of the patient's sternum should result in artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses and CO2 return and Pressure fluctuations should be visible on invasive catheter waveforms..

3 Cardiac Arrhythmias: The instructor should be able to select and maintain a desired arrhythmia and control the simulated patient's response to clinical interventions.

4 **Electrical Therapy:** Both conventional defibrillators and automatic external defibrillators (AEDs) can be applied to the simulator generating appropriate patient response in real-time. Capable of applying transcutaneous pacemakers

5 **Pharmacological Therapy:** All IV drugs required by the ACLS algorithms should be supported.

SOUNDS AND PHONATION:

The simulator must have the ability to produce the following sounds:
Speaking through the instructor microphone

- Heart sounds which are synchronized with the ECG
- Independent left and right sounds
- Bowel Sounds
- Heart, lung and bowel sounds auscultated with a stethoscope.
- Independent volume adjustment

PATIENT & SCENARIOS

- Should be delivered with pre-programmed patients. System should have patient editor software to edit/ modify preconfigured patient profiles or to create new patient profile.
- Should be delivered with pre-programmed scenarios. System should have scenario editor software to edit/ modify preconfigured scenarios or to create new scenario.
- At any point during a simulation session it should be possible to capture the current state of a patient which can be used as a new patient.
- Should be capable of running multiple patients simultaneously to create multiple patient care simulations

EVENT LOG:

1. The simulator must include physiological, pharmacological event data that is logged and timed stamped.

2. The log must automatically calculate and log the following items:

- Alveolar and blood gases
- Cardiac Output
- Heart rate
- SPO2
- Invasive blood pressure
- Hematocrit and hemoglobin values
- Temperatures

3. The event long must be able to be saved and printed.

CONTROL SYSTEM :

Control system should be comprised of

- Instructors wireless remote control capable driving all software programme
- Instructor wireless remote control must be expandable for future software up-gradation.

The system shall be supplied with Stethoscope, Laryngoscope, LMA, Patient bed with IV stand, Resuscitation cart, Resuscitator Bag.

K. Web-based Digital Video & Audio Management System for Recording, Debriefing Assessment and Evaluation similar to that for adult system

- Web based digital video and audio management system for integration and synchronization of simulation exercise including physiological data logs, event logs, pharmacology data logs and patient monitoring data from multi simulators providing complete record for debriefing assessment and evaluation.
- System Software with following specification: Should have all in one web -based software application that includes all center management features on one platform without requiring user licenses, site licenses or add-on software modules.

ANNEXURE 3

Technical Specification for Ultrasound Training Simulator

Training Modules:

- **Trans Esophageal Echocardiography – TEE** : System should have at least 30-40 basic task training exercises for students such as:
  a) Basic Probe Movement & Orientation: Time bound exercise, with/without the aid of reference image to help understanding of basic probe handling and movements with metrics.
  b) Setting, Adjustment: Facilitate trainees to optimize best image settings for different views, with adjustments of DOF, Beam angle, Gain & Contrast. Expert can verify the outcome after completion of exercise.
  c) Target Cut Plane: Trainees recognize standard views with this exercise and after completion expert can evaluate the performance.
- **Transthoracic Echocardiography – TTE**: System should have at least 60-70 basic task training exercises such as
  a) Basic Probe Movement & Orientation: Time bound exercise, with/without the aid of reference image to help understanding of basic probe handling and movements with metrics.
  b) Measurement: Facilitates the trainees to get the idea about how to use different measurement tools, with/without reference image.
- **Abdominal:** System should have at least 10-15 basic task training exercises such as
  a) Basic Probe Movement & Orientation: Time bound exercise, with/without the aid of reference image to help understanding of basic probe handling and movements with metrics.
- **Pleural Module:** The Pleural Add-on Module provides lung pathologies featuring fully animated lung respiration and respiratory variation of the inferior vena cava (IVC)
- **FAST** – (Focus Assessment with Sonography for Trauma) –to see the fluid around several organs in the abdomen includes the perihepatic space, the perisplenic space, the pericardium and the pelvis.

System should have the following features for ultrasound teaching and training:

- System must have distance learning feature with major online meeting platforms.
- System must have capability to allow user to perform remote training and share information with other colleagues from the campus or from different departments.
- System should be capable of allow the faculty to hand over the control to the trainee at remote location for teaching and evaluation.
- System should have capability to offer online training where a trainer can handover the control of scanning to the trainee for remote training and examination skills
- System should offer self – training mode without manikin with or without Hololens to the trainee.
- Simulator must offer the liberty to the trainer to create own ultrasound curriculum to assign the specific group of trainees as per their level.
- Simulator must have the capability that students should be able to interact with holograms of human anatomy as they learn how to obtain ultrasound views and assess patients.
- Capable to improve learning process for students as they study ultrasound and anatomy.
- Facility to Elevate the AR Simulator hologram above the body to demonstrate interrelated circulatory,

respiratory and skeletal structures
• Facility to walk around the manikin to gain different perspectives of the holographic anatomy.
• Facilitates to identification of free fluid using augmented reality 3D depiction of comprehensive anatomy.
• 3D Holograms of anatomy using AR Simulator with HoloLens
• Ability to overlay ultrasound beam on 2D AR animations and "write anywhere on the screen" for interactive education to simplify onsite and remote education.
• Ability to create/compile lessons and categorizing various pathologies and organize lessons.
• Instructor can created Presets, which automatically become training exercises, which learners can perform and save their metrics with that.
• Advanced Echo Report feature which enables instructors to create their own categories
• Manikin-based system that replicates real-time visual, physical and ergonomic attributes of ultrasound scanning
• Palpable thoracic and pelvic bony landmarks that with motion tracking system that allows 6 degrees of freedom (DOF) to align physical manikin with virtual anatomy in software
• 2D, Bi-Plane and M-Mode Views
• Color Doppler, Continuous Wave Doppler and Pulsed Wave Doppler of the Heart
• 3D animated augmented reality feature shows ultrasound beam and target structures.
• Spilt screen display with corresponding 2D image.
• 3D/4D ultrasound for improved assessment and diagnosis by full volume outside image of organs parts.
• 4D Ultrasound with MPR (Multiple Planer Reconstruction) for improved assessment and diagnosis with different views on single screen.
• MPR (Multiple Planer Reconstruction) supports different cut planes at the same time. User or trainee can easily change the angles of the planes as required for improved assessment and diagnosis.
• 3D and 4D Ultrasound with MPR must allow user could create their own 3D preset for their curriculum and training.
• Detailed labeling features allows the user to break down every tiny detail of the heart to learn anatomy are also available with Augmented Reality (AR) images for better understanding of anatomy and self-learning.
• Detailed labeling features works in not only Normal heart but also other cardiac pathologies too on simulation screen.
• Realistic scanning environment(Apart from heart it should renders the liver, ribs, sternum, superior and inferior vena cava, aorta, lungs and vertebral bodies.
• Surrounding anatomical structures (i.e. liver, lungs, and sternum artifacts) are displayed and may be toggled on and off depending on learner's level of comfort.
• Software includes tutorial features to help users identify anatomical structures on augmented reality display.
• Heart rate can be modified on the fly.
• Includes single lead ECG tracing.
• Target Cut Plane feature allows learners to visualize corrects probe positioning.
• Matrix for evaluation of student's performance
• 3D view includes animated display of organ being scanned, surrounding structures, and 360° view
• Augmented reality shows 16 segments of the heart chamber
• Lung and rib artifacts can be toggled on/off
• Ability to load pathologies in stealth mode to hide the name of the pathology from learners
• Software includes tutorial feature to help users identify anatomical structures
• Software includes supporting content for pathologies such as case presentations, medical references.
• Tutorial Feature
• Ability to help learners identify structures with labeled anatomy
• Ability to freeze the view
• Self-directed learning tasks include: probe manipulation, obtaining standard views, optimizing image settings and performing measures
• Metrics, reports, images, and video captures may be exported to a USB storage device
• Multimedia ICCU course on point of care ultrasound included with the simulator.
• Mannequin should have ability to be placed in the tilted left lateral decubitus position.
Realistic Echo Environment:
• Electronic calipers
• Area measurements
• Contour Measurement
• Circumference Measurement
• Gain and contrast settings
• Depth of field adjustment
• Angle Settings

System must have following Cardiac Pathologies:
• Dilated Cardiomyopathy – Severe Biventricular Systolic Dysfunction
• Hyperdynamic Left Ventricular Systolic Function
• Normal Heart
• Recent Anterior Myocardial Infarction with Pericardial Effusion
• Anterior Myocardial Infarction in a COPD Patient
• Biologic Prosthetic Valve in Aortic Position
• Dilated Cardiomyopathy – Mild Left Ventricular Systolic Dysfunction
• Dilated Cardiomyopathy – Very Severe Left Ventricular Systolic Dysfunction in a COPD
Patient
• Left Pleural Effusion
• Left Ventricular Apical Aneurysm with Thrombus
• Mechanical Prosthetic Valve (Bileaflet) in Aortic and Mitral Position
• Mechanical Prosthetic Valve (Tilting Disk) in Mitral Position
• Normal Heart in a COPD Patient
• Tamponade
• Acute Anterior Myocardial Infarction
• Acute Lateral Myocardial Infarction in a COPD Patient
• Aortic Valve Infective Endocarditis
• Coarse Ventricular Fibrillation
• Dilated Cardiomyopathy – Very Severe Left Ventricular Systolic Dysfunction
• Dilated Cardiomyopathy – Mild Left Ventricular Systolic Dysfunction in a COPD Patient
• Coarse Ventricular Fibrillation
• Fine Ventricular Fibrillation
• Pulmonary Hypertension
• Pulmonary Hypertension in a COPD Patient
• Acute Inferior Myocardial Infarction
• Acute Lateral Myocardial Infarction
• Acute Right Ventricular Myocardial Infarction
• Aortic Dissection – Type B
• Aortic Stenosis - Valvular
• Ballooning Mitral valve – two leaflets
• Bicuspid Aortic Valve
• Dilated Cardiomyopathy – Severe Left Ventricular Systolic Dysfunction
• Myxoma
• Right Pleural Effusion
• Acute Inferior and Right Ventricular Myocardial Infarction with Ventricular Septal Defect
• Acute Inferior Myocardial Infarction with Right Ventricular Myocardial Infarction
• Aortic Insufficiency
• Atrial Septal Defect - small
• Ballooning Mitral Valve
• Cardiac Arrest Standstill in a COPD patient
• Coronary Artery Disease – Wall Motion Abnormalities in the 3 Coronary Territories
• Dilated Cardiomyopathy – Moderate Biventricular Systolic Dysfunction
• Left Atrial Appendage Thrombus
• Thrombus in Transit Patent Foramen Ovale
• Amyloidosis
• CMP – Dilated
• CMP – Hypertrophic
• Ebstein's Anomaly - ASD
• LV Apical Thrombus
• Mitral Valve Prolapse
• Mitral Valve - Rheumatic Disease
• Myxoma
• Takotsubo
• VSD (CIV) Post-Infarct
• Abdominal Compartment Syndrome
• Dynamic Right Ventricular Outflow Tract Obstruction
• Floating Pulmonary Embolism
• Full Stomach
• Inferior Vena Cava Stenosis
• Isolated Right Arterial Tamponade
• Left Ventricular Outflow Tract Obstruction

• Mechanical Right Ventricular Outflow Tract Obstruction
• Reduced Mean Systemic Pressure (Reduced Preload) From Liver Abscess
• Reduced Mean Systemic Pressure (Respiratory Variation Of Superior Vena Cava
• Right Pneumothorax And Right Heart Collapse
• Right-sided Carbon Dioxide Or Air Embolism
• Right Atrium Tamponade
• Severe Hypovolemia
• LVOT Obstruction LVH Post AVR
• Acute RV Failure
• Air Embolism
• Extensive Myocardial Ischemia
• Aortic Dissection
• Large Cardiac Mass
• Acute MR Post AVR
• Prosthesis Dysfunction Post MVR
System must have following Lung Pathologies:
• Bilateral Diaphragmatic Dysfunction
• Bilateral Pulmonary Edema
• Central Pneumonia
• Complete Pleural Effusion
• Empyema
• Pneumonia
• Pneumothorax
• Small Pleural Effusion
• Unilateral Diaphragmatic Dysfunction
System must have following Abdominal Pathologies:
• Normal Abdomen
• Hydatid Cyst of the Liver
• Multilocular Intra-Abdominal Abscess
• Liver Hepatocellular Carcinoma Hypoechoic
• Acute Cholecystitis
• Angiomyolipoma
• Bacterian Hepatic Abscess
• Cholecystitis with Gallstone
• Choledocolithiasis
• Exophytic Renal Cyst
• Hepatomegaly
• Kidney Stones
• Pancreatic Pseudocyst
• Splenomegaly
• Chronic Pancreatitis
• Gallbladder Polyp
• Hepatic Haemangioma
• Hepatic Heterogeneous Metastases
• Hepatic Homogeneous Metastases
• Hepatic Steatosis
• Large Gallbladder Polyp
• Renal Cyst
• Splenic Cyst
• Splenic Haemangioma
• Bochdalek Hernia - Left Side
• Cholelithiasis
• Gallstones
• Hepatic Cirrhosis with Portal Hypertension
• Liver Hepatoma
• Heterogeneous Lesion
• Pancreatitis
• Pyelonephritis
• Renal Abscess
• Renal Cyst Rupture
• Schlerosing Cholangitis
• Adenocarcinoma of the Gallbladder
• Bochdalek Hernia

• Calcified Granulomas
• Focal Nodular Hyperplasia
• Hepatic Cirrhosis
• Hepatic Cirrhosis with Ascites
• Left Hydronephrosis
• Liver Adenoma
• Liver Hepatocellular Carcinoma Hyperechoic
• Liver Hepatoma Hyperechoic Lesion (Large)
• AAA - Medium Suprarenal
• AAA - Small Renal
• AAA - Medium Renal
• Left Iliac Artery Aneurysm
Each AAA pathology has the following modality options that can be turned on and off:
• Digestive system gas
• Dissection
• Free fluid
• Mural Thrombus
• Pericardial Fluid
System must have following FAST Pathologies:
• Free Fluid - Hepato-Renal Reflection (Morrison's Pouch - Small)
• Free Fluid - Retro-Vesical Reflection (Large)
• Free Fluid - Splenal-Renal Reflection (Medium)
• Free Fluid - Retro-Vesical Reflection (Small)
• Free Fluid - Retro-Vesical Reflection (Medium)
• Free Fluid - Splenal-Renal Reflection (Small)
• Free Fluid - Supra-Splenal
• Free Fluid - Above the Spleen with Hemothorax
• Free Fluid - Bilateral Renal Reflection (Small)
• Free Fluid - Hepato-Renal Reflection (Morrison's Pouch - Large)
• Left Lateral Trauma
• Spleen Rupture
• Small Pericardial Effusion
Basic Equipments(Hardware):
• Mannequin
• Laptop
• Transducers: a) Phased Array Transthoracic Echocardiography (TTE) Probe
b) Trans Esophageal Echocardiography (TEE) Probe
c) Curvilinear Probe (For FAST, Abdomen & Pleural Modules)
• Wi-Fi Router for AR
• Microsoft Hololens (Qty. 2)
• Trolley for Mannequin
Mannequin: Should have realistic tactile features for enhance learning, depressible abdomen, palpable ribs and sternum & depressible interspaces. Should have ability to be placed in the tilted left lateral decubitus position
Downloadable Software Upgrades:
• Capable of downloading automatic software updated from the central server.
Should be supplied with following interventional simulation models
1 **Ultrasound central line training model**
• Model should have ultra-durable tissue should be realistic in ultrasound imaging characteristics, feels and cannulates like real human tissue
• Should be realisticcentral venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated with ultrasound guided central venous access procedures
• Should have ultra-durable self-healing tissue, extremely realistic in ultrasound imaging characteristics and feels like real human tissue
• Should contain anatomically correct vascular anatomy of the right upper thorax and neck including internal jugular vein, brachiocephalic vein, subclavian vein, axillary vein, carotid artery, subsclavian artery, and axillary artery as well as anatomical landmarks including the trachea clavicle the two head of the sternocleidomastoid muscle manubrium and the sterna notch
• Positive fluid flowin the vessels should provide users with immediate feedback when vessels are accessed
• Simulated blood fluids in the arterial vessels should differ from the venous system allowing for user to easily verify successful venous access procedures
• Tissues shouldmatch ch the acoustic characteristics of real human tissue.

• Arterial pulsation are simulated using a provided integrated automated pumping system
• Replacement part should be supplied for atleast 1000 procedures.
2) Femoral Vascular Access Lower Torso Ultrasound Model with DVT Option
• Realistic and ultra durable femoral vascular access ultrasound training model excellent for radiologists in the psychomotor skills associated with ultrasound guided procedure
• Superb ultrasound imaging characteristics
• Ultra-durable self healing tissues which should be realistic in ultrasound imaging characteristics and feels like real human tissue
• Anatomically correct vascular anatomy of the right lower torso including the femoral artery and vein should be provided.
• Anatomical landmarks of the lower torso should be there
• Ability to use traditional anatomical landmarks for blind insertion techniques, or ability to use ultrasound to obtain images of anatomical structures
• Should allow full threading of guidewires and catheters
• Venous and arterialfluids that are removed during central catheter insertions training should be easily refilled using quick fill ports
• Arterial pulsations system should be simulated using an integrated automated pumping system
• Positive fluid flow in the vessels should be there.
• Simulated blood fluids in the arterial vessels should be different from the venous system.
• Tissues should match the acoustic characteristics of real human tissue.
• Deep Vein Thrombosis (DVT) option should be provided.
• Replacement part should be supplied for atleast 1000 procedures.
3) Peripherally inserted central catheters (PICC) with Intravenous and Arterial Line Vascular Access Ultrasound Training model.
• Realistic and ultradurable central venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated withultrasound guided vascular access procedures
• Ultra-durable self-healing tissue realistic in ultrasound imaging characteristics andfeels and fel and cannulates like real human tissue
• Contains the brachial and basilic veins, brachial artery, radial artery, ulnar arterymedial cubital v , and the cephalic vein
• Superb ultrasound imaging characteristics
• Positive fluid flowin the vessels to provide users with immediate feedback whenvessels are access
• Easy to refill simulated vessels
• Tissues match theacoustic characteristics of real human tissue
• Replacement part should be supplied for atleast 1000 procedures.
4) Spinal Epidural, lumbar Puncture and Thoracic Epidural Training Model
• Model for training for lumbar puncture, lumbar epidural and thoracic epidural procedures.
• Should be excellent for blind insertion techniques or using ultrasound for guided lumbar punctured spinal epidural procedures
• Needle access as well as the placement of catheters should be possible.
• Ability to position in the upright or lateral decubitus position allowing users to accurately position the model for appropriate training scenarios
• External landmarks as the iliac crests should be there in the model to initially orient the user to the proper access points
• Palpation of the spinous processes should be possible.
• The accessory obese spinal insert should provide more adipose tissue disallowing the palpation of the spinal processes
• Should be able to utilize for full procedural training including injecting local anaesthetics, intriduce the needle to the epidural space and/or subarachnoid space, thread catheters, infuse simulated anaesthetics, and obtain manometer measurements
• Ultrasound can be used for identification of the optimal insertion points, angle of needle insertion, determination of the depth to the ligamentum flavumepidural space and spinal cistern
• Should have ultra durable self-healing tissue realistic in ultrasound imaging characteristics andfeels like real human tissue
• Replacement part should besupplied for atleast 1000 procedures
5) Paediatric 4 vessel ultrasound training block model
• Model should be ultr- durable and realistic simulated human tissue should be provided
• Should contain four branched vessels ranging in size from 2mm to 6mm
• Should have overlapping blood vessels which are perfect for new users as well as for more advanced technique training
• Model should be pre filled with red simulated blood refill solution
• Should have the ability to inject fluid into the model to verify needle tip location automatically expelled
• Ability to acquire and interpret imaging of vessels used for venipuncture
• Replacement part should be supplied for atleast 1000 procedures

6) Pediatric Regional Anesthesia and Central Line Ultrasound Training Model
• Pediatric upper torso ultrasound central line and regional anesthesia mannequin
• Extremely realistic external and internal anatomy for ultrasound guided or blind insertion training on 6-year-old patient
• Excellent for training clinicians in the psychomotor skills associated with ultrasound guided central line placement training
• Superb imaging characteristics optimize your training; simulated tissue matches the acoustic properties of real human tissue
• Model is for use with any ultrasound system.
• Model should have self-healing tissue offers users tremendous durability – minimizing the need for replacement parts and providing a low cost of ownership
Anatomy:
• Regional anesthesia anatomy includes: supraclavicular nerves, interscalene nerves, infraclavicular nerves and enhanced access of the posterior interscalene nerve block approach
• The brachial plexus can be injected with simulated anesthetics to verify needle tip location and to practice the entire anesthesia procedure
• Injected simulated anesthetics are expelled allowing for repeated use
• Venous anatomy includes: internal jugular vein (IJ), brachiocephalic vein, subclavian vein and axillary vein
• Arterial anatomy includes: carotid artery, subclavian artery and axillary artery
• Simulated superior vena cava, right atrium and right ventricle allows clinicians to fully thread guidewires and catheters without resistance
• Internal landmarks for superior realism include the trachea, manubrium and clavicle
• Veins should be compressible using mild pressure while the arteries remain uncompressed
• Model should have arterial pulsations simulated using provided hand bulb.
• Positive fluid flow in the vessels; model should made available as prefilled with red fluid in the arteries and blue fluid in the veins
• Model should have easy to refill vessels with ultrasound refill solution ports.
• Should have excellent imaging quality using any ultrasound system
• Soft consumable part should be capable of at least 1000 procedures/pricks
ADDITIONAL TERMS & CONDITIONS
1. Single vendor should quote all the above systems of one manufacturer.
2. Bidder will be responsible for integration of centralized classroom management system with simulators.
3. The bidder must have experience in installing at least 3 simulation centers in the country at Govt Institute/Medical College and purchase order copy should be attached.
4. Bidder has to provide a training program with a faculty trained on simulation initially for at least 5 working days at Hospital during installation. (The faculty shall be responsible for training the trainer).Bidder have to train the faculty thrice during the warranty period as per requirement.
5. The simulators should be in functional (95% up-working time).In any case if any repair is needed it should be attend within 48 hours or Hospital will penalize as per the tender clause.
6. Warranty: 5 years (with spares)
7. A necessary three visit per year of company engineer is mandatory in warranty period apart from repair call for calibration. The visit has to be registered in institute Log book, verified by Central store in-charge.
8. Firm must quote cost of CMC for further 5 years .Bidder will be responsible to inform the institute at least 6months earlier for CMC
9. Any software up-gradation on any of simulators has be to done free of cost during the warranty period
10. An undertaking has to be given by supplier that the quoted simulator is of latest technology.
11. Bidder should be Indian agent of the manufacturers for last 03 years and should submit order copy executed by the bidder for the quoted manufacturer/ principal in last three years.
12. The bidder shall be responsible for designing & creating the setup. Institute shall provide space with roof and floor only. Partitions & Floorings have to be done by the bidder
13. Bidder shall have also done all the minor civil & electric work. The preferred make mentioned below: Name of Work — Preferred Makes Flooring vitrified tiles — Somanv, Kaiaria, H&R Johnion etc., or equivalent Paint — Dulux, Asian Paints, Nerolac etc., or equivalent Plumbing — Kohler, Jaguar, Grohe, Roca etc., or equivalent Sanitary items — CERA, Hindware, Parlyware etc., or equivalent Cables — Finolex, Havells, V-Guard etc., or equivalent Box/Storage — Should have storage facility and good quality boxes for manikins Switches — Legrand,L&T, Crabtree, Roma etc., or equivalent Distribution box, MCBO — Legrand, L&T, Siemens, Havells etc., or equivalent Light Fittings — LED only Philips, Crompton Syska, Wipro etc., or equivalent Furniture — Hennen Miller,Godrej, Featherlite, Neelkamal etc, or equivalent Chair- Godrej/Kelly/ Neelkaml etc., or equivalent
14. The Turnkey work for the minimum area of 750 sq. meter and Air-conditioning of the area has to be done by the bidder (4 spilt AC with 1.5 ton each).

15. Bidder has to ensure following things inside the Anaesthesia Simulation (Class room 20 ft x 20 ft) for briefing and debriefing on turnkey basis.
20 chairs, 2 table,1 Podium with mic, 2 cordless mic,1 Projector and Audio Video management system, 1 latest computer (PC) with and 1 printer.

9: Human Patient Simulator (Adult Manikin)

TECHNNICAL SPECIFICATION FOR HUMAN PATIENT SIMULATOR

The human patient simulator should comprise of a life like adult male mannequin, integrated with CPR analysis which must be compliant with at least American Heart Association's 2020 guidelines with correct hand placement, depth and rate of compressions being captured with following specifications:-

1. It should employ multiple models of validated human physiology including cardiovascular system, pulmonary system, neuromuscular system, and central nervous system. The models should allow the patient to exhibit clinical signs (e.g., spontaneous breathing, eyelid blinking) and monitored parameters (e.g., electrocardiogram, blood pressure) and should automatically respond to therapeutic intervention without any/ minimal input from the instructor.

2. The mannequin should be controlled completely wirelessly and should not be connected to any control system/ instructor computer through wires/hoses.

3. The mannequin should have a realistic skeletal structure, providing true-to-life articulated motion.

4. The simulator should have facilities to teach the following skills

a. Intravenous cannulation

b. Head tilt-chin lift, Jaw thrust methodsste

c. Airway skills

- Controllable open / closed airway, automatically or manually controlled
- Suctioning (Oral and Nasopharyngeal)
- Bag-Valve mask ventilation
- Orotracheal intubation
- Nasotracheal intubation
- Combitube placement
- LMA placement
- Endotracheal tube intubation
- Right Mainstream
- Retrograde intubation
- First grade fiber-optic intubation
- Light wand intubation
- Needle cricothyrotom
- Surgical cricothyrotomy

d. External pacing

5. The patient simulator should have a cardiovascular system that automatically calculates dependent variables (e.g., blood pressure, heart rate) in response to changing cardiovascular system status (e.g., bleeding, intravenous fluid administration), including the following: A baroreceptor reflex that compensates both centrally (e.g., heart rate, cardiac contractility) and peripherally (e.g. systemic vascular resistance, venous capacitance) to maintain circulation and perfusion.

B myocardial oxygen supply (e.g., diastolic blood pressure, arterial oxygen partial pressure) and demand (e.g., cardiac contractility, heart rate) that yields appropriate cardiac response (e.g., cardiac rhythm, cardiac contractility) to myocardial ischemia. Untreated myocardial ischemia should automatically result in cardiovascular decompensation with accompanying cardiac rhythms (e.g., ST- segment depression, ventricular tachycardia, ventricular fibrillation, asystole) and ultimately, cardiovascular collapse.

C Arterial blood gases (e.g., PaO2, PaCO2, and pH) and mixed venous gases (e.g., PvO2, PvCO2) that realistically change.

D Hematocrit should be automatically calculated to reflect oxyhemoglobin saturation and administration of a variety of intravenous fluids, such as whole blood, packed red cells, colloids, and crystalloids.

E. A complete hemodynamic monitoring package that includes the capability to measure and monitor the following:

ABP, Left ventricular blood pressure, CVP, Right atrial pressure, Pulmonary artery pressure, Pulmonary artery occlusion (wedge) pressure, cardiac output.

6. The patient simulator should have a pulmonary system that automatically calculates alveolar and arterial gas partial pressures in response to ventilation, fraction of inspired oxygen, intrapulmonary shunt fraction, and metabolic gas exchange (For example, apnea orhypoventilation should automatically result in hypercarbia, hypoxemia, decreasing oxyhemoglobin saturation and tachycardia)

A. During spontaneous ventilation, the patient mannequin should breathe with a spontaneously controlled respiratory rate and tidal volume to maintain normocarbia and adequate oxygenation.

B. Positive pressure ventilation or return of spontaneous ventilation should automatically reverse apnea with the response appropriate to the rate and tidal volume or ventilation.

C. The Patient Simulator should automatically responds to the fraction of inspired oxygen present, such as with smoke inhalation or supplemental oxygen.
D. Should have pre-cut for Bilateral chest tube insertion for saving skin replacement. chest tube insertion with fluid output and automatic resolution of physiology .
7. The patient simulator should have a pharmacology system model with automatic calculation of pharmacokinetics and pharmacodynamics for all commonly used intravenous and inhaled medications, yielding appropriate changes in patient clinical signs and monitored parameters. All patient responses to drug administration should be automatic, dose dependent and follow an appropriate time course even in case of students errors.
8. Patient outcome should be solely based on patient physiology and the treatment administered (e.g., ventilation, oxygen therapy, drug therapy) and should not be influenced by subjective assessment of the operator thus providing objective evaluation of clinical performance and reducing risk of negative training transfer
9. Patient simulator should be equipped with a simulated monitor capable of displaying all of the following parameters: ECG, Invasive Blood Pressures (ABP, CVP, PAP, WedgePressure), Cardiac Output, SpO2, PR/HR, ETCO2, Body and Blood Temperature, NIBP
A. The simulated monitor should have configurable alarm limits with accompanying sounds for each parameter.
B. The frequency of the pulse tone should be synchronized with the cardiaccycle and the pitch should correlate with the SpO2 value.
10. The mannequin should have a realistic airway (mouth, oropharynx, larynx, esophagus, trachea, carina) resembling to that of an actual human patient.
A. Depending on head positioning, choice of clinical tools, and other maneuvers, it should be possible to achieve anywhere from a Cormack Class I (e.g., easy intubation) to a Cormack Class IV (e.g., difficult intubation) airway.
B. The mannequin airway should allow use of airway adjuncts (e.g., combitube, laryngeal mask airway) as they are used in real patients, without any special adjustments by the instructor (e.g., activation of posterior swelling to seat the LMA).
C. The success or failure of airway management should be automatically reflected in the resulting ventilation, oxyhemoglobin saturation,and overall cardiopulmonary stability.
11. The patient simulator should have trauma simulation capabilities, such as:
A. Surgical cricothyroidotomy
B. Articulated mandible
C. Articulation in elbow, wrist, knees and elbows
D. Simultaneous bleeding at different sites linked to physiology
E. Secretions from eyes, ears, mouth.
F. Bi-lateral pneumothorax needle decompression at the clinically appropriate location
G. Bi-lateral chest tube insertion (with fluid return) at the clinically correct location.
Each trauma capability should require minimal instructor input and physiological consequences (e.g., improvement in blood pressure, ventilation, and oxyhemoglobin saturation) should be automatic.
12. The patient simulator should have fully independent left and right lungs.
A. One-sided pneumothorax should result in chest distention on one side, with the other side rising and falling with spontaneous breathing.
B. The simulator should have independent breath sounds linked to ventilation of each lung for both spontaneous and mechanical ventilation.
C. One-lung ventilation should automatically result in appropriate breath sounds, chest excursion, and pulmonary gas exchange.
D. Independent bilateral trauma feature (needle decompression / chest tube)
13. The patient simulator should have independent blinking eyes and reactive pupils. Eye blinking should be automatic and dependent on the underlying patient physiology (i.e., level-of- consciousness, level of neuromuscular blockade). It should be possible to easily set the pupils to different settings (i.e., pinpoint, reactive, non reactive, blown).
14. The patient simulator should be capable of physically shaking, giving a visible clue of convulsions, tremors, or other similar conditions.
15. The patient simulator should have touch activated, bi-lateral palpable pulses in the following locations: Carotid, Brachial, Radial, Femoral, Popliteal, Pedal (dorsalis and tibialis)
16. The patient simulator should have an advanced cardiac life support system in which:
A. Effective chest compressions automatically yield artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses, and exhaled CO2.
B. Ineffective chest compressions yield inadequate cardiac output and circulation and an absence of exhaled CO2.
C. Defibrillation energy is automatically identified, quantified, and logged
D. Pacing current is automatically identified, quantified, and logged, with appropriate physiological response.
17. The patient simulator should include independent simulations of patients (e.g., young healthymale, pregnant female, elderly patient with coronary artery disease) and injury/disease scenarios (e.g., anaphylactic shock, ruptured spleen, subdural hematonia.)
A. It should be possible to combine any patient with any scenario, creating a wide variety of clinical care simulations.
B. It should be possible to run multiple conditions simultaneously to create multi-trauma care simulations.

C. It should be possible to run multiple injury/disease scenarios simultaneously on a particular patient to create multitrauma simulations

18. Simulator must have the following in build Learning Module Scenarios:

A. Advanced Cardiac Life Support (ACLS) as per 2020 Guidelines

B. Airway Management –I

19. Web-based Digital Video & Audio Management System for Recording, Debriefing Assessment and Evaluation

 Web based digital video and audio management system for integration and synchronization of simulation exercise including physiological data logs, event logs, pharmacology data logs and patient monitoring data from multi simulators providing complete record for debriefing assessment and evaluation.

 System Software with following specification: Should have all in one web -based software application that includes all center management features on one platform without requiring user licenses, site licenses or add-on software modules.

Software should include

a) Recording

b) Review

c) Reports

d) Case Manager

e) Activities

f) Calender

g) Schedules

h) Resource Manager

i) User Manager

j) System Manager

k) Lightweight directory access protocol LDAP integration

Streaming

a) Should be able to live broadcasts with industry leading latency (<1sec)

b) Should have facility to connect up to 4 concurrently displays and synchronized, camera streams, plus 1 simulator in each room

c) Should be able to show Live stream videos to any number of remote sites

d) Widescreen HD video broadcast and recording, full screen mode

e) On-screen PTZ controls: click on image to pan and tilt, drag image to zoom in and out; from multi or single room views

f) DVR-type functionality to pause, rewind, and forward; even during live recording

Record

a) Full camera control (pan/tilt/zoom) from both live(single room) and a center overview (all rooms)available inbrowser from any client workstation

b) Pause live or recorded view and continue where you stopped (“time shifted live view”)

c) Manually start / stop recording or set recording to occur, based on a schedule or on user actions d) Save and restore custom layouts of the simulation/exam room views including size and positioning of individual video streams per room

Review

a) Immediate access to recorded data in order to review complex recordings of all camera, simulator, and peripheral device feeds assigned to the room

b) Access and control all recorded videos on one page (debriefing, deleting, downloading, renamingor reassigning videos)

Assess

a) Intuitive interface for creating custom checklists / rubrics for Learners, Faculty or SPs

b) Faculty / Staff can complete user-customized assessment rubrics, while watching live or recorded video

c) “What you see is what you get” content editor for the easiest, most streamlined, checklist-buildingprocess ever

d) Learners can interact with a variety of the data entry (i.e. SOAP Note, Step II CS write-up, handoff note, etc.)

e) Case evaluation, as well as, self and peer evaluations

f) Control Learner data entry with timer Faculty / Staff can grade any write up or short answer question, submitted by Learners

g) Standardized Patients can complete checklists, assessing the Learners, as well as each other Search, preview, and have the ability to reuse all questions

Report

a) Generate and export custom reports, covering both the group and individual performance, or use one of the many predefined report options

b) Give Learners access to their reports at home or on campus

c) Export data from system to work with outside of system (excellent system for researchers)

d) Review Faculty and Standardized Patient performance reports for quality assurance and consistency

e) Follow Learner progress in key skill areas, throughout their career, within your program

Activities

a) All activity cases, event dates, times, and rooms atone glance
b) Define participant groups (Learners, Faculty, SPs) with a quick link to add new group
c) Link Activities to Calendar events, for a first glance overview on the daily / weekly / monthly program
d) Allow Faculty to submit booking requests for specific room / resources within the simulation
center, to be managed by center administration
e) Assign resources, activities and participants to onetime or recurring calendar events

Manage

User management tools; with the ability to define roles, access privileges, and group memberships b) Batch upload large groups of users at once
c) Email notifications for Learners and SP's to choose preferred sessions, in times that areindicated / available for assessments
d) Advanced scheduling capabilities, to automatically adjust station schedules and extend rotations, asp and learner availability changes
e) Pre-scheduled recording, start / stop times, and intercom announcements, to coordinate with a pre- defined exam schedule, for a fully automated recording system

Track

a) Track the use of simulation center resources (rooms, simulators, personnel, etc.) by client
b) Generate reports quarterly / by semester / yearly
c) Generate and export utilization and allocation reports (tools to justify expansion, funding, etc.)

Integrate

a) Connect with any patient simulator to capture 360ºlive simulation data
Connect any simulated or real patient monitor for capturing and broadcasting HD screen image
b) Optical character recognition, to turn the video signal from monitor into real-time data streams, for visual trend charts and searchable physiological data
c) Use predefined layouts or define your own, for identifying key captured values on the connected screen
d) Remote site configurations

Access / Security

a) LDAP is a standard feature without requiring a module site license
b) LDAP authentication through your active directory, automated way of importing or updating user accounts from an LDAP directory service LDAP for SSO (Single Sign-On) remove the requirement to maintain multiple passwords for users.
c) Authenticate users in system against an LDAP directory
d) Shibboleth for SSO (Single Sign-On): authenticate users against a Shibboleth service, to provide single sign-on capabilities, without the requirement for multiple passwords
e) View any configured rooms with signed SSL certificates for secured connection

Technical specification

Should offers a 1:1 ratio between recording areas, simulator and recording appliances with the following built-in components:
a) Should be able to simulate record up to 3 video sources (2 cameras + 1 monitor)
b) Should be supplied with 2 cameras
c) Should have Input of 1 VGA, DVI or HDMI video source
d) Should have WiFi connection to simulators
e) Should have Input for institution network cable
f) Should have Built-in digital audio kit
g) Should have Input for a secondary microphone
h) Should have Built-in speaker to broadcast in-room intercom announcements
i) Should have 1,000 hours of HD video recordings
j) Should have Pre-configured with briefing and debriefing software
k) System should be supplied with a latest configuration laptop with three digital PTZ cameras
l) System should be supplied with 32" HD LED Display
20. The system shall be supplied with Stethoscope, Laryngoscope, LMA, Patient bed with IV stand, Resuscitation cart, Resuscitator Bag.
21. Compatible Ventilator for Simulated Scenario
• Should display complete range of basic monitored values
• Should have operator-adjustable parameters for each mode of ventilation common to conventional hospital ventilators
• Should have adjustable screen layout, alarms, and other settings
• Should provide experiential learning skills required to manage and monitor ventilation of a patient, and troubleshoot ventilator issues.
• Should have at least 17 alarms.
• Should have loops for pressure volume, pressure flow and volume flow.
• Should display waveforms for pressure, flow, volume, electrical activity of diaphragm, SpO2 and CO2.
• Should have maneuvers for inspiratory hold and expiratory hold

Should have following ventilation modes with parameters
• Volume-controlled ventilation (VCV): VT, PEEP, Flow Trigger, RR, Tpause, Ti rise, I:E, FiO2
• Pressure-controlled ventilation (PCV): Pi, PEEP, ΔPsupp, Flow Trigger, RR, Ti rise, I:E, FiO2
• Continuous positive airway pressure (CPAP+PSV): PEEP, ΔPsupp, Flow Trigger, Ti rise, End Inspiration %, FiO2, Tapnea, Pi backup, RR backup, I:E backup
• Volume support ventilation (VSV): PEEP, Flow Trigger, VT, Ti rise, End Inspiration %, FiO2, Tapnea, VT backup, RR backup, I:E backup
• Neurally adjusted ventilatory assist (NAVA): PEEP, Edi Trigger, Flow Trigger, NAVA Level, FiO2, Tapnea, Pi backup, RR backup, I:E backup
• Synchronized intermittent-mandatory ventilation (SIMV): PEEP, ΔPsupp, Flow Trigger, VT, RR, Tpause, Ti rise, I:E, End Inspiration %, FiO2
Should be supplied with :
• Ventilator cart
• Medical attachments for breathing circuit with mask and tracheal tube, SpO2 probe, CO2 sample line, O2 hose.
• Tablet for students
• All-in-one monitor
• ventilator software and license
• User guide
• Instructor Tablet & Router
• Physiological Software and license for standalone configuration.
22. Specifications for compatible Defibrillator for simulated scenario
• Should have complete range monitored values common to clinical defibrillators and AEDs (HR, SpO2, RR, ABP and more)
• Should simulates electrical therapy (defibrillation, cardio version, pacing), with realistic responses
• Should have adjustable alarms and other settings.
• Should Provides experiential learning skills required to deliver electrical therapy, configure a defibrillator or manage defibrillation of a patient like responding to alarms, adjusting layout based on patient mode and/or operator preference.
• Should have pads for 12 lead ECG I, II, III, aVR, aVL, aVf, V1, V2, V3, V4, V5, V6.
• Should include simulated scenarios for resuscitation trainings.
• Should display CO2, ABG, Spo2.
Should be Supplied with Standard Equipment
• Defibrillator carry bag
• Therapy pads
• 3-lead ECG cables
• 12- lead ECG cables
• Tablet
• Software for monitor defibrillator and AED and license
• User guide
• Instructor Tablet & Router
• Physiological Software and license for standalone configuration
Stand Alone Anesthesia Simulated Machine
 Should have wide range of patient conditions and standard setting available on most anesthesia machines existing market
 Should operate in conjunction with simulator or stand alone
Key Features
• Should have all full range of all monitored values common to anesthesia machines
• Should simulate delivery of multiple anesthetic agents, with realistic responses
• Should simulate interaction of all anesthesia machine controls, including: APL valve, manual ventilation switch, rebreather bag (inspiration), N2O (expiration), Iso (inspiration/expiration), Sev (inspiration/ expiration), gas flow dials (O2, N2O, AIR)
• Should have adjustable screen layout, alarms and other settings
• Should have an 36 Alarms, 4 Gauges, 3 Loops, 51 Numerics, 3 Views, 5 Waveforms
• Should have at least full range of operator-adjustable parameters for each ventilation mode
Should have following ventilation modes
• Volume-controlled ventilation (VCV): PEEP, Flow Trigger,VT, RR, Tpause, Ti rise, I:E
• Pressure-controlled ventilation (PCV): PEEP, Pi, ΔPsupp,Flow Trigger, RR, Ti rise, I:E
• Continuous positive airway pressure (CPAP+PSV):PEEP, ΔPsupp, Flow Trigger, Ti rise, Tapnea, Pi backup,RR backup, I:E backup
• Synchronized intermittent-mandatory ventilation (SIMV):PEEP, ΔPsupp, Flow Trigger, VT, RR, Tpause, Ti rise, I:E
Should have be supplied with
* Anesthesia cart
• Medical attachments (breathing circuit with mask and tracheal tube, SpO2 probe,CO2 sample line, O2 hose, N2O hose,

medical air hose, 3-lead ECG cables, IBP catheter, NIBP cuff, temperature probe)
• 2 monitors
• SimEquip Anesthesia software and license
• User guide
• Instructor Standalone Kit router, instructor tablet, physiology software and license required for standalone configuration
Simulated Anesthetic Agents
• Isoflurane
• Sevoflurane
• Desflurane
Should have following optional control
• O2 flush valve
• ACGO valve
• View soda lime canister control
• Leak, breathing-circuit disconnection
The following task trainers to be provided along with the above package
Spinal Epidural, lumbar Puncture and Thoracic Epidural Training Model
• Model for training for lumbar puncture, lumbar epidural and thoracic epidural procedures.
• Should be excellent for blind insertion techniques or using ultrasound for guided lumbar punctured spinal epidural procedures
• Needle access as well as the placement of catheters should be possible.
• Ability to position in the upright or lateral decubitus position allowing users to accurately position the model for appropriate training scenarios
• External landmarks as the iliac crests should be there in the model to initially orient the user to the proper access points
• Palpation of the spinous processes should be possible.
• The accessory obese spinal insert should provide more adipose tissue disallowing the palpation of the spinal processes
• Should be able to utilize for full procedural training including injecting local anaesthetics, intriduce the needle to the epidural space and/or subarachnoid space, thread catheters, infuse simulated anaesthetics, and obtain manometer measurements
• Ultrasound can be used for identification of the optimal insertion points, angle of needle insertion, determination of the depth to the ligamentum flavumepidural space and spinal cistern
• Should have ultra durable self-healing tissue realistic in ultrasound imaging characteristics and feels like real human tissue
• Replacement part should besupplied for atleast 1000 procedures
Ultrasound central line training model
• Model should have ultra-durable tissue should be realistic in ultrasound imaging characteristics, feels and cannulates like real human tissue
• Should be realisticcentral venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated with ultrasound guided central venous access procedures
• Should have ultra-durable self-healing tissue, extremely realistic in ultrasound imaging characteristics and feels like real human tissue
• Should contain anatomically correct vascular anatomy of the right upper thorax and neck including internal jugular vein, brachiocephalic vein, subclavian vein, axillary vein, carotid artery, subsclavian artery, and axillary artery as well as anatomical landmarks including the trachea clavicle the two head of the sternocleidomastoid muscle manubrium and the sterna notch
• Positive fluid flowin the vessels should provide users with immediate feedback when vessels are accessed
• Simulated blood fluids in the arterial vessels should differ from the venous system allowing for user to easily verify successful venous access procedures
• Tissues shouldmatch ch the acoustic characteristics of real human tissue.
• Arterial pulsation are simulated using a provided integrated automated pumping system
• Replacement part should be supplied for at least 1000 procedures. Peripherally inserted central catheters (PICC) with Intravenous and Arterial Line Vascular Access Ultrasound Training model.
• Realistic and ultradurable central venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated withultrasound guided vascular access procedures
• Ultra-durable self-healing tissue realistic in ultrasound imaging characteristics andfeels and fel and cannulates like real human tissue
• Contains the brachial and basilic veins, brachial artery, radial artery, ulnar arterymedial cubital v , and the cephalic vein
• Superb ultrasound imaging characteristics
• Positive fluid flowin the vessels to provide users with immediate feedback whenvessels are access
• Easy to refill simulated vessels
• Tissues match theacoustic characteristics of real human tissue

• Replacement part should be supplied for atleast 1000 procedures.

Femoral Vascular Access Lower Torso Ultrasound Model with DVT Option

• Realistic and ultra durable femoral vascular access ultrasound training model excellent for radiologists in the psychomotor skills associated with ultrasound guided procedure

• Superb ultrasound imaging characteristics

• Ultra-durable self healing tissues which should be realistic in ultrasound imaging characteristics and feels like real human tissue

• Anatomically correct vascular anatomy of the right lower torso including the femoral artery and vein should be provided.

• Anatomical landmarks of the lower torso should be there

• Ability to use traditional anatomical landmarks for blind insertion techniques, or ability to use ultrasound to obtain images of anatomical structures

• Should allow full threading of guidewires and catheters

• Venous and arterialfluids that are removed during central catheter insertions training should be easily refilled using quick fill ports

• Arterial pulsations system should be simulated using an integrated automated pumping system

• Positive fluid flow in the vessels should be there.

• Simulated blood fluids in the arterial vessels should be different from the venous system.

• Tissues should match the acoustic characteristics of real human tissue.

• Deep Vein Thrombosis (DVT) option should be provided.

• Replacement part should be supplied for at least 1000 procedures.

ADDITIONAL TERMS & CONDITIONS

 Single vendor should quote all the above systems of one manufacturer.

 Bidder will be responsible for integration of centralized classroom management system with simulators.

 The bidder must have experience in installing at least 3 simulation centers in the country at Govt Institute/Medical College and purchase order copy should be attached.

 Bidder has to provide a training program with a faculty trained on simulation initially for at least 5 working days at Hospital during installation. (The faculty shall be responsible for training the trainer).Bidder have to train the faculty thrice during the warranty period as per requirement.

 The simulators should be in functional (95% up-working time).In any case if any repair is needed it should be attend within 48 hours or Hospital will penalize as per the tender clause.

 Warranty: 5 years (with spares)

 A necessary three visit per year of company engineer is mandatory in warranty period apart from repair call for calibration.

The visit has to be registered in institute Log book, verified by Central store in-charge.

 Firm must quote cost of CMC for further 5 years .Bidder will be responsible to inform the institute at least 6months earlier for CMC

 Any software up-gradation on any of simulators has be to done free of cost during the warranty period

 An undertaking has to be given by supplier that the quoted simulator is of latest technology.

 Bidder should be Indian agent of the manufacturers for last 03 years and should submit order copy executed by the bidder for the quoted manufacturer/ principal in last three years.

1: Specification of Heart Lung Machine

1. Description of function

1.1 Heart Lung Machine is an apparatus through which blood is temporarily diverted, during heart surgery, to oxygenate it and pump it throughout the body, thus maintaining circulation until the heart and lungs are able to return to normal functioning

2. Operational requirements

2.1 BASIC EQUIPMENT will consist of the following unit

1) 5- Pump Console
2) Temperature Control Module (Hypo-Hyper thermia unit)
3) Monitors:
   a) Pressure monitor – arterial and cardioplegia with transducers
   b) Time – at least three timers
   c) Temperature Monitor with at least two probes
   d) Display of total volume of each infusion along with delivery time
4) a). Air- Oxygen Blender with hoses and Flow meter
   b). CO2 Blender Optional
5) Safety Devices –
   a) Level Sensor
   b) Ultrasonic air sensor (optional)

2.2 ACCESSORIES will include

1. Stainless steel line clamps
2. Stainless steel intra cardiac suckers
3. Remote Control module for Temperature Control Monitor Instrument tray with mounting arm S.N. Technical Specifications

3.1 5- Pump Console

1. The unit should have 5-pump console compactly arranged with separate power supply and control modules. Should have easy access connectors for interchanging the pump.
2. Each individual roller pump should be capable of running independently on 180-270 V/50- 60 Hz or DC supply.
3. Should have a spill proof base.
4. The unit should be supplied with a Battery backup for at least two pumps, all safety systems and accessories for a minimum of 60 minutes. Switch over from main power to battery backup should be automatic and immediate. The battery unit should be built in to the pump base and it should be recharged automatically when the system is operating with main power supply.
5. Individual pump heads should have Harvey Roller / **Horse shoe shape design** pumps with facility for tubing to be used adjustable and easily changeable mechanism.
6. Individual pump heads should have display in digital –The total infusion volume in litres and delivery time, the flow rates in LPM and in RPM
7. Each Pump should have easy mechanism for occlusion setting for different thickness of tubes available in the market
8. Should have unidirectional / **Bidirecional** hand crank facility as a critical safety feature hand crank loading should be from top for faster access.
9. The Console should have a compact base mount for the entire pump heads together, with pole and handles.
10. Should have variable, changeable tubing holders in each pump head
11. Should have movable oxygenator holder.
12. Roller pump should have a self diagnostic circuit with provision to detect and display critical alarm conditions. Optional Pulsatile module which can be mounted on any of the blood pump.

3.2 Should have a venous control module with single pole mast with electronic venous line occluder.

3.3 Should have a monitor mount with adjustable monitoring arm

3.4 Instrument tray positionable with long monitoring arm

3.5 Lightweight surface table; writing surface

3.6 **TEMPERATURE CONTROL MODULE (Heater Cooler Unit):**

Temperature control and Monitor system with Cardioplegia supply and remote Temperature display with the following features:

1. Simultaneous delivery of water for arterial and cardioplegia heat exchangers and to thermal blankets to be available from suitable ports.
2. To work with power supply of 220± 20 V 50 Hz.
3. Pressure regulated blanket ports maintaining the temperature of the arterial port.
4. Temperature display range of **0°-2° to 41°- 50°** Celsius; remote accuracy of 0.3 ° Celsius and remote temperature display unit module with 3-temperature display.
5. Microprocessor based unit to control, cool, re-warm and maintain temperature.
6. Water outlet temperature of heat exchanger and blanket range **0^{o} – 2^{o} C to 41° -42° C.**
7. Maximum flow performance of oxygenator heat exchanger supply port 15 – 22 LPM for fast cooling; 480mmHg maximum pressure.
8. Built in lce Maker to provide 50 lbs of ice in about 8 hours from 25º C water **or ice water 2° C.**
9. Should be capable of providing **0°-2° C** ice water for cardioplegia independently with variable cooling rate
10. Rewarming facility with venous difference mode settable at 6 to 10 ° C gradients to hold the water bath temperature at higher than the venous blood temperature.
11. Temperature probe module for the operating ranges of 0-50° C.
12. Temperature probes to fit in standard oxygenators (bubble / membrane)
13. Optional remote control unit should be capable of taking 9 Temp. Probes and display temperature in digital readouts. Alarm limits setting for at least three probes at crucial sites.
14. Product should be US-FDA / European CE approved.

3.7 **MONITORS:**

PRESSURE MONITOR: Facility to monitor one arterial line pressure and one cardioplegia line pressures (total 2); along with necessary pressure transducers, cables six (2 x 3 = 6) and domes reusable, with accurate digital display and alarm facilities audio and visual.

TIME MONITOR: Facility for 4 time displays -- 2 for arterial and 2 for cardioplegia delivery. With stop, reset and start function.

TEMPERATURE: 6 temperature displays for patient monitoring and for cardioplegia monitoring with digital display in Celsius with 6 necessary compatible temperature 6 probes and 6 additional probes (6x2=12 probes) with 3x2 = 6 of them for nasal, rectal and oesophageal use

3.8 **AIR- OXYGEN BLENDER:**

To work at 50-60 PSI for membrane oxygenator with water trap attached with necessary hoses and connections of minimum of 5 meters length and with triple flow glass flow meters.

3.9 SAFETY DEVICES: Safety monitor should have optional capability for computer interface to retrieve perfusion data

ULTRASONIC AIR SENSOR: Ultra sonic air sensor to detect bubbles to work equally well with crystalloid and blood; should be possible to fit anywhere in the circuit easily.

LEVEL SENSOR SYSTEM: Ultrasonic transducers to work well with crystalloid and blood with adhesive pads, with alarm settings.

3.10 **ACCESSORIES:**

1. STAINLESS STEEL LINE CLAMPS for cardio pulmonary bypass 12 Nos.
2. REMOTE CONTROL MODULE FOR THE TEMPERATURE CONTROL MONITOR
   Optional remote control unit should be capable of taking 9 Temp. Probes and display temperature in digital readouts. Alarm limits setting for at least three probes at crucial sites.
3. INSTRUMENT TRAY WITH MOUNTING ARM
4. AT LEAST TWO THERMAL BLANKET.
5. ON LINE MEASUREMENT OF PH, PCO2*& HB FOR NEONATAL CARDIAC SURGERY **(Optional)**

4. System Configuration Accessories, spares and consumables

4.1 12 Stainless steel line clamps

4.2 Remote Control module for Temperature Control Monitor

4.3 Instrument tray with mounting arm

4.4 Machine cover

4.5 System should be provided with appropriate furniture like adjustable revolving chair for the perfusionist to operate the system. The system should contain all the above accessories in Integrated or as separate accessories.

5. Environmental factors

5.1 The unit shall be capable of operating continuously in ambient temperature of 10 -40^0 C and relative humidity of 15-90%

5.2 The unit shall be capable of being stored continuously in ambient temperature of 0 -50^0 C and relative humidity of 15-90%

5.3 Shall meet IEC-60601-1-2:2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility.

6. Power supply

6.1 Power input to be 180-270VAC, 50-60 Hz,/440 V 3 Phase as appropriate fitted with special imported plug dedicated to the unit.

6.2 Resettable over current breaker shall be fitted for protection

6.3 Suitable UPS of with voltage regulation and spike protection for 60 minutes back up.

7. Standards, safety and training

7.1 Should be US-FDA or European CE approved product (Copy has to be enclosed)

7.2 Electrical safety conforms to standards for electrical safety IEC-60601 / IS-13450

7.3 One engineer should be posted for a week to impart training

7.4 Manufacturer should have ISO certification for quality standards.

8. Documentation

8.1 User manual in English

8.2 Service manual in English

8.3 List of important spare parts and accessories with their part number and costing available in stock with the supplier.

8.4 Certificate of calibration and inspection from factory.

8.5 Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out

8.6 List of Equipments available for providing calibration and routine Preventive Maintenance Support as per manufacturer documentation in service/technical manual.

2: Specification of Cell Saver

1. Description of Function

1.1 The Cell Saver system reprocesses blood for the patient and separates it into blood cells and plasma. Used in Surgical procedures in which there is rapid bleeding or high volume blood loss. It can also separate and remove clotting agents for the plasma. In this manner, blood may be prepared for long term storage or may be re-infused back into the patient during surgery. This reduces the need for blood from donors.

2. Operational Requirements

2.1 Manual & Automatic operation

2.2 Compact, portable design

3. Technical Specifications

3 . 1 Spinning centrifuge

3.2 Built-in programming

3.3 Built-in safety features

3.4 Sound volume control

3.5 Automatic protocols

3.6 Set up guide

3.7 The equipment should have inbuilt and regulated vacuum pump to suck the blood.

3.8 Centrifuge speed should be adjustable from 0 to 10000 RPM with variable speed wash. The pump flow 25 to 1000 ml. per minute.

3.9 System should have smaller foot print with big lockable castor wheel and weight should be less then 35Kgs.(inclusive of accessories and cart) for ease of mobility.

3.10 System should be fully automated with single button operation with self start capability and absolutely minimal user intervention.

3.11 Centrifugal bowl capacity should be 125-150ml with two stage filling cycle.

3.12 System should be approved by US FDA for autologous blood transfusion.
3.13 The company should quote a price for buy back of the existing machine (one) on an "as is where is" basis including the physical shifting of the machine.
3.14 It should have display to show all information during the operation as pump speed, centrifuge speed and alert messages.
3.15 The equipment should be able to separate lost blood, anti coagulant, filter store concentrate and wash.
3.16 Beside the RMC separation and washing it should able to sequester plasma and platelet from salvaged blood in separate bags

4.System Specification, Accessories, spares and consumables

4.1 Electrical specification:
Class I type B, ordinary Continuous operation.
4.2 Power :
Voltage – 220/240V or 110/120
Cycles – 50-60 Hz.
Phase – Single.
4.3 Speed and Flow rate specification :
Centrifuge – 0-10000 rpm.
Pump – 0-600 ml/min (+/- 5%)
Vacuum – 200-280 mbar.
4.4 Temperature Limit :
Operational : 10-40^0
Storage : 5-30^0.
4.5 Humidity range :
Operational : 10-95% non-condensing.
Storage : 10-95% non- condensing.

4.6 30 disposables should be provided with equipment
4.7 All consumables required for installation and standardization of system to be given free of cost.

5. Environmental factors

5 .1 The unit shall be capable of being stored continuously in ambient temperature of 05 - 30^0 C and relative humidity of 10-95%
5 . 2 The unit shall be capable of operating continuously in ambient temperature of 05 – 40^0 C and relative humidity of 10-95%

6. Power Supply

6.1 Power input to be 180-270VAC, 50 Hz Fitted with Indian plug
6.2 Suitable UPS of rating with spike protection, voltage regulation and for 60 minutes back up.

7. Standards, Safety and Training

7.1 Should be USFDA and European CE approved product
7.2 Manufacturer/Supplier should have ISO Certification for quality standards.
7.3 Comprehensive training for lab staff and support services till familiarity with the system.

8 Documentation

8.1 User/Technical/maintenance manuals to be supplied in English
8 . 2 Certificate of calibration and inspection.
8.3 List of Equipments available for providing calibration and routine maintenance support as per manufacturer documentation in service/ technical manual.
8.4 List of important spare parts and accessories with their part number and costing.
8.5 Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out.

3: Specification of IABP (Intra Aortic Balloon Pump)

IABP (Intra Aortic Balloon Pump) - High End.

1 Description of Function

1.1 Intra-aortic balloon pump (IABP) is a mechanical device that is used to decrease myocardial oxygen demand while at the same time increasing cardiac output. By increasing cardiac output it also increases

coronary blood flow and therefore myocardial oxygen delivery.

2 Operational Requirements

2.1 Microprocessor / microcontroller based system. System should be complete with Display Control system and pneumatic drive unit.

3 Technical Specifications

3.1 Pneumatics:
Drive system: Stepper motor driven bellows
Drive gas- Helium (Available with disposable canister or refillable cylinder.
Pumping Volume: 0.5 cc-50 cc Counter pulsation rate: 40-200 pulsations per minute

3.2 In Automatic Mode: System should be capable of automatically selecting appropriate trigger i.e. ECG or Pressure and also accurately select the inflation and deflation points, in automatic mode. In automatic mode of operation user should be in control of the deflation point. In Automatic mode Advance software should automatically adapt the timings for various rhythms and rate variations, without any user intervention. In Automatic mode it should automatically identify Arrhythmias and adopt R wave deflation mode for better patient support, without any user intervention In Manual mode the system allows user control of most of the pump functions.

3.3 Should be able to trigger on 7 mm Hg of Pulse pressure when used in Pressure Trigger mode

3.4 Single key start-up to make it fast, user friendly and easy to use

3.5 Should be able to display at least 3 wave forms as ECG, Invasive Pressure and Balloon Pressure wave forms

3.6 Large display for brighter and very good visibility from a distance in lighting conditions

3.7 On screen indication for Helium level in the cylinder and battery level for timely intervention and correction.

3.8 ECG inflation marker to indicate inflation period on ECG which can be useful when arterial pressure form is not available.

3.9 On screen indication of standby time and should give alarm after 15-30 minutes, to draw user's attention on the system being on standby

3.10 Optical Blood leak detect for early indication of blood coming into the balloon lumen due to IABC leak

3.11 Should have extensive Help Text available during start-up to make the system easy to use even for new users.

3.12 Should give extensive Help messages to correct the alarm conditions that are specific to the alarm condition. This should help the user to overcome the alarm problems immediately and with ease.

3.13 Should be capable of removing condensation automatically without user intervention and should be maintenance free.

3.14 Should have Peripheral Vascular Doppler for detecting limb ischemia, which is attached to the main equipment

3.15 Should have automatic Altitude correction to make it safer for the use during Air Transport

3.16 Should have software which allows the user to monitor the IABP from any remote location via a modem

3.17 In-built Comprehensive Service Diagnostics to help the technician to locate the fault immediately

3.18 Should have capability to connect on the Hospital network

3.19 Integrated Printer OR Chart recorder to print the reports.

4 System Configuration Accessories, spares and consumables

4.1 System as specified-

4.2 System should be supplied with the following:
ECG cable with Refillable Helium cylinder compatible with the IABP system Qty: 3 Nos.

4.3 Intra Aortic Balloon Catheter for Adults, Size: 40 cc Qty: 2 Nos.
Reusable Invasive Blood pressure transducer system with pressure flush device system. Qty: 2 Nos.

5 Environmental factors

5.1 Shall meet IEC-60601-1-2:2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. Or should comply with 89/366/EEC; EMC directive.

5.2 The unit shall be capable of being stored continuously in ambient temperature of 0 -50deg C and relative humidity

5.3 The unit shall be capable of operating continuously in ambient temperature of 10 -40 deg C and relative humidity of 15-90%

6 Power Supply

6.1 Power input to be 220 V AC, 50Hz fitted with Indian plug

6.2 On line UPS of suitable rating with voltage regulation and spike protection for 60 minutes back up.

7 Standards, Safety and Training

7.1 Should be US-FDA/ European CE approved product (Copy has to be enclosed)

7.2 Manufacturer/Supplier should have ISO certification for quality standards.

7.3 Must submit user list and performance report within last 3 years from major hospitals

8 Documentation

8.1 User/Technical/Maintenance manuals to be supplied in English.

8.2 Certificate of calibration and inspection.

8.3 Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out.

8.4 List of Equipments available for providing calibration and routine maintenance support as per manufacturer documentation in service / technical manual.

8.5 List of important spare parts and accessories with their part number and costing.

4: SPECIFICATIONS OF INVASIVE CARDIAC MONITORS

1**. Description of Function**

a. Capable of providing bedside monitoring of multiple parameters for adult, pediatric and neonatal patients.

2. Operational Requirements

a. Monitors should be IT ready for web based applications without requiring extra server, hardware and software

b. Monitor should be ready for networking (web based and wired) from the point of view of hardware and software.

c. Wired networking (cabling, connectivity and software) is required as standard supply and the networking includes bed to bed networking and bed to central station networking

d. Monitor should have a minimum of 72 hours of data storage, real time trend (graphical and tabular with intervals of 1, 2, 5, 10, 15, 30 minutes) and alarm logs

e. Monitor should have arrhythmia detection and arrhythmia logs

f. Customizable 6 or more screen layouts

g. Monitor should be ready for IABP interface

h. Monitor should be capable of integrating and communicating with clinical information management server and software without any up gradation.

i. One network color laser printer ready for print from any monitor

j. Module/hardware/software/cabling for the monitor to be used for dual/slave display of ventilation parameters, waveforms and loops of ICU ventilator Servo i

k. Ready to monitor following parameters

i. ECG

ii. Respiration

iii. SpO2 (conventional SpO_2 technology and Massimo Signal Extraction Technology both)

iv. Non-invasive blood pressure (NIBP)

v. Two invasive blood pressures (IBP) along with cardiac output module

vi. Core and skin temperatures

vii. End Tidal Carbon Dioxide ($EtCO_2$)

3. <u>Technical Specifications</u>

a. **Display specifications**

i. 17-21 inch or bigger color screen display

ii. Touch screen display with surface acoustic wave technology

iii. Rotary knob for navigation

iv. Rotary knob for navigation

v. 20 or more waveforms

vi. Wide visibility 150 degree or more

vii. Clear visibility from foot end of bed when monitor is placed at head end

viii. User selectable font size

ix. Ready for split screen display

x. Dust proof and without any fan

b. Specifications of essential parameters:

i. **ECG**

1. Should display 12 leads of ECG by connecting 6/5 ECG lead wires

2. Facility for display of 02 or more than 02 selected leads
3. Standard accessories as part of essential supply should include longest trunkcable and extension cable/flying lead.

ii. **Respiration**
1. Through both impedance method and capnography method
2. Standard accessories as part of essential supply

iii. **SpO2**
1. Should have the compatibility with conventional SpO_2 technology and Massimo Signal Extraction Technology (SET)
2. Standard accessories as part of essential supply for SpO_2 measurement by conventional as well as Massimo Signal Extraction Technology
3. Supply should include longest trunk cable and extension cable/flying leads for both conventional SpO2 technology and Massimo Signal Extraction Technology (SET)

iv. **Non-invasive blood pressure (NIBP)**
1. Oscillometric principle of measurement with stepwise deflation
2. Should have manual mode, stat mode or automatic mode
3. Automatic mode should have adjustable time intervals from 2-120 minutes or higher span
4. Standard accessories as part of essential supply (should include longest connecting cable and reusable antimicrobial coated cuffs - pediatric, small adult and medium adult).

v. **Invasive blood pressure (IBP)**
1. Ready for simultaneous monitoring of two invasive blood pressures as a standard configuration for central venous pressure and arterial blood pressure
2. Interface cable should be as per the user requirement depending upon the transducers currently in use
3. Standard accessories as part of essential supply should include longest trunk cable and extension cable

vi. **Temperature**
1. Simultaneous monitoring of core temperature and surface/skin temperature
2. Standard accessories as part of essential supply should include longest trunk cable and extension.

vii. **End Tidal Carbon Dioxide ($EtCO_2$)** through main stream sensor
- Standard accessories as part of essential supply should include longest trunk cable and extension

c. Central station
Including cabling for 15/16 monitors with display two TFT screens of 18" or more with key board and mouse

4. System Configuration, Accessories, Spares and Consumables
a. License for 15/16 or more patients for bed-to-bed and bed-to-central station networking
b. Presence and details of ports and connectors of monitor
i. RS232, USB, RJ45 and DVI
ii. Others
c. Details of ports and connectors of central station
i. RS232, USB, RJ45 and DVI
ii. Others

5. Environmental factors
a. Temperature
i. Operating temperature from 4 to 40 degree or higher span
ii. Storage temperature from -15 to +50 degree or higher span
b. Relative humidity (RH)
i. Operating RH from 10 to 90% or higher span
ii. Storage RH from 10 to 90% or higher span

6. Power Supply
a. Monitor should have computer memory to serve real time clock
b. Power input to be 220-240VAC, 50Hz. Power cable should be fitted with Indian plug and adapter.
c. Monitor should have backup battery for more than 15 minutes for processor and more than 5 minutes for display

7. Standards,Safety andTraining

a. Should have defibrillator and cautery protection
b. Conformity to standards for electrical safety
c. Conformity to standard drop test
d. Conformity to standard safety against water ingress
e. Onsite first 02 training sessions spreading over 06 months for about 50 nurses, 20 doctors and 05 technicians
f. Onsite 05 additional training sessions spreading over 05 years for about 50 nurses, 20 doctors and 05 technicians.
g. Product should be European CE / US- FDA approved.

8. Documentation

a. User manual (hard copy and soft copy) for monitor
b. User manual (hard copy and soft copy) for specific modules
c. User manual (hard copy and soft copy) for central station

9. Optional requirements with a condition that

(1) Monitor should be ready for future upgrades for the parameters mentioned below and
(2) Rates should be quoted in the financial bid with a condition that the rates would remain applicable for a period of 5 years or more.

a. Module for continuous beat to beat arterial pressure monitoring through non invasive technique with complete technical details including standard accessories as part of essential supply.
b. Module for upto 4 channel EEG with spectral display with complete technical details including standard accessories as part of essential supply.
c. Module for thermodilution cardiac output including cardiac output kit and 05 disposable catheters with complete technical details including standard accessories as part of essential supply.
d. Module for PICCO cardiac output including cardiac output kit and 05 disposable catheters with complete technical details including standard accessories as part of essential supply.
e. Module for additional two IBPs like intra-abdominal pressure, pulmonary artery pressure etc. with complete technical details including standard accessories as part of essential supply
f. Modules/pods/other hardware/software for any other parameter (other than mentioned above) that may be required in the future with complete technical details including standard accessories as part of essential supply
g. Monitor interface including hardware and software from the available list of compatible and networkable monitors of own makes and others makes.
h. Accessories
i. Multi lead/multi measurement/ECG trunk lead (all lengths)
ii. Flying lead for ECG (all lengths)
iii. NIBP connecting cable (all lengths)
iv. NIBP disposable cuff (infant)
v. NIBP disposable cuff (pediatric)
vi. NIBP disposable cuff (small adult)
vii. NIBP disposable cuff (medium adult)
viii. NIBP reusable antimicrobial coated cuff (infant)
ix. NIBP reusable antimicrobial coated cuff (pediatric)
x. NIBP reusable antimicrobial coated cuff (small adult)
xi. NIBP reusable antimicrobial coated cuff (medium adult)
xii. NIBP reusable antimicrobial coated cuff (large adult)
xiii. Skin/surface temperature probe (all lengths)
xiv. Core/esophageal temperature probe (all lengths)
xv. Conventional SpO_2 trunk leads (all lengths)
xvi. Conventional SpO2 sensor (infant)
xvii. Conventional SpO2 sensor (paediatric)
xviii. Conventional SpO2 sensor (adult)
xix. Massimo SET Patient Cable for SpO2 (all lengths)
xx. Masimo SET Patient Cable (all lengths) for Total Hemoglobin (SpHb), Pleth Variability Index(PVI).
xxi. Masimo SET SpO2 sensor (infant/paediatric)
xxii. Masimo SET SpO2 sensor (adult)
xxiii. Masimo SET sensor (adult) for Total Hemoglobin (SpHb)
xxiv. Masimo SET sensor (adult) for Pleth Variability Index (PVI)
xxv. Masimo SET sensor (adult) for Masimo SET measurements of Oxygen Saturation (SpO_2), Pulse Rate (PR), Perfusion Index (PI)
xxvi. End Tidal Carbon Dioxide ($EtCO_2$) sensor

xxvii. End Tidal Carbon Dioxide ($EtCO_2$) airway adaptor

Note :

Must submit user list and performance report within last 3 years from major hospitals

5: Specifications for ICU Ventilator- High End

The ventilator should be microprocessor based and work with hospital external high pressure line/ external compressor to be used in ICU for Adult, Paediatric and infant patients. It should be easy to use having a color inbuilt touch screen at least 12 inch or more in size with screen lock, intuitive menu structure, , Mode preset capability, Pressure bar graph/ breath indicator and prioritized alarms alongwith the following settings/ features :-

1. Ventilation Mode

Volume Controlled ventilation (Assisted / Control)	VCV
Pressure Controlled ventilation (Assisted / Control)	PCV
Synchronized intermittent mandatory Ventilation	V-SIMV AND P-SIMV
Pressure support ventilation (Spont, CPAP, PEEP)	PSV
Non invasive ventilation	VCV, PCV, SIMV, PSV
Volume assured pressure support	VAPS
Mandatory rate ventilation	MRV
Airway pressure release ventilation	APRV/BI-PHASIC VENTILATION
Pressure regulated volume control	PRVC
Continuous positive airway pressure	CPAP

2. Ventilation Settings & Ranges

Tidal Volume	20 ml to 2000 ml or more
Inspiratory Peak Flow	0 to 200 LPM (Compensated) [preferred]
Maximum Inspiratory Peak Flow	> 200 l/min (depending on gas supply pressure)
Respiratory Rate	upto 100 BPM
SIMV Respiratory Rate	1 to 60 BPM
Inspiratory plataeu	0 to 60 % of IT
FiO2	21% to 100%

Insp pause, Exp Pause, sustained exhalation, programmable sigh

Inspiratory Trigger (pressure and flow trigger)

Should have apnoea back up of atleast 20 seconds.

3. Monitored Parameters

Respiratory Phase & Type, Respiratory Rate, Exhaled Tidal Volume, Exhaled Min. Volume Total, I : E : Ratio, Peak Inspiratory Pressure, Average Pressure, Plateau Pressure , End Expiratory Pressure, % Oxygen Delivered, f/Vt (RSBI), etCo2(End tidal Co2)

4. Respiratory Mechanics Maneuvers

Static Compliance and Resistance ,

Low Inflation flow (LIP) and upper inflection point (UIP),

Some form of alveolar recruitment monitoring to be present to determine the right level of PEEP.

5. Displayed Trends Values for 72 hours atleast

6. Graphics Module with

Scalars

Flow vs. Time

Pressure vs. Time

Adjustable Time Scale.

Loops

Flow / Volume

Pressure / Volume

Facility for Freeze Screen

Individual Analysis of Each Curve

Loop Save and Overlay Function
Individual Analysis of Each Loop

Calculated Values
Inspiratory pause, Expiratory Pause

7. **Should have audio-visual alarms alongwith appropriate message for**
Inspiratory pressure (High), circuit, FiO2 (High/Low), Resp Rate, Tidal volume, minute ventilation,

8. The ventilator should have built-in programmable nebulizer
9. **AC Power & Battery Indicators**

- Loss of AC Power (visual)
- Charging, In Use, Low
- Main Battery in Use
- Should have at least one hour back-up

10. **Self Test / Self Diagnosis**
- Quick Self Test and Extended Self Test

11. **Interface Port**
RS - 232 Output and Remote Communication

12. Ventilator should be European CE and USFDA APPROVED

13. **Scope of supply**

Ventilator	– 1 No
Air supply unit	– 1 No (OPTIONAL)
Patient Tubing (adult)	– 2 Nos/unit
Patient Tubing (paed)	– 2 Nos/unit
Nebuliser Kit	- 50 Nos/ Ventilator
NIV Mask with harness (Reusable)	- 2 Nos in each category/ Ventilator
Humidifier (F&P 810) with chamber	- 1 No/ Ventilator
Bacteriological filters	- 10 Nos/ Ventilator
Reusable mask (adult and pediatric)	- 2 each

14. **OPTIONAL ITEM**
    1. **Air compressor(from the same manufacturer)**

DEMONSTRATION IS MUST AS AND WHEN REQUIRED.

6: Specification of ACT Machine

1. **Description of Function**
    1.1 Activated Clotting Time (ACT) is a measure of the anticoagulation effects of heparin. The main use of this diagnostic test is in cardiac catheterization labs and open heart and vascular surgery, where they need to keep track and have specific measures of clotting times.

2. **Operational Requirements**
    2.1 One button operation, easy to use
    2.2 Portable system

3. **Technical Specifications**
    3.1 ACT machine having at least two test well
    3.2 2 point clot detection facility to get accurate results (Optional).
    3.3 Parameters- ACT (Mandatory) APTT & PT (Optional).
    3.4 Shall use fresh blood at the bedside.
    3.5 Shall require less than 3 cc of blood per sample

3.6 Digital Display on Screen of any size.

4. System Configuration Accessories, spares and consumables

4.1 System as specified-

4.2 ACT Tubes - 200 nos

5. Environmental factors

5.1 Shall meet 1EC-60601-1-2:2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. Or should comply with 89/366/EEC; EMC directive.

5.2 The unit shall be capable of being stored continuously in ambient temperature of 0 -50° C and relative humidity of 15-90%

5.3 The unit shall be capable of operating in ambient temperature of 20-30° C and relative humidity of less than 70%

6. Power Supply

6.1 Should work on 180-270V AC as well as batteries. Mains adaptor to be supplied

7. Standards. Safety and Training

7.1 Should be US - FDA and European CE approved product

7.2 Manufacturer/Supplier should have ISO certification

8. Documentation

8.1 User/Technical/Maintenance manuals to be supplied in English.

8.2 Certificate of calibration and inspection.

8.3 Log book with instructions for daily, weekly. monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out.

8.4 Must submit user list and performance report within last 3 years from major hospitals

7: SPECIFICATION OF ETHYLENE OXIDE STERILIZER

1) Chamber - SS 316

2) Insulation of shell - 50 mm thk. R.B. fibre glass with aluminum foil.

3) Door - Single, SS 316, hinged type

4) Paneling - SS Box type design. PLC, temp. Controller, Compound gauge and switches will be located within the panel .

5) Mode of heating - Chamber will be heated with electric air heaters of 3 KW.

6) Vacuum pump - Diaphragm type vacuum pump provided to achieve high level of air removal for high sterility.

7) Gas Purging - **Two Cycle, One for** cartridge puncturing and another ETO gas Gas Cylinder System should be available in PLC.

8) Sterilization Process - One no. sterilization cycle with inbuilt leak test will be provided, which will be completed automatically.

9) Stand - SS.

10) Accessories - 1 no. wire basket for chamber
1 no. air compressor of 1HP.

11) Chamber Size - 10-12" X10-12" X 20- 24"

12) Aeration time - pulsing system by vacuum pump within 40-60 minutes.

13) Product should be **CE** Certified.

14) Company should have valid ISO (9001-2008 & 2003-13485) certificate.

15) Company should have manufacturing experience more than 10 years.

8: Specification of External Pacemakers

Single Chamber – External Pulse Generator

1. Must have Constant Current Driven Output from 0.1 mA to 20 mA
2. Must have Pacing continuation after battery removal for at least 30 seconds
3. Must be able to pacing in following Modes : DDD, DOO, DDI, AAI, AOO, VVI, VOO
4. Must have sensitivity Atrial 0.4 - 10 mV &Ventricle 0.8 - 20 mV
5. Must have basic pacing rate between 30 -200 ppm
6. Must have Atrial Overdrive pacing upto 800 ppm
7. Must have minimum Battery life of 7 Days.
8. Should be provided with pacing cables and other accessories.
9. Must have easy to find and replace AA Batteries.
10. Should have local service facility.
11. Must submit User list and Performance report in the last 3 years from major hospitals should be enclosed.
12. User Manual in English.
13. Service manual in English.
14. List of important spare parts and accessories with their part number and costing.
15. Must be European CE certified and US FDA approved.

9: Specification of External Pacemakers

Dual Chamber – External Pulse Generator

1. Must have Constant Current Driven Output from 0.1 mA to 20 mA
2. Must have Pacing continuation after battery removal for at least 30 seconds
3. Must be able to pacing in following Modes : DDD, DOO, DDI, AAI, AOO, VVI, VOO
4. Must have sensitivity Atrial 0.4 - 10 mV &Ventricle 0.8 - 20 mV
5. Must have basic pacing rate between 30 -200 ppm
6. Must have Atrial Overdrive pacing upto 800 ppm
7. Must have minimum Battery life of 7 Days.
8. Should be provided with pacing cables and other accessories.
9. Must have easy to find and replace AA Batteries.
10. Should have local service facility.
11. Must submit User list and Performance report in the last 3 years from major hospitals should be enclosed.
12. User Manual in English.
13. Service manual in English.
14. List of important spare parts and accessories with their part number and costing.
15. Must be European CE certified and US FDA approved.

10: SPECIFICATION OF SYRINGE INFUSION PUMPS

- Should have three kinds of modes: Rate Mode, Time Mode, and Body Weight Mode.
- Should have unique door free structure: Avoiding problem of pump stock and fluid leakage.
- Should have Double CPU: making the process of injection safer and more reliable.
- Should have accurate infusion: Precise control of the infusion rate & infusion volume.
- Should have Flow rate range: 1.0ml/h-2000ml/h.
- Should have driven & step motor: No pulsating wave will be reduced even during low rate infusion.
- Should have Alarm is given in the following situations: Infusion Completion, Occlusion, Low battery, Air bubble, Installation error when there is malfunction or operation error and the machine stops running automatically.
- Should have KVO rate can be selectable according to concrete requirements from 1.0ml/h to 5.0 ml/h.
- Should have Wireless Module Control: When used with SK data collector terminal, the infusion information will be transferred to the infusion supervision system in order to ensure the patients safety.

- Should have Displayed information: Rate, Vol Limit, Battery charge indicator, AC power indicator, Over, OCCL, Air, Bed no.
- Should have Infusion rate range: 1.0 – 2000ml/h.
- Should have Batter Accumulated injection volume 0.1ml-9999.9ml.
- Should have Infusion accuracy: +_ 3%

Equipment Specifications for Syringe Infusion Pump

1. Description of Function

1. Syringe Infusion Pump provides uniform flow of fluid by precisely driving the plunger of a syringe down its barrel. It provides accurate and continous flow rate for precise delivery of I.V. medication in critical medical care.

2. Operational Requirements:

2.1 The syringe pump should be programmable, user friendly, safe to use and should have battery backup and comprehensive alarm system. This should be able to integrate in the HIS

2.2 Demonstration of the equipment is essential.

3. Technical Specifications:

3.1 Flow rate programmable from 0.1 to 1000 ml/hr or more in steps of 0.1 ml/hr with user selectable flow set rate option. SAVE last infusion rate even when the AC power is switched OFF.

3.2 Bolus rate should be programmable to 40 – 500 ml/hr or more with infused volume display. Reminder audio after every 0.5 ml delivered bolus. SAVE last Bolus rate even when the AC power is switched OFF.

3.3 Display of Drug Name with a provision of memorizing 10~15 names by the operator

3.4 Keep Vein Open (KVO) must be available 1.0 ml/hr or set rate if lower than 1.0 ml. User should have choice to disable KVO whenever desired.

3.5 Selectable Occlusion pressure trigger levels selectable from 300/500/900 mmHg

3.6 Must Work on commonly available ISI/CE/FDA APPROAVED/CERTIFIED 20, 50/60 ml Syringes with accuracy of minimum of +/-2% or better.

3.7 Automatic detection of syringe size & proper fixing. Must provide alarm for wrong loading of syringe such as flanges out of slot; disengaged plunger, unsecured barrel etc.

3.8 Anti bolus system to reduce pressure on sudden release of occlusion

3.9 Should have comprehensive alarm package including:Occlusion limit exceed alarm ,Near end of infusion pre-alarm & alarm,Volume limit pre-alarm & alarm,KVO rate flow,Low battery pre-alarm and alarm,AC power failure, drive disengaged and preventive maintenance.

3.10 Rechargeable Battery having at least 5~6 hour backup for about 5ml/hr flow rate with 50ml syringes. Larger battery life and indication of residual life will be preferred.

4. **System Configuration Accessories, spares and consumables**

4.1 Syringe Infusion Pump -01

4.2 Mounting device/ Docking Station for two or four pumps as per requirement so as to enable to power up to 2-4 pumps with one power cord when mounted on IV pole. -01

5. **Environmental factors**

5.1 Shall meet IEC-60601-1-2 :2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility.

5.2 The unit shall be capable of operating continuously in ambient temperature of 10 -40deg C and relative humidity of 15-90%

5.3 The unit shall be capable of being stored continuously in ambient temperature of 0 -500 C and relative humidity of 15-90%

6. **Power Supply**

6.1 Power input to be 220-240VAC, 50Hz

7. **Standards, Safety and Training**

7.1 Should be US FDA or CE approved product

7.2 Electrical safety conforms to standards for electrical safety IEC-60601-1 General Requirements

7.3 Manufacturer should be ISO certfied for quality standards.

7.4 Certified for meting IEC60601-2-24:Particular requirements for the safety of infusion pumps and controllers

7.5 Should meet IEC 529 Level 3 (IP3X)(spraying water) for enclosure protection , water ingress.

7.6 Electrical Safety Classification Class I/II, Type CF and Internally powered equipment.

7.7 Certified for meeting IEC 60601-1-4 Medical electrical equipment - Part 1-4: General requirements for safety - Collateral Standard: Programmable electrical medical systems
7.8 Comprehensive warranty for 3 years and provision of CMC for next 7years.
7.9 Should have local service facility .The service provider should have the necessary equipments recommended by the manufacturer to carry out preventive maintenance test as per guidelines provided in the service/maintenance manual.
8. **Documentation**
8.1 Certificate of calibration and inspection from factory.
8.2 List of Equipment's available for providing calibration and routine maintenance support as per manufacturer documentation in service / technical manual.
8.3 User Manual in English
8.4 Service manual in English
8.5 Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist.The job description of the hospital technician and company service engineer should be clearly spelt out.
8.6 List of important spare parts and accessories with their part number and costing.
8.7 User list to be provided with performance certificate.
8.8 Performance report in the last 3 years from major hospitals should be enclosed.

11: SPECIFICATION OF SURGICAL LOUPE

MAGNIFYING SURGICAL LOUPE
Specifications:

1. Magnification Approx : 2.5 – 4.0 X.
2. Adjustable or customized as per your requirement.
3. Optics should have superior resolution, field size and image brightness.
4. Configurations : TTL; Flip-up.
5. Field width & depth : 8 – 15 cm.
6. Weight: 60-90 grams.
7. Working distance: Customized between 25-60cm.
8. Waterproof, Hypo allergenic, Corrosion resistant.
9. Unique adjustable nose pad.
10. Lightweight, Unparalleled in strength.
11. Carrying case with engraving doctor's name on the box & temple.
12. It should be European CE and US FDA approved.
13. Demonstration of the product is must.
14. Must submit User list and Performance report

12: Surgical Head with light

Specifications:
1. Light source unit should be 300watts xenon light technology having four standard cable port which can be used with other cables and head band
2. Light intensity should be between 390-920 lumens, which can deliver bright light.
3. The colour temperature should be between 5700kelvin to 5900kelvin, which ensure the light intensity near to daylight.
4. Unit should have stand by switch which can remember the last setting used, and should be having smart fan technology; Light intensity should vary from 20-100% in 5% increment.
5. Unit should be able to display lamp and system age meter.
6. For future expansion unit should be compatible with head light camera system.
7. Unit should be supplied along with original company mobile floor stand. The said stand should have a forward facing basket and/or hooks to sore the cable and headlight when not in use.
8. Head band should be of maximum comfort with cushions having occipital basket and cranial support and should have extended linkage
9. The light spot size should be adjusted between 20mm-180 mm at various distances.
10. Unit should be supplied along with premium fully fused fiber optic cable having a length of 9 feet (2.75meter), which should have higher temperature resistance (421 - 485*c) and ensure bright light transmission.
11. Cable diameter should be 3- 5 mm which ensure it is light weight, and outer sheet should be translucent which provide full visualization of fiber integrity.
12. All four items Light, stand, head band, and cable should be from one company brand

13. The light company should be US FDA or European CE approved, which determine the higher quality of product quality.

13: Specification of STERNAL SAW

Saggital Saw Hand piece:

1. Should have two speed controls with standard and fast mode. Free speed of 10000-12000 Cycle's per minute.
2. Saw Noise level should not more then 89db
3. Weight of hand piece with battery should be not more than 3-4 lbs
4. Blade mount should be adjustable to different angles with 360 degree rotation
5. Should have tool less mounting of accessories
6. The sternal saw is light weight and provide clear line of sight.
7. The sternal saw operates through a flexible drive cable by an electric motor.
8. It is able to be ETO Sterilized/autoclaved.
9. The blade holding mechanism is chuck type assembly for quickly replacing the blades.
10. The reciprocating blade has a 5mm stroke length.
11. The saw should have a blade protector on it and blade protector should be easily replaceable. Additional 10 blades of sterna saw should be provided.
12. Foot switch permits variable saw speeds with waterproof and anaesthetic agent proof..
13. The system operates on be 220V/250Hz. Single phase.
14. Should provide minimum1 Nos. of sterile micro oil 300 ml.
15. Overheating cut off of motor with reset facility.
16. Should be ETO/autoclavable
17. Should have safe mode.
18. Should be provide with Battery kit and Battery Charger and the sterilization case
19. Should be CE certified and US FDA approved.
20. Demonstration of the product is must.

Battery Charger:

1. 220-240 volts charger and should have the feature to count the charging cycle for a particular battery.
2. Should have capability to identify the worn out battery
3. Should have to charge four batteries at a time
4. Should have an indicator to provide battery status for charging.
5. Should be able to check over autoclaved battery cycles (Number of Time and Total time)
6. Should have reconditioning features for battery
7. Should be able to charge different batteries with same charger.
8. Should be CE certified and US FDA approved.
9. Demonstration of the product is must.

Battery Kit:

1. Ni Mh batteries with low internal impedance to deliver higher current than other battery Types.
2. Ni Mh cells with capacity to produce more torque and non autoclavable with life of 300 approximate charging cycles.
3. Should have a run time of minimum 21 minutes
4. Should include Autoclavable outer housing
5. Shield to protect battery from the housing
6. 180 degree opening of battery housing for easy insertion of battery
7. Should have option for autoclavable batteries.
8. Should be CE certified and US FDA approved.
9. Demonstration of the product is must.

Sterilization Case:

1. Should accommodate all hand piece, attachment and accessories for autoclave.
2. Demonstration of the product is must.

14: Specification of Redo STERNAL SAW

Saggital Saw (Redo) Hand piece:

1. Should have two speed controls with standard and fast mode.
2. Free speed of 10000-12000 Cycle's per minute.
3. Saw Noise level should not more then 89db
4. Weight of hand piece with battery should be not more than 3-4 lbs
5. Blade mount should be adjustable to different angles with 360 degree rotation
6. Should have tool less mounting of accessories
7. The sternal saw is light weight and provide clear line of sight.
8. The sternal saw operates through a flexible drive cable by an electric motor.
9. It is able to be ETO Sterilized/autoclaved.
10. The blade holding mechanism is chuck type assembly for quickly replacing the blades.
11. The reciprocating blade has a 5mm stroke length.
12. The saw should have a blade protector on it and blade protector should be easily replaceable. Additional 10 blades of sterna saw should be provided.
13. Foot switch permits variable saw speeds with waterproof and anaesthetic agent proof..
14. The system operates on be 220V/250Hz. Single phase.
15. Should provide minimum1 Nos. of sterile micro oil 300 ml.
16. Overheating cut off of motor with reset facility.
17. Should be ETO/autoclavable
18. Should have safe mode.
19. Should be provide with Battery kit and Battery Charger and the sterilization case
20. Should be CE certified and US FDA approved.
21. Demonstration of the product is must.

Battery Charger:

1. 220-240 volts charger and should have the feature to count the charging cycle for a particular battery.
2. Should have capability to identify the worn out battery
3. Should have to charge four batteries at a time
4. Should have an indicator to provide battery status for charging.
5. Should be able to check over autoclaved battery cycles (Number of Time and Total time)
6. Should have reconditioning features for battery
7. Should be able to charge different batteries with same charger.
8. Should be CE certified and US FDA approved.
9. Demonstration of the product is must.

Battery Kit:

1. Ni Mh batteries with low internal impedance to deliver higher current than other battery Types.
2. Ni Mh cells with capacity to produce more torque and non autoclavable with life of 300 approximate charging cycles.
3. Should have a run time of minimum 21 minutes
4. Should include Autoclavable outer housing
5. Shield to protect battery from the housing
6. 180 degree opening of battery housing for easy insertion of battery
7. Should have option for autoclavable batteries.
8. Should be CE certified and US FDA approved.
9. Demonstration of the product is must.

Sterilization Case:

1. Should accommodate all hand piece, attachment and accessories for autoclave.
2. Demonstration of the product is must.

15: Surgical Instrument Set

Sr No	MICS Instruments	Description	Shaft In mm	Working Length In cms	Jaw Size In mm
1	**Retractor with accessories**	**MIS Thoracic Double hinged retractor with 3 pairs of changeable blades along with a crossbar, Clamping Piece for atrial hook or LA retractor.**			
2	Valve Hook	Mitral valve hook straight/curved in small/medium/large size	5mm	15,20	95x22, 95x18, 65x18
3	Atrial Holding System	**LA Retractor holding system with 6 interchangeable blades of different size with a chest fixation platefor independent fixation.**			
4	Graspers / Forceps	**De bakey fine teeth Double Action Forcep with 1 x 2 Teeth**	5 mm	18/25/30	1.5 x 10 mm
		De bakey Single action forcep	5 mm	18/25/30	1.5 x 14 mm
		De bakey medium Double action forcep with 1 x 2 Teeth	5 mm	18/25/30	2.8 x 12 mm
		De bakey Large,Double action forcep with 1 x 2 Teeth	5 mm	18/25/30	3 x 14 mm
		De bakey Extra Large,Double action forcep with 3 x 2 Teeth	5 mm	18/25/30	5 x 28mm
		De bakey Extra Large,Double action forcep with lock & 3 x 2 Teeth	5 mm	18/25/30	5 x 28mm
		RESANO Double action Forcep	5 mm	18/25/30	14 mm
		RESANO Double action Forcep	5 mm	18/25/30	18 mm
		RESANO Single action Forcep	5 mm	18/25/30	14 mm
		GEMINI Double Action Diliating, Curved, Smooth Forcep	5 mm	18/25/30	30 mm
5	Rongeur for Valve.	Valve rongeur with Stright Tip	5 mm	18/25/30	3.5 mm
		Valve rongeur with 30 Degree Curved Tip	5 mm	18/25/30	3.5 mm
6	**Chitwood Aortic Cross Clamp**	**Debakey Chitwood transthoracic aortic clamp with 2x3 & 1x2 Teeth**		29 / 30 /36	60 / 90/ 120
7	Nerve & Vessel Hook	Nerve or Vessel Hook with Ball Point Tip		23	10
		Nerve or Vessel Hook with Fine Tip		23	6mm, 1 mm
		Nerve or Vessel Hook with Standard Tip		23	10mm, 2 mm
8	**Knot Pusher**	**Knot Pusher Angled 45 Degree.**	5 mm	18/25/30	14 mm
		Knot Pusher Straight Tip	5 mm	18/25/30	NA
9	Scalpel Holder	Long scalpel blade holder with total length of 30cm	5 mm	26 cm	
10	Suture Catcher	**Suture catcher handle**		24	2 mm
		Suture catcher system with safety system		17	2 mm
11	Scissors	Metzenbaum Straight Double Action Scissors	5mm	18/25/30	14 mm
		Metzenbaum curved 15 Degree scissors	5mm	18/25/30	14 mm
		Metzenbaum curved 30 Degree scissors	5mm	18/25/30	14 mm
		Metzenbaum curved 70 Degree scissors	5mm	18/25/30	14 mm
12	**Double Action Scissor**	**Metzenbaum Joint Scissors straight with double action for Highly Calcified Annulus & Valves.**	NA	32	40 mm
13	**Needle Holders**	TC Needle holder straight.	5 mm	18/25/30	3x 10 mm
		TC Needle holder straight.	5 mm	18/25/30	2 x 8 mm
		TC Needle holder straight.	5 mm	18/25/30	2 x 6 mm
		TC Needle holder straight.	5 mm	18/25/30	1 x 8 mm
		TC Needle holder straight.	5 mm	18/25/30	1 x 10

					mm
		TC Curved Left	5 mm	18/25/30	3 x 10 mm
		Mini Curved Left	3.5 mm	18/25/30	2 x 6 mm
		Mini Straight	3.5 mm	18/25/30	2 x 6 mm
		Crile Wood Curved	5 mm	18/25/30	2 x 8 mm
		TC Ryder Straight	5 mm	18/25/30	1 x 8 mm
		TC Ryder Straight	5 mm	18/25/30	1 x 10 mm
14	Chordae Tendineae Sizer	Chordae tendinae sizer with locking mechanism for fixation of measured length ranging between 5-60 mmlength.		41 cm	
15	Magnetic Needle Finder	Magnetic needle retreiver bar		26	
16	Long Cardioplegia Needle	MIS Long straight cardioplegia needle	3 mm	26 cm	

Note:

- CE should be mentioned on each instrument.
- Instuments should be of high quality and standard
- Instrument should be coated with Tungsten carbide or Daimond dust
- All instruments should be European CE or USFDA approved. Copy of certificate is to be enclosed with bid.
- Must submit user list and performance report within last 5 years from major hospitals
- Demonstration of all the instruments is must
- Manufacturer should ISO certificed. Copy of certificate to be enclosed.
- Bidder should quote for all the instruments

Group-C: General Surgery

1: 4K HD Endoscopy System

System Configuration:
4K HD Video Processor with inbuilt Multi LED Light Source
HD Video Gastroscope
HD Video Colonoscope
HD Video Duodenoscope
HD Reporting Software
Trolley
4K HD Medical Graded Monitor
Leakage Tester
Technical Specification:

A. 4K HD Multi LED Video Processor

1. It should have dual port for the connection of both CCD and CMOS typeendoscopes from same manufacturer.
2. It should be equipped with a minimum of 5 LEDs allowing a brilliantillumination.
3. It should have the ability to provide a crispy frozen image with the imagefreeze function.
4. It should be equipped with 7" touch screen front panel. The screen should becustomizable by defining buttons for individual user profiles.
5. It should have brightness control system Auto (Average/Peak) and Manual ±5Step adjustment.
6. It should have color correction Red/Blue ±5 Step adjustment.
7. It should have facility for 2xUSB port on front and rear panel.
8. It should have Port to support 4K HD image output such 12G-SDI whichshould support Resolution min up to 3840 X 2160.
9. It should have Digital output DVI, 3G-SDI, HD-SDI for 1920x1080/60 alongwith analogue output Y/C and digital input DVI.
10. It should also have a facility of internal memory.
11. It should have Auto-HDR facility to deliver a bright image from the near viewto far view and minimizes noise and halation at the same time.
12. It should facilitate DICOM/PACS compatibility.
13. It should have PIP feature in processor.
14. The processor should have compatibility with existing available High-end GI,Pulmonology, EUS, EBUS scopes along with future generation series of scopes
from same manufacturer.
15. It should have latest Digital & Optical image enhanced endoscopy featuresboth I-SCAN and OE.
16. It should have Twin mode to display 1:1 image between WLE and Imageenhanced endoscopy image.
17. It should have Internal and External Image and Video (mp4) recordingfeature.

B. HD VIDEO GASTROSCOPE

1. It should have HD+ Image Output.
2. It should have a waterproof one -touch connector.
3. It should have Field of View 140 Degree or more.
4. It should have Depth of field 3-100 mm or more.
5. It should have Tip Deflection Up: 210° Down: 120°, Right: 120° & Left: 120°
6. Insertion Tube Diameter should be 9.8mm or less.
7. Minimum Instrument channel should be 3.2mm or more.
8. It should have working length of 1050mm approximately or more.
9. Total length approx. 1360 mm or more
10. It should have water jet system for advanced therapeutic procedures.
11. It should have a rotatable PVE Connector by 180 degrees to avoid damage toLG Cable.

C. HD VIDEO COLONOSCOPE

1. It should have HD+ Image Output.
2. It should have waterproof one -touch connector.
3. It should have Field of View 140 Degree or more.
4. It should have Depth of field 3-100 mm or more.
5. It should have Tip Deflection Up: 180° Down: 180°, Right: 160° & Left: 160°
6. Insertion Tube Diameter should be 11.6mm or less.
7. Minimum Instrument channel should be 3.8mm or more.
8. It should have working length of 1700mm approximately or more.

9. Total length approx. 2050 mm or more
10. It should have water jet system for advanced therapeutic procedures.
11. It should have graduated flexibility GDF feature- i-Flex and True Torque.
12. It should have a rotatable PVE Connector by 180 degrees to avoid damage toLG Cable.

D. HD VIDEO DUODENOSCOPE
1. It should have HD+ Image Output.
2. It should have a waterproof one -touch connector.
3. It should have Field of View 100 Degree or more.
4. it should have direction of view 102° (retroflexed view 12°)
5. It should have Depth of field 4-60 mm or more.
6. It should have Tip Deflection Up: 120° Down: 90°, Right: 105° & Left: 90°
7. Insertion Tube Diameter should be 11.6mm or less.
8. Minimum Instrument channel should be 4.2mm or more.
9. It should have working length of 1250mm approximately or more.
10. Total length approx. 2050 mm or more
11. It should have compatible reusable detachable distal end cap.
12. It should have a rotatable PVE Connector by 180 degrees to avoid damage toLG Cable.

E. 27" or more 4K Medical Grade Monitor
F. HD Recording Software
G. Trolley
H. Leakage Tester

2: Advance Visualization Tower- 3D in 4K resolution with Fluorescence Imaging (ICG)

1	**Processor**
	Processor for following should be quoted.: 2- Dimensional endoscopic video camera in 4K resolution (3840*2160) 3-Dimensional endoscopic video camera in 4K resolution (3840 *2160) Slot for Video Scopes (Digital Scopes/Chip on tip) likeVideo Choledochoscope,VideoCystoscopes etc. System should have facility for Optical Contrast Differentiation System, and it Should have special filter for observation of capillary vessels and fine patterns in the superficial layer of mucosa for early detection of lesions. System Should be capable of Near Infrared Fluorescence Imaging (ICG application) with below features: **Overlay:** White light image with superimposed display of NIR/ICG fluorescence. Possible to select the preferred color for NIR/ICG imaging: Either blue or green. **Monochromatic:** NIR/ICG fluorescence signal in white. Background in black for maximum contrast. **Intensity Map:** White light image with superimposed display of NIR/ICG fluorescence. NIR/ICG signal display will appear in different colors depending on the strength of the detected NIR signal. Picture in Picture of visualization modes with Standard and Optical Contrast Differentiation. Automatic adjustment of light intensity of light source and controlled from Camera head. Inbuilt recording facility for both Images and Videos or Medical Grade External recorder should be provided to record both Images and Videos. Outputs: All Compatible outputs should be there (12GSDI, Display Port) for 4K resolution and DVI for HD resolution.
2.	**32- and 55-Inch Monitor 1 each**
	ALL in one Medical Grade Monitor capable of displaying: • 3D in 4K resolution

	• 2D in 4K resolution • 2D in Full HD resolution • 3D in Full HD resolution Should be supplied with 3D glasses – 10 Nos Certified to: ANSI/AAMI ES60601-1:2005, UL 60601-1, CAN/CSA C22.2 NO.60601-1:14 und EN 60601-1. CE label according to MDD, class I.
3.	**LED Light source with ICG facilityincluding Fiber optic cable**
	Should have Lumen >2000 Lamp life of approx. 30,000 hrs. 4.8mm Fiber Optic Cable and 300cm Long – Two No. Should have touch display which provides an intuitive & user-friendly interface that directly displays relevant data. Lamp type: High-performance LEDs, white light LED and near infrared LED, which are active individually or simultaneously. Certified To: - IEC 601-1 & UL 544 CE According to MDD, protection class 1/CF
4.	**IMAGE/VIDEO RECORDING, DATA ARCHIVING, SIGNAL MANAGEMENT & STREAMING**
	➢ Medical grade documentation unit with CE. ➢ Controllable via Touch screen of size 10" or more. ➢ Capture video & images in 4K, UHD, Full HD, 3D & audio files. ➢ Internal storage of 2TB & more. ➢ Should have minimum of 8 inputs and 8 outputs. ➢ All inputs and outputs should be capable of routing 4K,3D and Full HD signals in native resolution. ➢ USB support for storage on USB drives. ➢ Supports network storage on file servers. ➢ Offer two channel simultaneous recording for still images & videos. ➢ Shall have HL7 connectivity. ➢ Shall have DICOM connectivity. ➢ WHO certified Patient Safety Checklist. ➢ Surgical video & image unicast streaming in Full High Definition (1920 X 1080) over local area network to multiple participants. ➢ Offer Bi-directional video transmission & bi-directional audio transmission over LAN. ➢ Streaming picture with telestration and controllable to all participants.
5.	**4K Camera Head**
	Technical Specifications: Pixel: 3840 X 2160 Pixels AGC: Microprocessor controlled Lens: Integrated Zoom Lens f = 19 mm Color Space BT.2020 emulation Control buttons: 3 (2 of them freely programmable). Camera Head Should be able to perform both White light and Near Infrared application.
6	TELESCOPES for 2D
	Telescopes with the 4K system should be quoted with Dimensions as below for White light and Near Infrared application (ICG). 10mm, 0 Degree &30 Degree with 300mm or more working Length – 1 Each. 5MM,30 Degree with 290 mm or more working Length – 1 QTY. Telescope, diameter 10 mm, length 32 cm, autoclavable, variable direction of view from 0° – 120°, adjustment knob for selecting the desired direction of view, fiber optic light transmission incorporated.
7	**Telescopes for 3D in 4K resolution with integrated camera head**
	3D imaging via two distal 4K sensors Camera and Telescopes should be one piece 10mm 30 degrees - 1 No. Switching of 3D to 2D can be done. Free from Focus and Depth of Filed should be 30-200mm Autoclavable. Sterilization tray for the scope should be quoted. 3D Should be able to perform both White light and Near Infrared application.

8. Electronic CO_2 Insufflator

SPECIFICATION OF ELECTRONIC CO2 INSUFFLATOR:
> Fully automatic, electronically controlled gas fill
> Adjustable flow rate of minimum 50 liter per minute or more and pressure range adjustable between 0 to 30 mm Hg
> Optical and acoustic warning signals in case of malfunction or excessive pressure with automatic release of over pressure by back flow
> Selective connection to medical gas pipeline as well as direct connection to high pressure CO2 cylinder should be available
> Control by keys on front panel
> Clear and adjacent front display of actual and preset flow rate, actual and preset pressure, gas consumed.
> Facility for preheating of gas should be available with either internal or external heating device to avoid liquid CO2 entering into system and to maintain good adiabatic change of liquid Co2 into gas.
> Should have standalone smoke evacuation system that should be connected evacuation system of OT.
> Memory for retention of previous pressure settings
> Should include pin-index connection to small/big gas cylinder with regulator, high pressure hose, mains cord, universal wrench and gas filter.
> It should be supplied with connector & adaptor to connect to central CO2 gas supply within OT.
> It should be supplied with 10 Nos of silicon patient tube.

9. Smoke Evacuation System

The system should be compact and complements the existing product range for endoscopic interventions.
The system should provide excellent visibility through effective smoke evacuation and extracts unpleasant odors.
Should include a footswitch to provide surgical smoke evacuation for standalone activation during Laparoscopy surgery
Electrosurgical Integration Compatibility: Automatic activation via ESU footswitch of advanced ESUs
Should be compatible with Insufflators ranging from 20L to 50L flow capacity
Should have parallel suction and smoke evacuation facilities
Multi-specialty usage & compatibility for urology shaver system
The system should be operated via separate foot switch.
Technical specification:
Power Supply: 100-240VAC
Power Frequency: 50/60HZ.
Power consumption: 30W
System should be supplied with all accessories.

10. VIDEO CART FOR LAPAROSCOPY

Basic Video cart, rides on 4 antistatic dual wheels, 2 equipped with locking brakes, 3 fixed shelf's, one with handles, main switch at vertical beam.

Drawer unit with lock, 3 horizontal cable conduits, one with cable winding, two with 4- times Electrical sub-distributer, 1 set of non- sliding stands for units, 1 TFT- Monitor arm (VESA 75/100.

1 camera holder, 8 power cords (50cm),1 power cord (2m), 2 equipment rails, 1 CO2- bottle holder, max. diameter 155mm, Isolation transformer 230VAC (50/60Hz) with 8 sockets and earth potential and Earth leakage monitor (2000VA), Dimensions: Video cart 730 x 1470 x 716mm (W x H x D), shelf: 630 x 480 mm (W x D), caster diameter: 150 mm.

Should have the option of upgrading with Swivel Arm on both the sides for secondary Monitors

Video cart should of same OEM

Instruments :	**Qty :**
1. **Reusable Veress 10 & 13 cm Pneumoperitoneum Needle**:-Spring loaded blunt styletluer lock length 10 / 15 cm.	3 No.
2. **Reusable Trocar : 5 mm**.:-Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	4 No.
3. **Reusable Trocar : 10 / 11mm :-**Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	4 No.
4. **Reusable Trocar : 12 mm:-**Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	3 No.
5. **Safety Trocar with Port.:-**10 mm length approx 10.5 mm.	4 No.

6.	**Spare Sealing Trocar Caps for Trocar. :-**5 – 6 mm.	4 No.
7.	**Spare Sealing Trocar Caps for Trocar. :-**10 – 11 mm.	10 No.
8.	**Reusable Reducer Sleeve. :-**10 / 11 mm to 5 / 4 mm.	10 No.
9.	**Reusable Reducer Sleeve.:-**12 mm to 6 / 5 mm.	5 No.
10.	**Suction and Irrigation Cannula. :-**Size 5 mm, length 36 cm, used with suction and irrigation handle.	5 No.
11.	**Grasping Forceps – Toothed 2 x 4 Teeth.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
12.	**Grasping Forceps – Toothed 2 x 3 Teeth. :-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
13.	**Maryland Forceps.:-**Double action jaws , rotating with connector pin for unipolar coagulation, size 5mm, length 33-36cm, dismantling facility.	4 No.
14.	**Grasping Forceps – Atraumatic. :-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
15.	**Grasping Forceps – Allis.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility	2 No.
16.	**Grasping Forceps – Rt Angled.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility**.**	2 No.
17.	**Grasping Forceps – Mixter.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
18.	**Grasping Forceps – Plain Dissection &Grasping.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling	4 No.
19.	**Grasping Forceps –** Babcock.Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
20.	**Fan Shaped Retractor.:-**Rotating, size 5 mm, length 33 -36 cm, dismantling facility.	2 No.
21.	**Nathanson Liver Retractor.:-**Set of four sizes (45, 55, 78, 95 mm), sandblasted to eliminate light reflection with table attachment for holding the retractor & camera arm.	1 No.
22.	**Hook Scissors.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	6 No.
23.	**Micro Scissors.:-**Single / Double action jaws, size 5 mm, length 33 – 36 cm.	4 No.
24.	**Laparoscopic Knife.:-**5 mm, 30 – 36 cm length.	2 No.
25.	**Rotating Metzenbaum Scissors.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	4 No.
26.	**Bipolar Coagulating Forceps.:-**Size 5 mm, length 33 – 36 cm fenestrated.	2 No.
27.	**Bipolar Coagulating Forceps.:-**Size 5 mm, length 36 cm, 3 mm width of jaws.	2 No.
28.	**Maryland Bipolar.:-**Double action jaws, rotating with connector pin for bipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	3 No.
29.	**CO2 Connector.:-**Compatible with CO2 “B” type cylinder.	2 No.
30.	**High Frequency Cord.:-**For 5 mm & 10 mm hand instruments with monopolar electrodes, spatula tip.	2 No.
31.	**High Frequency Cord:-**For 5 mm & 10 mm hand instruments with monopolar electrodes, hook tip.	2 No.
32.	**Knot Pushers.:-**Eye type, length 33 – 36 cm.	2 No.
33.	**Needle Holder Coaxial Type.:-**Size 5 mm, tungsten tip, straight handle with ratchet, single moving jaw, length 33 – 36 cm.	2 No.
34.	**Assistant Needle Holder.:-**Size 5 mm, tungsten tip, straight handle with ratchet, single moving jaw, length 33 – 36 cm**.**	2 No.
35.	**Clip Applicator – Medium Large**.:-Rotatable, provision for locking the shaft conveniently, 10 mm, compatible with clip	3 No.
36.	**Trocar under optical vision:-**Trocar with endo tip size: 10mm & 5 mm, cannula rotatable with multifunction valve, working length: 11cm. The endo tip cannula should compatible with 10mm telescope for under vision entry into peritoneum.	3 No.
37.	**Grasping Forceps – Toothed 2x 3 Teeth.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 10 mm, length 33 – 36 cm, dismantling facility	3 No.
38.	**Grasping Forceps – Toothed 2x4 Teeth.:-**Double action jaws, rotating with connector pin for unipolar coagulation, size 10 mm, length 33 – 36 cm, dismantling facility.	3 No.
39.	**Suction Irrigation Cannula.:-**10mm	2 No.
40.	**Stone Extractor.:-**10 mm single / double action Jaws.	2No.
41.	**Hassan Cone.:-**Adaptable to 10 mm trocar.	2No.
42.	**Bowel Grasper.:-**10 mm fenestrated, rotatable.	2 No.
43.	**Blunt Obturator. :-**For 11 mm port.	2 No.
44.	**L – Hook.:-**Size 5 mm, length 33 – 36 cm with pin for cautery. Well insulated hook with small un-insulated working part.	6 No.

45.	**Spatula.:-**Size 5 mm, length 33 – 36 cm with pin for cautery.	2 No.
46.	**Fascia Closure Instrument:-**Size 2.8 mm, length 17 cm.	3 No.
47.	**Washers:-**For 5 & 10 mm cannula and reducers.	20 No.
48.	**Container : Metal & Plastic.:-** For sterilization and storage of telescopes Different sizes.	2 No.
49.	**Container : Metal & Plastic.:-**For sterilization and storage hand instruments and other accessories, Different sizes.	2 No.
50.	SCISSORS INSERT WITH OUTER SHEATH, CURVED, DOUBLE ACTION JAWS, LENGTH OF BLADES 17 MM, SIZE 5 MM, LENGTH 36 CM, STERILE, FOR SINGLE USE, PACKAGE OF 10	1 set

3: Echo Portable Color Doppler Equipment with Tee for OT

Sr.	Name of items with specifications
1.	**Echo Portable Color Doppler Equipment** • It should be a State of the art Digital Technology System & should be capable of performing Imaging applications ofabdomen, Obstetrics, Gynecology, cardiac , pediatric, small parts, vascular • The system should incorporate facility for High-resolution 2D, M Mode, PW, CW, Colour Flow Imaging, Colour Power Angio Imaging, Directional Colour Power Doppler Imaging modes. System should have Triplex Mode simultaneity, all three modes (2D, Colour & Doppler Modes simultaneously). • The system should have HPRF mode, anatomical M mode, trapezoid imaging on linear probe , B & C live , Quad display , Duplex for simultaneous B & Spectral Doppler. • Should have powerful multi beam parallel imaging. • System should support Trapezoidal imaging on liner probe or equivalent • System should support extended field of view imaging or equivalent. • It should have panoramic imaging. • There must be Anatomical M Mode (3 lines cursor free from origin) which can help to get 3 simultaneous valve motions. • System should have Tissue Doppler Imaging and Tissue Doppler Imaging Quantification Analysis is upgradeable. • System should have 3D/4D upgradability • Facility for independent steering of B mode and Color beam on linear probe The system should provide 100 dB or more full time input dynamic range, this should be supported by technical data sheet. • System should have Pan Zoom facility on live and freeze image • System should have Full screen imaging (image should come on full screen online & offline) • Should have one touch image optimization & automatic real-time Doppler tracing • System should be new generation ergonomically designs to curve minimum injury to the operator. • System should have a High resolution LCD Monitor of medical grade 15 inches or more, anti glare & maximum viewing angle. • System should have Image Management facility with facility for direct storage of Images and loops in the Hard Disk Drive and also thumbnail review to view & edit Images, loops and also reports. • Equipment should have in built 320 GB HDD to store images and cine loops. • Equipment should have the facility to store Cine loops minimum 1500 frames • System should have 1-1.5 hours battery back up. • Archive-should have inbuilt USB Drive with the facility to transfer images. • Should have direct connectivity to Inkjet printer for printing images & report • The system should have automatic quantification of Doppler parameters to display user-selected measurements. • The system should have extensive Calculation software package for Cardiac and vascular measurements. • The quoted model should be both CE marked and US FDA approved. Requisite certificate should be attached failing which the tender will be rejected. • Equipment with above features to be offered with the following Multi frequency probes, all probes must have THI frequencies • Multi frequency convex array probe of 2 – 6 Mhz • Multi frequency linear probe of 5-10 Mhz. • Multi frequency endocavity probe of 5-8 Mhz

4: Surgical Skill Lab

Sr. No.	Name of the Equipment with Tender Specifications

	Tender specification for Surgical Skill Lab for Post Graduate : **1: Surgical skills suite – suturing, bandaging** **2: Advanced Surgical Suture Arm** **3: Laparoscopy Training Simulator/ Laparoscopy Endo Trainer Set with TV** **4: Tracheostomy Simulator Kit** **5: Advanced CPR Adult Model** **6: USG Guided Thoracentesis Simulator** **7: Advanced Trauma Care Mannequin (ATLS and BTLS Modules)** **8: Catheterization Trainer** **9: Chest Tube Insertion Simulator** **10: Laparoscopic VR Simulator with Advanced Full Procedure Modules**
	General Terms & Conditions : **1: The bidder should have a registered office in India.** **2: The principal Company should have a technical team based in the region, along with educational support and a training expert.** **3: The Principal company should help in integration of educational curriculum with the purchased mainkins and simulators.** **4: All high fidelity manikins should be controlled by an uniform operating system** **5: The principal company should offer the upgrades as the newer models / software update comes.** **6: The bidder must quote all the items to qualify as bidder.** **7: All manikin / simulator should be from one bidder for full integration of the solutions.** **8: The principal company should provide on-side educational support on each item supplied.**
1	**Surgical skills suite – suturing, bandaging**
	The task trainer should help gain the following skills:
	- One-handed reef knot technique
	- Instrument tie
	- Surgeon's knot
	- Slip knot
	- Tying in a small opening
	- Tying at depth vertically ina large opening
	- Tying at depth, at an angle, in a large opening The product should contain the following features:
	- The product should be light and compact.
	- The cylinders should be transparent to allow the trainer to observe and assess trainee competence.
	- There should be an unique magnetic system to represent tissue strength
	- There should be parallel knotting tubes which are elastic for a realistic tissue response
	- The product should be latex free
	- Anatomically, the 2 perioperative openings should be represented by a small, shallow fixed cylinder for tying in a small opening; and a large, deep, removable cylinder, reversible for angled abdominal and gynaecological depth tying.
2	**Advanced surgical suture arm**
	The trainer should contain the essentials for practicing suturing, knot tying, instrument handling and incision of skin. It can be used as a stand-alone teaching and practice tool
	The task trainer should help gain following skills:
	- Instrument handling
	- Planning and performing a skin incision
	- Tying safe and secure knots
	- Suturing techniques - interrupted, continuous, subcuticular, vertical and horizontal mattress
	- Suture removal
	The product should have following features:
	- Skin pad jig should present the skin pad on a curved, life-like profile allowing incisions to ‘gape', as in real life.
	- It should have an advanced 3 layer skin pad to give realistic tissue and should be suitable for practicing a wide rangeof suturing techniques.
	- Should have realistic tissue response and soft skin with a similar drag and strength to human skin.
	- All layers should have realistic retention of sutures.

3	**Laparoscopy training simulator/ Laparoscopy endo trainer set with TV**
	Should be made of vacuum formed special high impact plastic designed in the shape of enlarged human abdomen to create virtualsurgical environment for laparoscopic training.
	Inbuilt high-resolution camera of reputed make with pal or NTSC compatibility should be provided for hand free operation.
	The camera should be fitted on a stand suitable to turn from 30-45 degree for adjusting inside vision.
	Built in illumination with fluorescent light accommodated inside the shell
	At least 5 holes of 32 mm diameters with silicone rubber gasket with 12 mm groove should be provided for trocar insertion.
	The base tray should be laminated with anti-friction elastomer sheet to avoid slipping of training material kept inside
	Should be supplied with 2 plastic trocar, operating cum training manual, training kit for basic laparoscopic training, abdominal wallsimulators, bowel intestine, assorted arteries, veins and skin pads for advanced training.
	Should be supplied with power cable, power supply and cable to connect to TV/LED/LCD/Screen, etc.
	Overall, the dimensions should be approximately - 560 - 600 mm L x 390 - 290 mm W x 180 mm l. One 21 -inch LED/LCD monitorof a reputed company should be provided.
	In addition, the following accessories should be provided:
	- 2 needle holders: 5 mm & 10 mm standard instrumentation: 30 - 35 cm long
	- 2 Grasper: 5 mm & 10 mm standard instrumentation: 30 - 35 cm long
	- 2 Dissectors: 5 mm & 10 Mm standard instrumentation: 30 - 35 cm long
4	**Tracheostomy simulator kit**
	Needle and surgical cricothyrotomy skills should be practiced on this model with interchangeable rigid and soft tracheas and shouldhave following features:
	- Anatomically accurate landmarks for site training
	- Interchangeable tracheas facilitate realistic simulation of needle and surgical cricothyrotomy procedure:
	1) Rigid trachea with simulated lung;
	2) Soft trachea with simulated lung
	- Replaceable neck skin which allows repeated practice
	- Mounted on a base
	- Should be ISO/CE certified
	The manikin should be supplied with head, rigid trachea with simulated lung, soft trachea with simulated lung, replaceable neckskin, base, and directions for use.
5	**Advanced CPR Adult Model**
	The manikin should fulfil the following standards and teaching goals:
	- Should comply with AHA 2015 recommendations.
	- The manikin should provide feedback on all 5 key points of CPR that is depth, chest recoil & rate of the compressions;interruption time and ventilation volume.
	- The manikin should be able to provide overall CPR performance score and performance de- briefing.
	- Should provide visual graphical user-friendly feedback.
	- Should allow instructor to monitor multiple students' performance at one time through smartphones.
	The following anatomical specifications should be fulfilled:
	- Should be a half body manikin with accurate anatomical landmark resembling an adult.
	- Should have nose, eyes, ear canal, articulating mandible to teach the students C-E technique for mask holding.
	- Should allow nose pinch technique for mouth to mouth resuscitation.
	- Should have naturally obstructed and the airway to be cleared only when head/tilt or jaw thrust is performed.
	- Should have collar bones to identify shoulder allowing to teach tap and shout.
	- Should have nipples, sternal notch, belly button and ribs to teach hand placement for chestcompression.
	The following hygiene specifications should be met:
	- Should have removable face skin and one additional face skin to be provided.
	- Should have one-way non-rebreathing lungs and to be provided with one extra airways The following technical specificationsshould be fulfilled:
	- Should be portable and light weight

	- Should be able to connect to feedback devices wirelesses.
6	**USG guided thoracentesis simulator**
	It should be used for training in surgical or guidewire assisted thoracostomy, and thoracentesis. It should be complete withinterchangeable modules, allows for a variety of chest drain insertion techniques to be performed including-ultrasound-guidedtechniques.
	The following skills should be covered by the simulator:
	- Needle decompression of tension pneumothorax
	- Ultrasound-guided chest drain insertion (Seldinger-type), including insertion of needle under direct vision, and ultrasonicrecognition of chest structures
	- Open, or cut-down chest drain insertion: recognition of correct position, surgical incision, blunt dissection through chest wall, perforation of pleura, and finger sweep
	- Suture of tube to chest wall
	- Representation of adult male thorax with arms raised
	- Suitable for supine, sitting, or leaning forwards positions
	- Bony and soft tissue landmarks: manubriosternal joint, clavicles, ribs, pectoralis major and latissimus dorsi
	- Bilateral chest drain and needle decompression pads
	- Internal ultrasound anatomy: diaphragmatic structures and collapsed lung
	- Can give the impression of breathing under ultrasound
	- Should work with thoracic seals
	- Reservoirs can be filled with fluid or mock blood to represent pleural effusion The following should be the Ultrasound-ablefeatures of the simulator:
	- For use with liquids - e.g. effusion, or haemothorax
	- Needle, guide-wire, dilator, and drain-tube should all be realistically inserted
	- Guidewire insertions should self-seal allowing multiple uses
	- For open/surgical techniques where effusion or haemothorax are required
	- Open/surgical incisions mayor may not notself-seal
7	**Advanced trauma care mannequin (ATLS and BTLS modules)**
	A set of wound lay-ons, blood splats, and simulated blood should be designed for use on manikins or humans to simulate injuriesrequired in the BTLS instructor with the following features:
	- Distended jugular vein
	- Burns -1st, 2nd, 3rd degree
	- Projectile entry/exit - large and small
	- Exposed viscera
	- Compound fracture
	- Simulate injuries required in 12 patient scenarios (BTLS Instructor's Manual)
	- Wound lay-onsw/velcro design, more than 30
	- Contusions
	- Lacerations
	- Abrasions
	- Cervical spine injury
	- Flail chest segment
	- Impaled object
	- Stab wound
	- Closed fracture
	- Blood splats - simulated
	- Stage blood (included)
	- Simulated blood, included
8	**Catheterization trainer**
	- **Life-size female pelvis should be with interchangeable genitalia designed for practicing urologic and rectal accessgastrointestinal care procedures.**

	- Should have realistic articulation enabling proper positioning for procedures
	- Should have interchangeable male and female genitalia.
	- Genitalia, when used with urinary connectors and reservoir, should facilitate urologic care procedures such as perineal care,insertion of vaginal medications and indwelling catheter insertion, care, irrigation and removal.
	- Genitalia, when used with anal connectors and colon reservoir, should facilitate enema administration using fluid for realisticreturn.
	- Should have abdominal plate with interchangeable stoma site, allowing simulation of cyctostomy tube care and urinary diversionstoma care.
	- Should have single plug with valve in abdominal plate, used to pressurize the reservoir during urinary catheterization procedures.
	- Should have bilateral thigh, dorsal gluteal, and ventral gluteal 1M injections possible.
	- Must be CE/ISO Certified.
	- The kit should be supplied with 1 Female pelvis with thighs, 1 male genitalia, 1 female genitalia, 3 urinary connector valves, 3anal connector valves, 1 carry case and directions for use.
9	**Chest tube insertion simulator**
	The manikin should be designed for training central venous access and chest decompression with the added benefit of airwaymanagement features like:
	- Airway management by manual maneuvers and mechanical devices
	- Intubation (oral and nasal)
	- Oropharyngeal and nasopharyngeal airway insertion
	- Manually generated carotid pulse
	- Stomach auscultation to verify proper positioning
	- Abdominal Thrust Maneuver
	- Closed chest compressions
	- Tension pneumothorax decompression (mid-clavicular and mid-axillary)
	- Subclavian cannulation (right side)
	Should Include: 1 adult male torso, 1 bladder replacement kit, 1 can of manikin lubricant, 1 tank top, 1 carry case and directions foruse
10	**LAPARPSCOPIC VR SIMULATOR WITH ADVANCED PROCEDURE MODULES**
	• The system should be fully computerised and interactive.
	• Should have PC and virtual reality simulation processor
	• Should have 24" flat LCD touch screen
	• Should have elevation mechanism for height adjustment
	• Should have foot switch for electrosurgical coagulation
	• Should have high performance force feedback with three (3) degrees of freedom
	• Should have tool tracking with five(5) degrees of freedom
	• Should be High performance and precision
	• Should have a variety of optical angles: 0 , 30 and 45
	• Should have adapted instrument handles (graspers)
	• Should have interchangeable suturing handles with suturingmodule
	• The system should be able to provide comprehensive training in the field of laparoscopic surgery.
	• The system should allow for individual training and allow for a Team Training by plug-and play-connection of the portable system(Team Training in certain modules).
	• The system should contain at least 19 modules.
	• The system should have all parameters to evaluate trainee.
	• The system should have Web based Simulator Curricula Management System, providing the optimal solution for managingsimulation based training and education needs
	o Should facilitate performing the administrative tasks of running a training course or workshop.
	o Should offer extensive library of courses including a library of ready-to-use simulator based courses and a platform to design newones. Courses may online didactic content, proficiency based hands-on training and performance review and assessment.
	Virtual operating Room Setting –VR-OR

	Basic and advanced suturing skills
	Lap Cholecystectomy skills and full procedures
	Lap Incisional Hernia
	Lap Inguinal Hernia Module
	Lap Appendectomy skills and full procedures
	Cholangiography Module
	Lap Full Gastric Bypass
	Lap Lobectomy Module
	Lap Nephrectomy and full procedures

5: Simulator for Adult Fast Examination

General Characteristics:

- The simulatorshould enable comprehensive training in the field of robotic surgery
- The simulator should be in a self-contained unit (standalone)
- The simulator shouldenable individual training as well as team training

Platform

- The simulator shouldoffer authentic hardwareand user experiencerepresentation consistent with the clinical da Vinci Si and Xi surgical robot system
- The simulator should offer a similar workspace as the actual da Vinci console workspace, with no physical limitation, allows freedom of movement without mechanical restrictions or wire friction
- The simulator shouldrequire**no calibration** of the master controls
- The simulator should fully computerized and interactive, includes a PC and virtual reality simulation processor
- The simulator should include a 27" touch screen monitor
- The simulator should includea work area with the following components:
    - 3D stereoscopic vision
    - Armrest
    - Master controllers
    - Foot pedals
- The simulator should offerdisplay elevation and tilt mechanism for height adjustment
- The simulatorshould offeradjustable height and position of foot pedals
- The simulator should not require any consumables
- The simulator should be CE and ISO certified

Modules:

- The simulator should allow practicing modules of different versions of the da Vinci surgical robot (da Vinci, da Vinci S, da Vinci Si and da Vinci Xi)
- The simulator should allow practicing key steps of several procedures in a Virtual Reality simulated anatomical environment (not a pre-recorded video environment)
- The simulator should offer interactive step-by-step procedural guidance, anatomy recognition and video-based training
- The simulator should enable hands on training of Virtual Reality **Robotic Assisted Radical Prostatectomy**procedure module
- The simulator should enable hands on training of Virtual Reality **Robotic Assisted Radical Prostatectomyteam training in a procedural environment**
- The simulator should enable hands on training of Virtual Reality **completeHysterectomy** procedure module
- The simulator should enable hands on training of Virtual Reality **complete Hysterectomyteam training in a procedural environment**
- The simulator should enable hands on training of Virtual Reality **Hysterectomy Tasks** procedure module
- The simulator should enable hands on training of Virtual Reality**Vaginal Cuff Closure**procedure module
- The simulator should enable hands on training of Virtual Reality**complete Lobectomy**procedure module
- The simulator should enable hands on training of Virtual Reality **complete Lobectomyteam training in a procedural environment**
- The simulator should enable hands on training of Virtual Reality**Inguinal Hernia**procedure module
- The simulator should enable hands on training of Virtual Reality**Right Hemicolectomy**procedure module
- The simulator should offer on screen **guided full procedures and procedural tasks as well as freehand** non guided cases
- The simulator should include simulation of **complications** such as injuries to key structures and bleedings
- The simulator should allow **practicing control of complications**

Management System:

- The simulator should offer optional offline or **online** curricula management system
- The simulator should offer the following**online** curricula management system capabilities:
    - Centralized management of one or more simulators
    - User and group registration and administration
    - Access to didactics content: descriptions, objectives module books, tutorials and real-life videos.
    - Access to ready to use course
    - Access to the performance reports.
    - Export of reports to files.
    - Creation and modification of proficiency benchmarks
- The simulator should allow tracking of all parameters to evaluate trainees
- The simulator should**include video debriefing capabilities**
- The simulator should present andallowsexport of performances reports
- The simulatorshould present learning curve for research and future certification
- The simulator should allow setting benchmarks/training goals for procedure metrics
- The simulatorshould include the followingReporting and Assessment categories:
    - Time and economy of movements
    - Safety and electrosurgical dissection
    - Procedural errors
    - Procedure specific checklist items relating to knowledge of procedures, and handling of instruments
- The simulator should offer tools for administration of users, and curricula design
- The simulator should offer ready to use curricula and courses from leading institutes
- The simulator should offer courses for learners of all levels
- The simulator should offervideos of real-life procedures for better learning.

6: Paediatric Fast and Acute Abdominal Ultra Sound Phantom

SPECIFICATION
State of the art high end Color Doppler System with 'Full Digital Technology' for Whole Body applications to include Abdominal, Obstetrics &Gynaecology, cardiology Cerebrovascular, Peripheral Vascular, adult Transcranial & Small Parts Imaging Intra-cavitary applications should be available including 3D & 4D applications and vascular as well as calculations. Calculations should be available in frozen mode as well as archived images. Image grabbing software, hardware, image archiving and DICOM connectivity should be standard with the following specifications:
1. (A) System should be offered with following Broad Band width Transducers: asstandard
1.(B) The following Broad Band width Transducers), Whose rates shall be quoted separately
(i) Broad Band Single Crystal Technology Convex Array Transducer (frequency range of 2 to 6 MHz)
(ii) Broad Band Linear Array Probe (frequency range between 4 to 14 MHz)
(iii) Broad Band Single Crystal Technology Phased Array Transducer (frequency range of 2 to 5 MHz)
(iv) Broad Band Volume curved array Probe (frequency range of 2 to 8 MHz) for 4D Imaging.
(v) Broad Band endocavitary Volume Probe (frequency range of 2 to 9 MHz) for 4D Imaging.
(vi) Broad Band Linear Array Probe (frequency range between 7 to 20 MHz)
2. Incorporate facility for High resolution 2D, M Mode, PW, CW, Colour Flow Imaging, Power Doppler Angio Imaging Modes. The system should have anatomical M Mode as standard so as to do M Mode analysis on a defined line independent of transducer orientation.
3. 10,000,000 digital Channels or more.
4. Employ state of the art Transmit Real Time Compound Imaging Technology (**for all probes)** with multiple transmitted lines of sight.
5. 256 Grey shades or more.
6. All transducers should have Broad Band with technology for extreme High Resolution 2D Imaging.
7. Frequency range of Transducers should be 2 to 20 MHz or more. The system should be able to capture all frequencies without the need for user selection and frequency range of all transducers should be displayed on the monitor.
8. High dynamic range of 250 dB or more.
9. Harmonic imaging for tissues for hard to image patients. System should be able to work in combined mode of Harmonic Imaging and Real-time Compound Imaging to get excellent Image quality.
10. Harmonic imaging in Power Doppler Imaging mode for improved sensitivity and Specificity in differentiating blood/agent from tissue.
11. Panoramic Imaging to have an extended field of view of structures. System should have facility of Tissue Doppler Imaging (TDI) both in colour as well as Pulse wave Doppler

12. Support at least fouruniversal ports. Plus one Parking Port
13. A High resolution Fully Articulating Non Interlaced flicker free, anti glare, Flat Panel LED Display of 21 inches or more with tilt and swivel facility.
14. Fully articulating controls Panel including Height, swivel. Electronic Control preferable.
15. A very high frame rate of 1200 frames per second.
16. Facility for zoom (real-time and frozen image) and manipulation of Image through preprocessing and post processing with cine loop viewing of Images of all modes.
17. Cine-loop review facility in individual and mixed modes with memory up to minimum of 800 images.
18. Facility of digital storage and retrieval of B/w & Color image data (both frozen and cine loops) on built in as well as Removable media (CD &/or DVD). Digital inbuilt storage capacity of one lac images should be available. System HDD should be at least 1 TeraByte.
20. Capable of performing 4D Imaging with special volume Transducers with capability for Fetal Echocardiography. Intima media thickness. (IMT) Measurement and report should be available for calculation of maximum IMT and Mean IMT.
21. The machine should have shear-wave Elastography. Fusion Imaging. The system should be able perform real time combination of CT-MR Modalities.
22. The system should be DICOM Ready and should have HIS & RIS connectivity with any software. The main equipment must be CE marked and US FDA approved. The requisite certificate should be attached with the offer. The bidder should enclose the original catalogue/ literature of the quoted model along with the specification sheet.
23. Automatic Fetal Biometry should be available.
24. System should offer automatic sound speed adjustment for better penetration of fatty tissue.
25. System should have Blood Vector Flow Imaging, where blood flow profiles can be seen with vector arrows in real time.
26. System should have HD zoom
27. System should have integrated Gel Warmer
28. System should have dynamic focusing technology, whereby reducing the need of a focus on the image.
29. System should have auto image optimization on all modes including 2D, Colour, PW, and CW
30. Real time IMT measurement should be available.

7: RFA (Radiofrequency Ablation Machine)

Specifications:
Radio Frequency Ablation Device :
1. It should maximize energy delivery by continuously monitoring tissue impedance & adjusting output accordingly.
2. It should have electrode cooling lowers impedance, allowing more current to pass through the tissue to create a larger ablation zone.
3. It should Minimize treatment time – maximum effect in approx. 12 minutes.
4. It should Monitor all critical performance variable.
5. It should be a User-friendly system.
6. It should enhance Physician control through simple, intuitive needle design & reduce potential injury to vital strictures.
7. It should have Unique electrode design circulates water internally reducing increment in tissue impedance & improves energy delivery.
8. It should have Single & cluster electrodes of assorted sizes are available.
9. It should have 17-gauge electrodes which are easy to insert, minimizing patient trauma.
10. It should have Four different lengths offer flexibility in laparoscopic and percutaneous procedures.
11. It should have Temperature probe which measures ablation zone.
Technical Specification
1. Volt: 220 V
2. Voltage Input range: 200 to 240 V
3. Maximum Input Voltage: 260 Vac
4. Maximum Voltage on any Output Connector: 260 Vac
5. Max Input Power: 420 VA
6. System has an automated 12- minute tissue ablation.
7. Radio Frequency energy is used to heat & coagulate target tissue

8.	The System has 200 Watt power pulses energy for generating larger coagulation volumes.
9.	System adjusts output energy based on tissue impedance using feedback algorithm
10.	System is compatible with Switch Box for multiple ablations at a time.
11.	Impedance: Range – 0 to 1000 Ohms
12.	Current
13.	Power Range – 0 to 200 Watt
14.	Time: Range 1 to 30 minutes
15.	Temperature: Range 10 Degree to 99 Degree
16.	Frequency: 480 k Hz + 10 %
17.	Safety Parameter: Impedance Cutoff < 25 ohms ; > 1000 ohms
18.	Temperature < 10 degree; > 99 degree
19.	External Peristaltic Pump for cooling the tip of the electrode
20.	System is compatible with Both Single & Cluster Electrode.
21.	Electrode has a separate lumen to allow water to pass through for cooling the tip.
22.	System is compatible with Single and Cluster Electrode. The tip of the electrodes is cooled by water (pumped through external Peristaltic Pump).
23.	Flow Rate for Peristaltic Pump: Max Output Flow Rate: 140 ml/min
24.	Minimum Output Flow Rate: 80 ml/min through 1.6 mm (ID) tubing.
25.	US FDA 510 (k)/ European CE (issued by notified body) Approved model should be offered

8: VAAFT System

VAAFT System (Video Assisted Anal Fistula Treatment SET)-

Telescope 8° angled eyepiece with Handle, straight working channel for instruments up to diameter 2.5 mm, length 18 cm, diameter 3.3*4.7 mm, autoclavable, fiber optic light transmission incorporated. 1 Set.
Handle for above mentioned scope- 1 Piece
Obturator for above mentioned scope. 1 Piece
Brush consisting of: 3-Ring Handle, Outer Sheath, 1 Pcs per Fistula Brushes with 4,0mm, 4,5mm and 5,0mm Outer Diameter. 1 set
Fistula Brushes with 4,0mm; 4,5mm and 5,0mm Outer Diameter. 5 Piece each
Coagulating Electrode, 7 Fr., unipolar, length 53 cm- 5 Piece
Endoscopic seal, for single use, working channels for 4-10 fr. Instruments, sterile, package of 10
Two piece laparoscopic autoclavable Grasping Forcep, double action jaws, 360 degree rotational sheeth,with LUER Lock adaptor for cleaning size 2 mm, length 30 cm,with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button. 1 Piece
Distending Speculum, for anal examinations, with 3 blades, outer diameter 27 mm, working length 6 cm, with Obturator, with ratchet. - 1 Piece
Wire basket tray for cleaning, sterilization and storage of Scope. Including cleaning adaptor for washer-disinfector. With lid, spare parts basket 39501XS and silicone telescope holders. External dimensions (w x d x h): 460 x 150 x 80 mm. For instruments with up to 27cm working length.- 1 Piece

9: Portable Diode Laser and Emission

- It should be a 980nm Diode laser for Endo venous laser ablation of Varicose veins.
- It should have 20 watts power.
- It should be microprocessor based.
- It should have Aiming beam – 3mw red diode and 635 nmwavelength.
- Aiming beam brightness should be adjustable Between 2-100%.
- It should have TFT Colour with soft keys and rotary pushbutton(double function switch) or Touch screen display.
- It should have operation mode Continuous, Single, Pulse train and cyclical pulse.

- It should have single Pulse Mode with pulselength 5ms to 9.99s.
- It should have cycle Mode with 5ms to 9.99s pulselength.
- It should have beam Quality with minimum Laser Aperture 0.22.
- It should have signal Level at maximum output of Max 57 dba.
- It should have fiber connection status clearly visible on LCD display.
- Laser Fiber Connector should be SMAX-Socket, mechanically coded SMA socket.
- It should have mechanically Coded Security fiber interface.
- It should have laser emission indicator with Buzzer feature.
- It should have inbuilt air cooling system to withstand long operating procedure time.
- Should come with the safety stand by/ ready touch based control and safety key to lock the device.
- It should have 50 user defined memory storage.
- It should have Activation & Error logs.
- It should have simultaneous visibility of Protocoll, accumulated applied Energy and total laser application time on LCD display.
- It should have Continuous wave and pulsating with 0,5 Hz/1 Hz/2 Hz/3 Hz/4 Hz/5 Hz.
- It should have pilot laser class 3R.
- It should have a footswitch pedal for laser activation.
- It should be a Laser class 4 and Class of protection 1.
- It should be CE/US FDA Certified.
- It should have maximum weight 14 kg.
- Manufacturer should have their direct presence in india with regional service support and authorized local distributor.
- Training for user department's doctors and other OT staffs has to be provided.

Technical specification –Main unit

- Wavelength 980 nm.
- Laser power 0.1-20W.
- CO2 laser tube sealed off, DC-excited.
- Diode pilot laser, continuously adjustable 635 nm, 3mW Light-red.
- Dimension- (381 x 195 x 390 mm).
- Weight-13.8 kg.
- Protection class I.
- Type (of applied part) B.
- Laser class 4.

Main Unit andAccessories

- Diode laser diomax® 980 nm, 20 W, incl. foot switch.
- Catheter set for EVLO operations includes a puncture needle,
  guide wire, ultra-sonically visible venous catheter and a thin laser fiber VENEX 360° (set is delivered in pack. of 5 ea.)
- Laser protective goggles – 4 Nos.

Group-D: G.I. Surgery

1: Modular OT

Supply, Installation, Commissioning & Testing of Modular O. T.

Technical Specifications of Modular OTs :	
S. No.	**Description**
1.	**Walling & Ceiling constructions / Panel**
2.	**Anti Bacterial Paint**
3.	**Antistatic Flooring including leveling, copper taping and connecting to the earth.**
4.	**Laminar Air Flow System (Complete with all required ducting and return air grills of required size.)**
5.	**Automatic Door- Hermetically sealed Sliding Door**
6.	**Single Flap Swing Door**
7.	**Control panel- Membrane type (With AHU monitoring, temperature and humidity monitoring)**
8.	**Distribution Box**
9.	**X-Ray View screens**
10.	**Pressure Relief Damper**
11.	**Peripheral Lights with dimming control**
12.	**Storage Unit**
13.	**Writing List Board**
14.	**Hatch Box**
15.	**Surgical Scrub Sink- Two Bay**
16.	**LED OT Light with HD camera system**
17.	**Flat Panel Monitor**
18.	**Single arm Anesthesia Pendent (Non Motorized)**
19.	**Double arm Surgeon Pendent (Motorized)**
20.	**Medical Gas Pipeline & Fitting inside the O.T. (For Oxygen, Nitrous, Vacuum, Compressed Air.)**
21.	**Isolation Power Transformer System (IPS)**
22.	**Electrical System**
23.	**HVAC system for Modular OT**
24.	**Ultra Violet Lights**
25.	**Touch Screen Monitors with Desk Top**
26.	**Aanesthetic Gas Scavenging Disposal System (AGSS)**
1. Wall & Ceiling Construction	
• Constructed with **0.8 to 1.2 mm** stainless steel panels backed with 12mm to 14 mm gypsum board. Substructure should be fixed on the floor and/or at the wall and/or ceiling. Panels will be fixed with screws onto the substructure. Joints will be filled with silicon dry profiles. Coating of the wall panels have to be a pre-fabricated powder coating with antibacterial silver ions with 60 to 80 microns thickness / **anti bacterial painted**. Return air grills made of stainless steel, grinded or powder coated or aluminum material.	
• All joints will be filled with metal filler and sanded flush on site ready to receive the plastic finish. Wall panel's joints will be invisible after the final wall coating is applied.	
• The cavity between the inner and outer walls will be left with minimum obstruction for the possible addition of equipment at a later date and to enable services, pipes, conduits etc. to be run within the cavity. All wall mounted equipment will be flush mounted and sealed into theatre.	
• The wall panels design and construction will allow for the installation and support of all equipment and the provision of opening required for the installation, without affecting rigidity and strength. Access boxes will be fitted to the rear of all wall mounted equipment to enable maintenance to be carried out from outside the operating room.	
• All the sharp edges and corners will be in radius to avoid bacterial contamination.	
• The internal surfaces of the room walls will be sprayed with water based liquid plastic, wall glaze or equivalent, approved by the client to a minimum dry film thickness of 300 microns. The plastic coating will overlap the floor covering ceiling system and doorframes by 25mm to provide a continuous sealed surface. The plastic coating will be non- reflective and the color will be submitted to the client for approval.	
• All the four corners should have return air duct outlets, the grill of which should be made of MS steel, duly powder coated with colour choice to suit the hospital	
• These panels should have flame resistance to BS1142 part 3	
CEILING SYSTEM	

	• Ceiling should be made of galvanized steel / **stainless steel** minimum 0.6 mm or more with prefabricated powder coating / **anti bacterial painted**.
	• Support Element: Suspension bracket with tension spring.
	• Material: High quality galvanized or powder coated steel.
	• Room lighting, air supply inlet, ceiling service units, return air outlets etc. as should be integrated with SS metal ceiling system.
	• The individual panels except those at the edges should be removable individually.
	• All the four corners should have return air duct outlets and grill for the same made of steel duly powder coated with the color choice to suit the hospital's choice.
	• The ceiling material should be CE certified according to EN.
2.	**Anti Bacterial Paint**
	• Paint should be superior quality, special acrylic based emulsion paint. It should have excellent flow properties and washability. This paint must have good opacity and leveling thereby create high-class finish, also offer resistance against Bacterial and fungal growth on interior walls and should be approved by Ministry of Health.
3.	**Antistatic Flooring**
	• It should be with 2mm antistatic seamless PVC flooring
	• Floor should be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.
	• Electrostatic charge dissipation combat PVC seamless flooring of very high quality should be provided
	• Thickness not less than 3mm.Continuous roll should be used and joints should be welded by special PVC thermal welding units using PVC welding bars of same colour
	• The sheets should be highly durable with resistance to shock and indentation. It should be scratchproof also. The conductive material should be uniformly impregnated as grains
	• It should be inert to body fluids, chemicals and disinfectants. Should not be affected by temperature variation within the OR The floor should efficiently discharge electric charges up to 2 kV
	• Flooring installation should be done by skilled workers of accredited agencies authorized by the supplier of PVC sheets. The electrical resistance (point to ground) should be within $2.5x10^4$ to $5x10^6$ ohms. The floor should not allow build up of electrical charge beyond 100volts due to antistatic effect. The corners should not be terminated sharply and concealed cove- former (aluminum) should be used overlap the wall panel to a height of approx.25mm and sealed perfectly and uniformly. Self leveling compounds should be used for this purpose.
	• The conductive copper grid laid underneath the PVC sheet should be supported by liquid epoxy compounds allowed to set as a uniform and level surface. The copper strips to be made visible by grinding and no copper strip should project more than 0.5mm above level surface to avoid damage to the PVC sheet. One earthling lead should be brought out from every 150 sq.ft area and attaching it to the main earthling strip/ground
	• Copper grounding strips (0.05 mm thick, 50 mm width) should be laid flat on the floor in the conductive adhesive and connected to copper strip of grounding. The connection from copper grid should be brought out uniformly at places to form equipotential grid.
	• Flooring should be mechanically shock proof, scratch proof, flame retardant and anti microbial
	• Corners should be uniformly curved
	• Final surface should be non corrosive to biological fluids and detergents
	• Colour should be uniform pleasant and matching with ambience.
4.	**Laminar Air Flow System:**
	• The ceiling filtration system should be designed to ensure unidirectional distribution of sterile air with differential flow velocities decreasing from centre to perimeter of the surgical theatre to ensure the cleanliness of all the area covered by the air flow.
	• The Laminar flow system should comprise of thick extruded aluminum profiles frame and sealed gasket. The filters installed in the plenum should be suitable for application for laminar flow and clean rooms. These filters should meet following specification.
	• Protective grids : white epoxy painted micro drawn grid Separators : continuous thermo plastic chord Sealant : Polyurethane Gasket : One piece polyurethane MPPS average efficiency: > 99.95% 3 Micron D OP efficiency > 99.99% Final Pressure drop: 600 pa(max) Maximum Operating Temp : 60 degree Celsius Maximum RH : 40-50 %
	• The ceiling system should be equipped with "S" class HEPA filters with different performances according to their position in the ceiling to achieve different flow velocities.
	• The complete filtration ceiling system should be factory assembled. Its holding structure, Filter frames and top plenum should be made of AISI 304 stainless steel.

•	The filtration ceiling system should have flow equalizer to achieve uniform & constant air distribution over the whole surface .it should also have connection for surgical lamp to be fitted in place of any filter
•	The air management system should be designed to achieved the following parameters: F.S. 209 classification = 100 (100 particles/ft3) Bacteriological class =B (5 CFU/m3)* Particle decontamination kinetics CP =5 min Biological decontamination kinetics CB = 5min ECG-GMP Annex 1 classification = Class A ISO 14644/1 classification = ISO 5
•	The positive pressure should be maintained inside the OT to prevent contamination due to air from outside the OT.
•	The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufactures.
Exhaust Air Cabinets:	
•	Return air exhaust cabinets should be provided in the operation theater.
•	The exhaust air cabinets should be openable and cleanable.
•	These cabinets should have suction from top as well as from bottom.
•	Designed flow rate should not be less than 1000 m3/hr. Distribution of exhaust air volume between fluff strainers top should be 400 m3/hr and bottom 600 m3/hr
•	Fixed type exhaust air cabinet (non-openable) type should not be supplied
•	The Exhaust air cabinet should be manufactured and supplied by the supplier of wall and ceiling system supplies.
•	Specification of materials and aesthetic should match perfectly with the ceiling system.
5.	**Automatic Door – Hermetically Sealed Sliding Door**
•	This should be a hermetically sealed, single sliding door of 2.1 (H) X 1.8 m(W).
•	The controller should be capable of being operated by elbow switches/foot switches as well as radar switch (touch less sensor).
•	The track should be of stainless steel/extruded aluminum and the running surface for the top rollers should be suitably angled to reduce resistance to movement.
•	The door leaf should be hung by means of hard plastic rollers of high quality with double bearing at the top. Rollers should be provided under the stainless steel/extruded aluminum track to enable smooth and noiseless movement.
•	Opening and closing of the door should be microprocessor controlled electromechanical movement. Switches for opening and closing should be two, one of proximity type and the other of infrared type.
•	The door material should be SS powder coated fixed to SS frame (same as the wall panels). Colour should match the interior case should be taken to make the leaf strong and light weight.
•	One should be able to open and close the door effortlessly incase of failure of automatic mechanism.
•	Door opening handle should be strong and sturdy. Material should be of SS (gloss finish). Should be provided with high quality cylindrical lock.
•	Door leaf should have high quality synthetic rubber gasket with long life to ensure hermetic sealing (to maintain air pressure differential). Air tightness 99.99% at a pressure of 100KPa.
•	The finished floor on either side of the door should be perfectly level (maximum permissible difference $\pm$1mm)
•	The overall thickness of the finished door should not exceed 60mm. The inner part of the door should not be filled with CFC free polyurethane foam of thickness of 48mm or nearby. (Scaled airtight to prevent further ingress of any microbial organism).
•	The door and controls should comply IEE regulation and BS 7971 standardization. All motors used should be DC brushless motors with essential isolation from mains.
•	Door should be with vision window 1.2 m X 0.8 m with double glazed panels and hermetically sealed motorized roller blind inside.
•	Noise level should not exceed 60 db
•	The starting time after receiving the signal should be adjustable between 0.5 to 20 seconds.
•	Speed of closing movement: 20 – 120 mm/Sec.
•	Slow Speed: 20 – 220 mm/sec
•	Opening Speed: Approx. equal to 800 mm/sec.
•	Closing Speed: Approx. equal to 500 mm / Sec
•	Door should provide X ray protection as per AERB regulation(Lead equivalent at 100 kV is 0.27mm)
•	The complete door assembly should be CE/ ICMED9001/ ICMED13485 or equivalent marked.
•	Test certificate for hermetic sealing with door frame (factory test certificate) should be enclosed with the pre dispatch documents to be forwarded.

6.	**Single Flap Swing Door:**
•	Single Leaf GI powdered coated hinge door of size 900 X 2100 having wall frame with rubber seals, Single door leaf, Door Handles, Door Closer and Hinges
7.	**Control Panel:**
•	The Touch Screen Control Panel should be 21" or more medical grade color TFT/LED panel. It should be flush mounted and sealed into theatre wall by means of a sterile jointing system. This control panel should work as the central control panel for the surgical devices and theatre devices (lights, instruction board, communication interfaces- both audio and video etc).
•	The panel should accommodate all necessary controls for the correct operation and monitoring of the equipment and services within the operating room (OT).
•	The touch screen should be spring arm mounted, stationed in the visibility line of the surgeon, ideally boom-mounted to carry all communicating cables. The access height should be convenient for the nurse to operate and help/assistant when in need.
•	The Digital clock and the elapsed time indicator:
•	The Medical gas alarm should indicate high and low gas pressures for each gas service present in the OR including vacuum. This should be supported by audible alarm also. The panel should have an alarm mute (fault annunciation) facility. The sensors (pressure switches) should be at the nearest isolation valve.
•	Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.
•	Control of the operating light (major and satellite and camera control (on/off and intensity control) should be provided.
•	Hand free telephone set with memory should be located at one side.
•	Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel)
•	Digital room pressure indicator in cm of H_2O or equivalent (signal from pressure sensor)
•	HEPA filter bank differential pressure indicator desirable.
•	Music control with (MP3 or equivalent player) and selection facility - desirable. (either individual OT or through central music system for the complex from the control room)
8.	**Distribution Box**
•	All high voltage equipment should be installed in a separate enclosure.
•	The remote cabinet should house the operating lamp transformers, mains failure relays, UPS, electrical distribution equipment & circuit protection equipment for all circuits within the operating theatre.
•	All internal wiring should terminate in connectors with screw & clamp spring
•	Connections of the clip- on type mounted, on a CE/ / ICMED9001/ ICMED13485 approved rail & labeled with indelible proprietary labels.
•	Individual fuses or miniature circuit breakers should protect all internal circuits.
•	Complete schematic drawing with description should be enclosed with the equipment.
9.	**X-Ray View Screens:**
•	LED type flat panel X-ray viewing panel should be supplied.
•	This should comply with relevant electrical safely codes.
•	This should be a 3 panel viewing screen.
•	Mounting should be flush with the wall to avoid dust accumulation and growth or organisms between wall and panel.
•	Body should be of extruded aluminum powder coated black with bacteria and disinfectant resistant finish.
•	The diffuser on the front panel should be a uniformly lit screen.
•	Dimming electronic control should be enclosed at the bottom of the cabinet.
•	Proper spring loaded film clip with rollers should be provided to holes the films firmly and to remove the film without scratches.
•	Each panel should be able to illuminate films up to 14"x17" size. (Total 3 Panels)
10.	**Pressure Relief Dampers:**
•	Pressure relief dampers should be provided in each room to prevent contamination of air from clean and dirty areas.
•	Suitably sized air pressure relief damper should be strategically placed, enabling differential room pressure to be maintained and ensure that when doors are opened between clean and dirty areas.
•	Counter- weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room.
•	Air pressure stabilizers should have unique capability of controlling differential pressure to close tolerance. The PRD should remain closed at pressure below the set pressure and should open fully at a pressure only fractionally above the threshold pressure.
•	The body should be epoxy powder coated as per standard BS colors. High grade electrolyzed steel plate should

be used for body and high grade SS 304 stainless steel for blades
11. Peripheral Lights with Dimming Control: **LED Lights Should be with Dimming Control preferably**
• Peripheral lights and clean room luminaries fitted in the CG frame should be 8 in numbers for each OR. High quality imported surface mounted and recessed luminaries should be with at least 3Nos of 54W fluorescent lamps (TS or equivalent). Should be with highly specular anodized aluminum reflectors and optical antiglare system for individually adjustable light distribution.
• Luminaries cover should be made of highly resistant, disinfectant proof laminated safety glass with stylish fine grained surface, glass pane with white coated steel frame.
• The reflectors should be of high quality, cleanable and non deteriorating.
• The white luminaries body should be made of sheet steel/ perfectly powder coated, supplied ready for connection optionally for individual or series circuit with digital electronic control gear in multilamp technology.
• This should be with adjustable multilamp ballast with interface 1-10V, controllable from the panel. Should be suitable for extruded aluminium areas where infrared remote controls are in use.
• Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable form top or bottom. The light fitting should be uniformly and esthetically distributed on the ceiling to provide uniform illumination in the OR. Light should not interfere when green mode endoscopy is performed
• Peripheral lighting should be done according to IP65 (international protection rating 65)
• Control equipment for the general lighting and the light dimming should be provided in the theatre control panel
12. Storage Unit:
• 1 mm stainless steel panels grinded or antibacterial powder coated with or without ventilation holes in housing. Shelves should be made of stainless-steel plates.
• It should be continuously ventilated by positive air in the room through ventilation holes provided at the bottom and top of opposite sides.
• The shelves should be of welded SS mesh of size 3 mm and grid size 30 mm X 30 mm removable for cleaning.
• The storage unit should be divided 2 or more parts and each part should have individual glass doors with high quality locking system
• The overall size should be approximately 180 cm X 60 cm X45 cm
13. Write List Board:
• A list/Writing Board is provided in each operating theatre.
• The writing unit comprises a flush mounted, 1.50mm thick, white laminate board, bonded to a 40mm high density fiberboard sheet for additional rigidity.
• The unit can be opened to create a wall mounted writing surface within the operating room.
• An additional storage unit is located under the writing unit for the placement of a computer CPU and peripheral items.
• The white board is constructed from 1.6mm thick, white laminate board.
14. Hatch Box:
• A Hatch should be provided in each operation theater to remove waste materials from the operation theater to dirty linen area/corridor just adjacent to Operation Theater.
• Each Hatch box should be equipped with two doors and the door should be operated electronically.
• The Hatch should be designed in such a way that only one door should be opened at one time.
• The UV light should be so installed that it is kept on while both the doors are closed. This UV light has to be automatically turned off in case of opening of either of the doors
• Indicators should be provided on both sides of the OT so that door open / close status can be monitored from both sides.
15. Surgical Scrub Station – Two Bay
• Compact surgical scrub sink should be designed for use in OT complex providing for pre – OT scrub up.(Double sink)
• Each fixture should be fabricated from heavy gauge type 304 stainless steel and should be seamless welded construction, polished to a satin finish.
• The scrub sink should be provided with a front access panel which should be easily removed for access to the water controlled value, waste connections, stoppers and strainers.
• Hands free operation should include infra red sensors with built-in range of adjustment.
• Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature.
• User defined setting of 1 to 3 should be available. This timing should be adjustable to meet individual application requirements.
• Provided with infrared sensors, thermostatic control taps with fail safe temperature controls.

• All units should have reduced anti- splash fronts.			
• Knee operated switch should be there.			
16. LED OT LIGHT WITH HD CAMERA SYSTEM:			
Description: Dual Dome LED Surgical Lighting System with one dedicated Spring-Arm Suspension for Progressive Scan HD Flat Panel with an Integrated In-Light Camera System.			
OT Light			
Operating Room Surgical Lighting System should provide an ideal combination of brightness, maneuverability, and shadow resolution without sacrificing color accuracy through a consistent LED technology with a unique faceted reflector design technology.			
Number of Light heads	:	Two per suspension	
Number of LEDs	:	Mention the no of LED Lamp	
Color Temperature	:	3000 to 5500K	
Field Size Diameter Depth	:	5 inch – 10 inch	
Depth of Field	:	30 – 35 inch	
Illumination Level	:	minimum 160,000 Lux each	
Controls	:	Wall Control Touch Panel	
Rotation	:	360 degrees	
Vertical Adjustment Range	:	+ 20 inch – 25 inch	
Sterilizable Handle	:	Yes	
Lighthead Diameter	:	20 – 30 inch	
Mounting Type	:	Ceiling	
Supply Voltage	:	230 VAC 50 Hz	
Bulb Type	:	LED	
Dimming Range	:	30% - 100%	
Operating/Storage Humidity	:	10 – 95%	
Life of Light Source	:	> 30,000 Hrs.	
Camera System :			
Description: HD Wireless Camera system should be integrated at the Centre of one of the domes of this lighting system in order to capture images & video sequences of the open cases.			
Such a camera should have the following specifications:			
Signal to Noise Ratio (S/N Ratio)	:	<50 dB.	
Minimum Illumination	:	<3 lx	
Optical Zoom	:	10x	
Digital Zoom	:	12-15X	
Power Supply	:	Through Light / max. 12W.	
Relative Humidity	:	<90%.	
Video Output	:	S-Video & Composite Video	
White Balance & Gain	:	Automatic/Manual	
Such Surgical Light System Should be compliant with relevant European (CE) / US FDA standards/ ICMED9001/ ICMED13485.			
Such Light and Integrated Camera should have a control through Touch Panel of the control equipment placed inside the operating room at documentation station / nurse works station.			
17. Flat Panel Monitor			
Should have system with 24" High Definition Progressive Scan Flat-panel Monitors with ceiling mounted spring arm suspension to support high-definition/HDTV progressive Scan images and should be able to support and display DVI/HDTV, RGBHV, S-Video, Composite video signals.			
The flat Panel suspension should be ready with the cables for integration of High Definition Digital (DVI/HDTV), RGBHV (High Resolution), SVHS (S-Video), Composite video signals to travel from the various sources of video like endoscopic camera, room camera, in light camera, high definition flat panel monitors, while assuring native resolution / signal.			
Such Monitor (Medical Grade) should at least meet the following technical criteria:			
Resolution	: 1600 dots x 1200 dots, Progressive Scan		
Display Colors	: 16 Million Colors		
Inputs	: DVI, RGBHV, S-Video, Composite Video		
Synchronization	: 2.5 – 5.0 Vpp separated sync		
Response time	: <25ms		
Travel	: 330° - 340°		
Forward Tilt	: 30° - 40°		
Backward Tilt	: 45° - 50°		
Cable Kit for Integration	: DVI, Fiber Optic, RGBHV, S-Video, Composite		

18.	**Single Arm Anesthesia Pendant:**
1.	**Installation base**
	Single installation base for swivel arms
2.	**Suspension arm**
a.	The single arm designed with motorized height adjustable should be 1000 mm
b.	The vertical movement of the motorized arm should be at least 700 mm
c.	The load capabilities of each pendant should be at least 180 kg
d.	The allowable rotation angle of each axis should not be less than 340 degrees.
e.	Dual break system for maximum safety combines the advantages of both pneumatic and friction brakes.The upper and intermediate joint should be equipped with electro-pneumatic break to prevent unintentional movement or disconnection
f.	In the event of a compressed air system failure, pneumatic break system should hold position until the user chooses to release it. At this point, the friction brake takes over, allowing quick but controlled drift-free repositioning of equipment as required.
3.	**Supply distribution**
a.	The allowable rotation angle of each axis should not be less than 340 degrees
b.	800 mm column distribution for the gas and electrical outlet
c.	Separated cavity design for the gas (2 cavities on both sides) and electrical outlet (1 cavity in the middle) for maximum safety
d.	Supply distribution should consist of, but not limited to the following outlets:
i.	Vacuum outlet x 2 No. (BS Standard)
ii.	Medical air outlet x 2 No. (BS Standard)
iii.	Oxygen outlet x 2 No. (BS Standard)
iv.	Nitrous Oxide outlet x 2 No. (BS Standard)
v.	Electrical outlet (Indian Standard) x 8 Nos.
vi.	RJ45 x 1 No.
4.	**Accessories**
	Supply distribution should consist of, but not limited to the following accessories:
a.	Shelf (with side rail), load capacity 80 Kg – 450 mm (W) x 500 mm (D) x 2 No
b.	Infusion pole in length 1000 mm, height adjustable x 1 No.
c.	Extension arm 300 mm for the infusion pole x 1 No.
d.	Handle with control button for motor and pneumatic break
5.	**Certification**
	Should be European CE / US FDA / ICMED9001/ ICMED13485 Certified.
6.	Pendant should have eight 5A/15A combined electrical socket. Electrical socket should be of reputed make.
19.	**Double Arm Surgeon Pendant:**
	Installation base
	Single installation base for swivel arms
	Suspension arm
a.	The single arm designed with motorized height adjustable should be 1000 mm
b.	The vertical movement of the motorized arm should be at least 700 mm
c.	The load capabilities of each pendant should be at least 180 kg
d.	The allowable rotation angle of each axis should not be less than 340 degrees.
e.	Dual break system for maximum safety combines the advantages of both pneumatic and friction brakes.The upper and intermediate joint should be equipped with electro-pneumatic break to prevent unintentional movement or disconnection
f.	In the event of a compressed air system failure, pneumatic break system should hold position until the user chooses to release it. At this point, the friction brake takes over, allowing quick but controlled drift-free repositioning of equipment as required.
	Supply distribution
a.	The allowable rotation angle of each axis should not be less than 340 degrees
b.	800 mm column distribution for the gas and electrical outlet
c.	Separated cavity design for the gas (2 cavities on both sides) and electrical outlet (1 cavity in the middle) for maximum safety
d.	Supply distribution should consist of, but not limited to the following outlets:
i.	Vacuum outlet x 2 No. (BS Standard)
ii.	Medical air outlet x 2 No. (BS Standard)
iii.	Oxygen outlet x 2 No. (BS Standard)
iv.	Nitrous Oxide outlet x 2 No. (BS Standard)
v.	Electrical outlet (Indian Standard) x 8 Nos.

vi. RJ45 x 1 No.
Accessories
Supply distribution should consist of, but not limited to the following accessories:
a. Shelf (with side rail), load capacity 80 Kg – 450 mm (W) x 500 mm (D) x 2 No
b. Infusion pole in length 1000 mm, height adjustable x 1 No.
c. Extension arm 300 mm for the infusion pole x 1 No.
d. Handle with control button for motor and pneumatic break
Certification
Should be European CE / US FDA/ ICMED9001/ ICMED13485 Certified.
20. Medical Gas Pipeline System:
• The bidder should ensure that all works carried out are to the recommendation made in the Department of Health and Social Security's Health Technical Memorandum number 2022 (HTM 2022) & C11 and any other appropriate British Standards.
• Bidder should provide Oxygen, Air, Vacuum and Nitrous Oxide supply to Operation Theatres from the existing manifold.
• Bidder shall be responsible for installation and commissioning of Area Zone Service Unit, Warning and Alarm Unit and Terminal Unit etc.
• The line valve should be brass 25 mm ball valve with PTPE sealthes/seats operated by a quarter turn handle with a pin to prevent over travel in both directions. The ball valve shall be connected by HTM 2022 & C11 stub pipes to the distribution system by either top, bottom, side or rear entry pipes.
• The assembly should be housed in a valve box which shall be capable of both surface or concealed mounting incorporate a hinged lid which opens through 180 degree, to provide maximum access. The hinged door shall be fitted with a glass panel to enable a visual check on the line valve selected position and for access in an emergency.
• The hinged door should normally be locked closed and area zone valves installed adjacent to each other shall be operated by different key lock combinations.
• Terminal units should be gas specific and only accept the correct Medical gas probe. Gas specific components shall be pin indexed to ensure that a correct gas specific assembly is accepted.
• Terminal units should be designed to allow easy, accurate and low cost installation, providing a variable angle for pipeline inlet and to accommodate variable plaster depth up to maximum of 16 mm.
• Terminal units should incorporate a replaceable capsule assembly, enabling all working parts subject to wear through usage to be replaced as a factory assembled unit thereby reducing maintenance time.
• Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as detailed below as in HTM 2022 & C11. These markings shall be permanent and be an integral part of the terminal unit.
• The medical gas alarm system shall be an advanced/ multiplexing data transmission system which fully satisfies the principles of HTM 2022 and conforms in all respects to the National Health Service Model Engineering Specification C11
• Pipe work materials shall be manufactured by a licensee of the Bs 5750 quality assurance certification scheme and all pipes and fittings are marked with the BSI kitemark
• Pipes should be phosphorous de-oxidised non-arsenical copper to BS 6017 grade
• C106. Pipe sizes and manufacture should be according half hard to BS 2671 part 1
• Table x In addition to the marking requirements of BS 2871 pipes should be marked
• DEG to represent compliance with Medical degreasing specification.
• Fittings should be phosphorous de-oxidised non-arsenical copper to BS 6017 grade C 106, of sizes and manufacture to BS 864 part 2 or equivalent
• Copper to copper joints made on-site, utilize a copper phosphorous brazing alloy type CP1 or CP4 to BS 1845 and an inert gas shield and no flux.
• Copper to brass or gunmetal joints made off site shall utilise a silver breezing material type AG18 to BS 1845 with a flux and the joint is subsequently cleared and degreased for oxygen services
• Bidder should mention price for Medical Gas line installation separately with detailed BOQ.
21. Isolation Power Transformer System:
• Isolation Transformer is to be installed to cater total power load of the O.T.
22. Electrical System:
• Power distribution within "the departments should be "provided' from distribution boards located local to each theatre. Sub mains power to these panels should be by the general electrical contractor. From these panels all distribution services within the departments should be run. Complete schematics should be supplied along with the offer.
• Earthed equipotent bonding of all exposed metalwork should be provided.

- Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.
- Light fittings within the clinical areas should be recessed fluorescent type, with high frequency tubes and control gear.
- Fittings should be sealed In accordance with the standard IP54.
- All equipment should be fully and permanently labelled to identify and describe the function, operation and voltage of the apparatus concerned. Throughout and upon completion of the electrical installation, tests in accordance with relevant sections of the local wiring regulations should be carried out and the results recorded.

FIRE EXTINGUISHERS

Bidder should provide suitable fire fighting mechanism as per international standards Bidder should provide suitable fire extinguishers.

On line UPS 10 KVA with Battery Back Up of 1 Hour:

The UPS shall be a solid-state single phase UPS system designed to provide regulated and conditioned sinusoidal power to both linear and non-linear type loads. The UPS shall provide uninterruptible power during all modes of operation. There shall be no interruption of power to the critical load when the UPS transfers to and from battery operation. POWER CONNECTIONS: The UPS shall be hard wired input and output.

23. HVAC System for Modular OT

1. AHU - AIR HANDLING UNIT (DOUBLE SKIN TYPE).

1.a Type:

The air-handling units are of double skin construction, draw-thru type comprising of various sections such as Pre-filter section, coil section. Units must be able to work satisfactorily in exposed atmospheric conditions. The unit should have tubular heater of 3 KW range with SS Jacket construction.

1.b Casing:

Double skinned panels are fabricated with anodized extruded aluminimum extrusion frame work bolted together with sandwich panel having powder coated 0.70mm sheet for outer skin and plain GP 0.63 mm sheet for inner skin. 43 mm thick PUF insulation material is injected between the two panels (with U valve no greater than 0. 85W / m^2 / K)

The entire frame duly painted is mounted on sheet steel channel based. The panels are sealed to the framework by heavy-duty 'O' ring gaskets held captive in the framed extrusion. All panels are detachable or hinged. Hinges are made of die cast aluminium with stainless steel pivots, handles are made of hard nylon and be operational from both inside and outside of the unit. All fixing and gaskets shall be concealed.

1.c Motor and drive:

Fan motors are highly efficient and work on 440 ± 10% volts, 50 cycles, three phase with explosion proof type with class F installation, with IP 55 protection. Motors are easily designed for quiet operation and motor speed does not exceed 1440 rpm. Drive to fan is provided through belt-drive arrangement. Belts are of the oil-resistant type.

1.d Fan:

Fans are of centrifugal type, conforming to AMCA 210 and are double width, double inlet with forward-inclined airfoil blades, specially designed and suitable for the required operating pressure. Fan casing are made from galvanized steel sheet. Fan shaft is grounded C 40 carbon steel and supported in self-aligning plumber block operating less than 75% of first critical speed, grease lubricated bearings.

1.e Cooling Units:

DX coils have 12.5 to 15mm dia tubes minimum 24G thick with sine wave aluminimum fins firmly bonded to copper tubes assembed in zinc coated steel frame.Face and surfaces areas are such as to ensure rated capacity from each unit and such that the air velocity across the coil does not exceed 150 meters per minutes. Each coil is factory tested at 21-kg/M^2 air pressures under water. Tube is Hydraulically / mechanically expanded for minimum thermal contact resistant with fins. Fin spacing is 4-5 fins per cm.

1.f Filters:

Each unit is provided with a factory assembled section containing washable synthetic type air filters having anodized aluminium frame. The media is supported with HDP mesh. Filter banska are easily accessible and designed for easy with drawl and renewal of filter cells. Filter banks face velocities do not exceed 100 m/minutes. Differential pressure switch is to be fixed across the filter as part of AHU's system.

2. Ducting:

The duct supply system should be free of construction debris. Ducting shall be made of Aluminium with curves & bends where indicated for easy flow of and ensured to be air tight by applying silicon sealant after fabrication. Hangers shall be provided to ducts & shall be suspended by means of G.I. coated rods & these shall not be more than 2.5mtrs apart. Thermal insulation with 9mm XPE for supply & return air ducts. Joints will be lapped with Nitrile rubber tape for better insulation.

3. CONDENSING UNITS

3.a Compressor:

The compressor shall be screw, scroll / reciprocating type, hermitic, in accordance with ARI 520, direct

	driven with capacity control arrangement. The compressor casing shall be of cast iron and designed for 450 psig or higher. The compressor shall incorporate rolling element bearing to support rotating assembly. the rotor shall be higher steel alloy.
	Refrigerant circuit components shall include flexible pipe connectors, hot gas muffler, high side pressure switch, liquid line shut-off valves, suction and discharge shut-off valves, filter drier, moisture - indicating sight glass, electronic or thermostatic expansion valve (EXV), heavy duty pressure gauge with cocks to monitor suction, discharge and oil pressure and complete operating of refrigerant and compressor oil.
3.b	**Motor:**
	Compressor motor shall be Hermetic / semi-hermetic direct drive, squirrel cage, two pole, induction type, refrigerant cooled motor suitable for 415 V/50Hz. 3 Phase supply. Hot gas motor cooling is not acceptable.
3.c	**Condenser:**
	Condenser shall be Air Cooled type. Tubing shall be copper, Aluminium fins high efficiency type. Tubes shall be nominal 19mm. Outer diameter and thickness shall not be less than 22 g. and rolled into rube sheets and shall be individually replaceable and also tubes shall be coated with corrosion resistant coating.
	Condenser fans shall be direct coupled to motor and protected against overloading and with minimum 1.15 service factor.
4.	Suitable Servo Voltage Stabilizer / Automatic Voltage Stablilizer of required capacity is to be provided capable to take entire load of HVAC Syste.
24.	**ULTRA VIOLET LIGHTS**
•	30 watts Philips or equivalent UV tube lights fixed to the frame with reflector.
•	SS frames shall be made of .8mm SS 304, recess mounting type with hour meter.
•	The unit shall be easy to disinfect and maintain.
25.	**TOUCH SCREEN MONITORS WITH DESKTOP**
•	One 24" (approx.) medical grade Touch Screen shall be mounted on a Monitor Arm supplied with the O.T. Lights and shall be located within the sterile field for the doctor's control or his assistant. This monitor must be Full HD "Widescreen" with resolution of approx. 1920 x 1920.
•	One 24" (approx.) medical grade Touch Screen Desktop Mountable shall be located on the Nurse works Station outside the sterile zone for the technician / sister. Higher configuration Desk Top is to be provided.
•	Both the Touch Screens should be able to mimic the actual device panel by displaying an identical image of the device panel. This is necessary for the ease of control and to ensure that anybody familiar with the key functions on the devices will also be able to operate the device by using the touch screen.
	Documentation and Data Management:
	Image capturing, video recording and data archiving of any procedures should be made available and controlled via the Touch Screen mounted on the monitor arm and simultaneously from the desktop (higher configuration) mounted on Touch Screen located in the nurse workstation positioned outside the sterile field.
	The documentation system should have pre-setting to facilitate a more rapid data entry with the following features :-
•	Automatic creation of standard reports.
•	Digital storage and advanced editing of still images, video sequences and audio files.
•	Digital alternative to video printer, video recorder and dictating machine.
•	Sterile, ergonomic operation via touch screen, camera head buttons and / or footswitch.
•	Network storage should be possible.
26.	**Anesthetic Gas Scavenging Disposal System (AGSS)**
•	Anesthetic Gas Scavenging System (AGSS) plants are to be installed to provide a safer working environment for the medical personnel by the removal of the waste gases that are produced during anesthesia and from the surrounding environment.
•	AGSS plants are to be installed as simplex or duplex units comprising of die cast aluminum side channel blowers complete with electrical controls, pressure sensor, relief valve and drain flask, all pre-piped, pre-wired and factory tested. The duplex plant control panel should incorporates a duty pump selector, vacuum gauge and indicators to identify the plant status. The standby pump is to be activated automatically upon high demand or the failure of the duty pump. Duplex units should incorporate non-return valves to enable the maintenance of one pump whilst the other pump is in service. Pumps are available to suit single phase or three phase electrical suppliers. Remote switches are available to enable control of the AGSS plant from within the department served and to indicate the status of the plant.
Improtant Note:	
1.	Interested Bidders may inspect the proposed hospital buildings before submission of their proposal to decide requirement at their own cost.
2.	Before submitting the proposal, the bidder will be deemed to have satisfied themselves by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates quoted in the proposal are adequate and all inclusive to accord with the provisions of contract for the completion of works to the entire satisfaction of the IGIMS, Patna.

2: OT Light

Specification :	Specification Name :	Bid Requirement (Allowed Values) :
Performance Parameters	Type of Ceiling OT Light	Double Dome
	Technology of Light Emission of OT Light	LED Technology
	Diameter of lamp Head for main dom in mm with tolerance ±20 mm	600
	Diameter of Auxiliary dom in mm with tolerance ±20 mm	600
	Diameter of lamp Head for Second auxiliary dom in mm with tolerance ±20 mm	NA in case of Single dom and Double dom
	Material of Head Lamp	ABS
	Range of Light Intensity in Luminous at 1 meter distance	160000 + 160000 (For auxiliary dom)
	Range of Colour Temperature in Kelvin	3800-5000
	Life Span of LED in hours	60000
	Range of Illuminated field diameter in mm	150-400
	Colour rendering index (CRI)	98
	Type of Control Panel	Manual and Touch Screen
	Battery backup	30 mins
	Warranty (Option of comprehensive warranty is available through bidding only, which if opted will supersede normal warranty in the catalogue)	1
Reports	Availability of test report from central govt/ NABL/ILAC accredited lab covering all parameters	No
	Copies of certifications and test reports (if test report is indicated as Yes) to be provided to buyer on demand at time of supplies	Yes
Comprehensive Maintenance	Warranty of required product	5 Year
	Comprehensive Maintenance Duration (Post Warranty)	5 Year
Delivery Days		90 Days
Additional Specification Parameters	**A. Detail Additional Specification Parameters will supersede the above specification For OT light**	
	1. Number of Light Heads	2
	2. Number of LED's per dome	92 or more
	3. Multicolour LED's	Yes
	4. Shadow free Illumination	Yes
	5. Diameter of light head (cm/inch)	≥70 cm
	6. Lux Intensity of each dome	1,60,000 Lux
	7. Field diameter (cm/inch)	14-35 cm
	8. Types of Light Beams	Circular & Oval
	9. Colour Rendering Index (CRI)	≥98
	10. Colour temperature (K) -steps	3000K- 5500K seamlessly /continuously adjustable
	11. Life Span of LED Lamps	60000 hours
	12. Camera built in / upgradeable and type of camera	Full HD wireless
	13. Video recording option through camera	Must be from same OEM with touch control panel for better integration and zero lag time for image transmission
	14. Adjustable light field intensity & size	Must be Available
	15. Input power requirement	100-240 VAC
	16. Power consumption	Maximum 130 -150Watts
	17. Total weight with each dome	Less Than 15 Kg
	18. Protection Class	I
	19. Degree of protection -Light heads	IP 55 or better
	20. Compatibility with Laminar Air flow	Yes
	21. Rotation of light heads -deg	360 degree
	22. Sterilizable handle	Yes

	23. Mounting Type	Ceiling
	24. Dimming Range/ Illluminance Adjustment	>30% to 100%
	25. Backlite Background light for Endoscopy procedures	1 % to 30%
	26. Type of Control Panel	Touch panel
	27. Data Exchange Technology through	Latest Bluetooth/Wireless
	28. Design	Must be designed for low ceiling height (If required bidder can take the measurement of actual site of installation)
	29. LED light cover	Scratch resistant tampered glass
	B. Detail Additional Specification Parameters will supersede the above specification for Inbuilt HD wireless camera	
	1. Camera Placement	Centre of Light Dome
	2. Detachable &Reattachable feature	Yes
	3. Aspect ratio	16:09
	4. Zoom	10x optical / 12x digital
	5. Image Resolution	1920 x 1080p
	6. Effective Pixel number	> 2 millions
	7. Signal to noise ratio	50 db
	8. Live Transmission Feature	Available
	9. Focal Length Zoom Lens	3.8 mm (wide angle)- 38 mm (tele)
	10. Aperture	1.8 F -3.4 F
	11. Shutter Speed	1 to 1/ 10,000 s
	12. White Balance	Automatic/ sync/custom
	13. Video Signal	2x HDMI at the receiver unit
	14. Image Sensor	1/2.8 type, "Exmor" CMOS Sensor
	15. Image Frequency	60 Hz
	C. Detail Additional Specification Parameters will supersede the above specification for Inbuilt Medical grade recorder & monitor	
	Medical HD VIDEO RECORDER for OT LIGHT	
	1. It Should be portable standalone medical video recorder, mountable anywhere in the Operation Theatre on Pendant , trolley , Table etc.	
	2. It should be Handy and easily detachable so that it can be shifted any other operation Theatre for recording .	
	3. All necessary video cabling should be provided and routed to record the video from OT Light Camera System.	
	4. It should be compatible with wireless Camera system on the OT Light . It should be mountable along with wireless Camera Receiver unit .	
	5. Both video and still image to be recorded Recording format - Videos: H.264 / MPEG4 Images: JPG, TIFF, BMP, DICOM Video Resolution - High Definition: 1080p, 1080i, 720p Recording Resolutions 1920x1080, 1280x1024, 1280x720, 1024x768, 800x600, 640x480	
	6. Video Connections Input: DVI (RGB/YPbPr via adapter), HD SDI, S-Video, Composite,HDMI Output: DVI ,HDMI	
	7. It should have mini inbuilt Display to show the recording /recorded video	
	8. Recording capacity - Internal Hard disk , minimum 1TB	
	9. It should have facility to connect external hard disk, USB drive to record and copy videos	
	10. It should have option to enter complete patient details	
	11. It should have option to connect Key board to enter Patient details	
	12. It should have option to connect to the Hospital network and record the data to network storage and access the data through Hospital network	
	13. It should have 3 USB PORTS, option to connect medical colour printers it should have connect footswitch/remote to control the recording start /stop	
	14. it should Conforms to Medical Devices Directive 93/42/EEC,with respect to electrical shock, fire and mechanical hazards only in accordance with IEC 60601-1:2005, ANSI/AAMI ES60601-1:2005, CAN/CSA C22.2 No.60601-1:2008, E361228, PSE, GOST-R,BIS or equivalent safety standards	

	15. Electrical Requirement -Direct 220V AC supply

3: Laparoscopic Instruments

Instruments :	**Qty :**
Reusable Veress 10 & 13 cm Pneumoperitoneum Needle:-Spring loaded blunt stylet luer lock length 10 / 15 cm.	3 No.
Reusable Trocar : 5 mm.:-Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	4 No.
Reusable Trocar : 10 / 11mm :-Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	4 No.
Reusable Trocar : 12 mm:-Multifunctional valve, insufflation stopcock and threaded sleeves, pyramidal tip, length (10.5 cm).	3 No.
Safety Trocar with Port.:-10 mm length approx 10.5 mm.	4 No.
Spare Sealing Trocar Caps for Trocar. :-5 – 6 mm.	4 No.
Spare Sealing Trocar Caps for Trocar. :-10 – 11 mm.	10 No.
Reusable Reducer Sleeve. :-10 / 11 mm to 5 / 4 mm.	10 No.
Reusable Reducer Sleeve.:-12 mm to 6 / 5 mm.	5 No.
Suction and Irrigation Cannula. :-Size 5 mm, length 36 cm, used with suction and irrigation handle.	5 No.
Grasping Forceps – Toothed 2 x 4 Teeth.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
Grasping Forceps – Toothed 2 x 3 Teeth. :-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
Maryland Forceps.:-Double action jaws , rotating with connector pin for unipolar coagulation, size 5mm, length 33-36cm, dismantling facility.	4 No.
Grasping Forceps – Atraumatic. :-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
Grasping Forceps – Allis.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility	2 No.
Grasping Forceps – Rt Angled.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility**.**	2 No.
Grasping Forceps – Mixter.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
Grasping Forceps – Plain Dissection & Grasping.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling	4 No.
Grasping Forceps – Babcock.Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	2 No.
Fan Shaped Retractor.:-Rotating, size 5 mm, length 33 -36 cm, dismantling facility.	2 No.
Nathanson Liver Retractor.:-Set of four sizes (45, 55, 78, 95 mm), sandblasted to eliminate light reflectionwith table attachment for holding the retractor & camera arm.	1 No.
Hook Scissors.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	6 No.
Micro Scissors.:-Single / Double action jaws, size 5 mm, length 33 – 36 cm.	4 No.
Laparoscopic Knife.:-5 mm, 30 – 36 cm length.	2 No.
Rotating Metzenbaum Scissors.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	4 No.
Bipolar Coagulating Forceps.:-Size 5 mm, length 33 – 36 cm fenestrated.	2 No.
Bipolar Coagulating Forceps.:-Size 5 mm, length 36 cm, 3 mm width of jaws.	2 No.
Maryland Bipolar.:-Double action jaws, rotating with connector pin for bipolar coagulation, size 5 mm, length 33 – 36 cm, dismantling facility.	3 No.
CO2 Connector.:-Compatible with CO2 “B” type cylinder.	2 No.
High Frequency Cord.:-For 5 mm & 10 mm hand instruments with monopolar electrodes, spatula tip.	2 No.
High Frequency Cord:-For 5 mm & 10 mm hand instruments with monopolar electrodes, hook tip.	2 No.
Knot Pushers.:-Eye type, length 33 – 36 cm.	2 No.
Needle Holder Coaxial Type.:-Size 5 mm, tungsten tip, straight handle with ratchet, single moving jaw, length 33 – 36 cm.	2 No.
Assistant Needle Holder.:-Size 5 mm, tungsten tip, straight handle with ratchet, single moving jaw, length 33 – 36 cm**.**	2 No.

Clip Applicator – Medium Large.:-Rotatable, provision for locking the shaft conveniently, 10 mm, compatible with clip	3 No.
Trocar under optical vision:-Trocar with endo tip size: 10mm & 5 mm, cannula rotatable with multifunction valve, working length: 11cm. The endo tip cannula should compatible with 10mm telescope for under vision entry into peritoneum.	3 No.
Grasping Forceps – Toothed 2x 3 Teeth.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 10 mm, length 33 – 36 cm, dismantling facility	3 No.
Grasping Forceps – Toothed 2x4 Teeth.:-Double action jaws, rotating with connector pin for unipolar coagulation, size 10 mm, length 33 – 36 cm, dismantling facility.	3 No.
Suction Irrigation Cannula.:-10mm	2 No.
Stone Extractor.:-10 mm single / double action Jaws.	2No.
Hassan Cone.:-Adaptable to 10 mm trocar.	2No.
Bowel Grasper.:-10 mm fenestrated, rotatable.	2 No.
Blunt Obturator. :-For 11 mm port.	2 No.
L – Hook.:-Size 5 mm, length 33 – 36 cm with pin for cautery. Well insulated hook with small un-insulated working part.	6 No.
Spatula.:-Size 5 mm, length 33 – 36 cm with pin for cautery.	2 No.
Fascia Closure Instrument:-Size 2.8 mm, length 17 cm.	3 No.
Washers:-For 5 & 10 mm cannula and reducers.	20 No.
Container : Metal & Plastic.:-For sterilization and storage of telescopes Different sizes.	2 No.
Container : Metal & Plastic.:-For sterilization and storage hand instruments and other accessories, Different sizes.	2 No.
SCISSORS INSERT WITH OUTER SHEATH, CURVED, DOUBLE ACTION JAWS, LENGTH OF BLADES 17 MM, SIZE 5 MM, LENGTH 36 CM, STERILE, FOR SINGLE USE, PACKAGE OF 10	1 set

4: Electro Surgical Unit

1. System should come with Micro- Processor technology with capacity of 300 watts and can be used for all Open & Laparoscopic surgeries including liver resection & liver transplantation with and bipolar modes available.
2. It should have capacity to monitor changes in tissue impedance by 4,34,000 times per second to produce clinical tissue effects and adjust the energy output accordingly .
3. It should come with Three- Section touch screen display for ease of use and should display error alerts also.
4. It should be compatable with three button cautery pencil to use advanced monopolar mode like cut/ coagulation with single button and independently also with cut & coagulation button and have a capacity to use lower power settings resulting in less char, less thermal spread and less arcing than a traditional monopolar coagulation mode.
5. It should have Auto Bipolar Mode to use Bipolar Energy without Bipolar Foot Switch.
6. It should have 3 different modes like Precise/ Standard/ Macro modes for Bipolar Energy Usage.
7. It should have Pure Cut / Blend Cut modes in Monopolar Cut energy.
8. It should have 5 modes like soft/ fulgurate/ shared fulgurate/ shared spray/ spray modes in Monopolar Coagulation energy.
9. It should come with internal memory of 8GB storage capacity to store events & errors
10. It should be with other devices, including:
a. Argon Plasma system
b. Smoke Evacuator
11. Unit should self-test during Power ON.
12. Unit should have Digital Wattage indications for Bipolar, Monopolar Cut and Coagulation.
13. Unit should have Two Monopolar out puts to use by two surgeons simultaneously.
14. Unit should have Audio Visual Patient Plate Error System.
15. Unit should have Split Type Patient Plate contact quality monitoring System for Maximum Patient Safety (Unit should not be delivering power until and unless maximum area of the patient plate is attached to patient body to minimize the risk of post-operative cautery burns).
16. Monopolar Coagulation should consist Spray for Non-Contact Coagulation.
17. Monopolar Coagulation should consist of Fulgurate mode for Monopolar Underwater Coagulation & Cutting to use for TURP procedures.
18. Unit should be compactable with three button monopolar pencil which can be used to adjust the power output of the machine from the sterile field itself.
19. Unit should have Facility to use monopolar and bipolar function without switchover.
20. Unit should have simultaneous coagulation facility in Monopolar coagulation.
21. Unit should have a facility to use auto bipolar mode by setting delay time of up to 2.5 second
22. Unit should have facility to enable Auto Bipolar & Ammeter as per the requirement.

23. The system should have current ammeter, to display the conductivity of the bipolar energy.
24. Should be able to use shared coagulation in monopolar mode and should have an option to enable and disable the shared coagulation facility also.
25 Should have an option to enable and disable auto bipolar as per the requirement from the surgeon.
26. There should be soft coagulation mode to do precise surgeries like Liver Resection & Liver Transplant.
27 It should have facility to use shared coagulation mode with two pencils of two buttons or one pencil of two buttons & one pencil of three.
28. System should be software Upgradable for future features usage.
29. Unit should have US FDA and European CE approved.
30. **Output Waveforms:**

Bipolar Mode

Precise- More than 400 kHz continuous sinusoid
Standard- More than 400 kHz continuous sinusoid
Macro - More than 400 kHz continuous sinusoid

31. **Monopolar Cut**

Pure Cut- More than 400 kHz continuous sinusoid
Blend- more than 400 kHz sinusoid bursts of sinusoid, recurring at 27.7kHz +/10% intervals.
50% Duty Cycle

32. **Monopolar Coag**

Soft - More than 400 kHz continuous sinusoid
Fulgurate - More than 400 kHz damped sinusoidal bursts with a repetition frequency of 27.7kHz +/-10% with 6.25% Duty cycle.
Shared Fulgurate - More than 400 kHz damped sinusoidal bursts with a repetition frequency of 27.7kHz +/-10% with 6.25% Duty cycle.
Spray- More than 400 kHz damped sinusoidal bursts with a repetition frequency of 21.1kHz +/- 10% with 4.76% Duty cycle.
Shared Spray- More than 400 kHz damped sinusoidal bursts with a repetition frequency of 2.1.1kHz +/-10% with 4.76% Duty cycle.

33. System should have standards of IEC 60601-1: 2012 for Leakage Currents & Patient Auxiliary Currents.
34. System should be Defibrillator proof with standards of (IEC 60601-1, IEC 60602-2 and ANSI HF18).
35. System should have safety standards for Liquid spillage/Ingress so that in normal usage it should not wet electrical insulation or other components, which when wetted are likely to adversely affect the safety of the equipment.
36. System should have standards of Voltage Transients- Energy Platform mains transfer (IEC 60601-1, IEC 60602-2 and ANSI/AAMI HF18) so that system continued to operate normally with no errors or system failures when transfer is made between line AC and an emergency system voltage source. The system may momentarily shut down in safe mode.

5: Open Laparoscopic Instruments

1. METZENBAUM SUPERCUT Dissecting Scissors, curved, 180mm (7"), wave cut, blunt/blunt- 05
2. METZENBAUM DUROTIP TC Dissecting Scissors, curved, 180mm (7"), delicate pattern, wave cut, blunt/blunt- 04
3. METZENBAUM DUROTIP TC Dissecting Scissors, curved, 230mm (9"), delicate pattern, blunt/blunt- 04
4. NELSON - METZENBAUM DUROTIP TC Dissecting Scissors, curved, 285mm (11 1/4"), delicate pattern, blunt/blunt- 04
5. BABCOCK Intestinal Grasping Forceps, straight, 155 mm (6 1/8")- 20
6. ALLIS Intestinal Grasping Forceps, straight, 155mm (6"), toothed (3x4)
7. ALLIS Intestinal Grasping Forceps, straight, 155mm (6 1/8"), toothed (4x5)
8. ALLIS Intestinal Grasping Forceps, straight, 190mm (7 1/2"), slender pattern, toothed (5x6)
9. ADSON Dressing Forceps (Tweezers), straight, 180mm (7"), delicate, serrated- 04
10. GILLIES Dressing Forceps (Tweezers), straight, 155mm (61/8"), delicate, serrated
11. CUSHING dressing forceps (Tweezers), straight, 200mm (7 7/8"), delicate, serrated
12. DEAVER Retractor, 310mm (12"), Fig, 4, Width: 50mm
13.MIKULICZ Abdominal Wall retractor, 255 (10"), depth:86mm, width:55mm, 14.BALFOUR Abdominal Retractor, complete retractor, 200mm (8"), width:170mm, opening
15.BALFOUR Abdominal Retractor, complete retractor, 200 mm (8"), width: 170 mm, opening width: 155 mm, consisting of BV611R-01
16.MOSQUITO (HARTMANN) Hemostatic Forceps straight, 100 mm (4"), delicate- 10
17.DEBAKEY ATRAUMATA Atraumatic Forceps, straight, 150 mm (6"), toothing DE BAKEY, width: -04
18.DEBAKEY ATRAUMATA Atraumatic Forceps, straight, 200 mm (77/8"), toothing DE BAKEY, width: -04
19.COOLEY ATRAUMATA Atraumatic Forceps, straight, 200 mm (77/8"), toothing COOLEY, width: 2 - 02
20.GILLIES Tissue Forceps, straight, 155 mm (61/8"), delicate, toothed (1x2).-04

21. KELLY Hemostatic Forceps, straight, 140 mm (51/2"), delicate, blunt, -20
22.KELLY Hemostatic Forceps, curved, 140 mm (51/2"), delicate, blunt,-20 23.MOYNIHAN Hemostatic Forceps, curved, 150 mm (6"), delicate, blunt,-20 24.LERICHE Hemostatic Forceps, straight, 150 mm (6"), delicate, blunt-06
25.LERICHE Hemostatic Forceps, curved, 150 mm (6"), delicate, toothed (1x2)-06
26.CRILE Hemostatic Forceps, curved, 160 mm (61/4"), delicate, blunt- 06
27.MIXTER (BABY) Dissecting Forceps, strongly curved, 180 mm (7") -03
28.MIXTER Dissecting a Ligature Forceps, angled right, 230 mm (9") -04

6: OT Table

Multi Purpose, Electric Powered OR Table, with Four-Five Sectioned Tabletop suitable for General, Ortho, Neuro Surgical Procedures.

The OR Table should be 100 % oil free
Tabletop Section should have longitudinal Slide (min. 270mm)
The OR Table should be Mobile modular operating table for patient weights up to 450 kg in standard height, with electro motorized adjustment of height, tilt, Trendelenburg/ anti-Trendelenburg, back and leg section joints.
The OR Table top should have full length radiolucent and do not have any metallic cross links enabling better imaging.
Base Column should be made of 100% Stainless Steel
Kidney bridge position should be achievable (0-12 cm)
Achieving ZERO level position by pressing single button from the handset or column keypad
OR Table should have a narrow base allowing optimum access and greater stability. Table should have offset slim line column, with SS inverted telescopic covers for superior imaging and access
The head section and leg section of OR Table should be interchangeable enabling different surgical procedures
The OR Table should be able to connect to Laptop directly/modem
The OR Table should run for 1 hour of continuous movements on battery without charging
Tabletop Mattress should be moulded. Antistatic with no seams to prevent ingress of Fluid and should be easy to fix and clean with mushroom like buttons enabling easy removing and better hygiene
The OR Table should have 4 double joint wheels of 150 mm which provides plenty of space for the surgeon's feet and should have free and directional run

Technical Details

Power supply external:	230V/ 115V, 50/60 Hz
Power supply internal:	2 accumulators (Lead gel), 12 V, 10Ah
Lift:	420 mm
Trendelenburg/ anti-Trendelenburg:	- 30°/ + 35°
Tilt:	± 25°
Zero position:	automatic
Length OR table top:	1.007 mm
Width over side rails:	582 mm
Height adjustment incl. table top:	700 mm – 1.120 mm
Joint leg section up / down:	± 90°
Joint upper back section up / down:	+ 90°/ - 55°
Joint lower back section up / down:	+ 80°/ - 40°
Longitudinal shift:	270 mm
Flex/ Reflex:	220°/ 140°
Net weight:	200 kg up to 215 kg
Maximum load:	450 kg

7: Body Composition Analyzer

1) General :

1.1 It should works under bioimpedance spectroscopy technology with an physiologic tissue model all in a small portable medical device
1.2 The system should be validated against gold standard references in both patients and healthy subjects
1.3 The system should be specially designed for patient with kidney failure and normal healthy individual, which should be capable of providing the following measurement with data and units:
1.3.1 Overhydration(OH) (Pre/Postdialytic)(L)
1.3.2 Lean Tissue Index (LTI)[Kg/m^2]
1.3.3 Fat Tissue Index (FTI)[Kg/m^2]
1.3.4 Total Body Water (TBW)[L]

1.3.5 Extracellular Water (ECW)[L]
1.3.6 Intracellular water (ICW)[L]
1.3.7 ECW / ICW
1.3.8 Lean Tissue Mass[Kg] &[L]
1.3.9 Fat Mass[Kg]
1.3.10 Adipose Tissue Mass[Kg] &[L]
1.3.11 Body Cell Mass[Kg]

1.4 The system should contain integrated patient card holder
1.5 The system need to measure for the pediatric patient with special dedicated electrodes.
1.6 The system need to be validated with Peritoneal dialysis patients.
1.7 The system need to store the results on the Individual Patient Card.
1.8 The system need to instruct the operator for abnormal movement of the patient
1.9 Data need to be transferred via Patient card to a personal computer for further analysis with the Fluid Management Tool(FMT)

2) **Fluid Management Tool (FMT) software:**
2.1 The system should display results relative to reference ranges of healthy individuals and dialysis patients
2.2 The system should need to show each patient's progress by depicting the results in plots for easy monitoring
2.2.1 Body composition Graph
2.2.2 Over hydration Graph
2.2.3 Hydration reference graph
2.2.4 LTI and FTI Graphs
2.2.5 Nutrition reference Graph
2.3 The system should need to allow export of all plots and tables for further analysis
2.4 The system should need to allow the combined analysis of blood pressure and fluid overload
2.5 The system should need to offers convenient data management:
2.5.1. Organize patients into groups
2.5.2. Add missing data, comments or ID create new patients and patient groups

3) Technical Requirements:
3.1 Measurement time approx.2 min
3.2 Data output: LC-Display; integrated SmartCard writer
3.3 Measuring frequency range: 50 discrete frequencies in the range from 5 – 1000 kHz
3.4 Battery Back up – Capacity 5 hours, which need to measure 150 patients.
3.5 AC adapter: 100 – 240 V AC; 50 – 60 Hz
3.6 Operating conditions: 0° – 35°C, 30 – 70% humidity
3.7 The system weight should need to be less than 3 Kgs.
3.8 Medical product class: IIa

4) Accessories:
4.1 The offer shall be completed with all necessary accessories which are essential for the normal operation of the equipment. Details shall specified by tenderer(s) complete with itemized price(s). Hospital Authority reserves the right to accept all or part(s) of the offer.
4.2 The offer shall be completed with all necessary accessories which are essential for the normal operation of the equipment. Details shall specified by tenderer(s) complete with itemized price(s). Hospital Authority reserves the right to accept all or part(s) of the offer.
4.3 The Successful tender shall be keep reasonable stock level for normal necessary consumable items

5) CE Certified.

Group-E: Neurology

1: Specifications For Transcranial Doppler

1. Two Channel Transcranial Doppler capable of Intracranial, Extracranial and intraoperative use.
2. Should be supplied with 2 MHz PW probes (2 Nos.) for Unilateral Monitoring and 2 Nos. of 2 MHz Monitoring Probe for bilateral Intracranial Monitoring, Total 4 Nos. of 2 MHz Probe.
3. Should be supplied with 4 MHz (1 No) CW & PW for extracranial monitoring.
4. Should have ability to modify the spectrum after freeze and change the Depth, Gain, Scale, Sample Volume and High Pass Filter.
5. Should have ability to view spectrum in review station and allow to modify the spectrum by changing the Depth, Gain, Scale, Sample Volume and High Pass Filter.
6. Should have built in VESA to easily mount the system to a cart.
7. Should be Cybersecurity ready according to recent US FDA guidelines.
8. Should allow unlimited protocols to be added.
9. Should have dedicated protocols for specialty tests including protocols for Sickle Cell Disease and Vasospasm with configurable thresholds for automatic interpretations. Each specialty test protocol should have a dedicated print layout with a separate configuration.
10. Should have ability to modify number of spectrum windows in offline and change the depth of each spectrum window in offline.
11. Should have ability to modify Depth in offline, then replay the new depth with spectrum and Doppler audio.
12. Should have main key that allows completing a protocol with just one main key.
13. Should have automatic save to ensure no measurement is lost.
14. Should have HITS Analysis display to allow accurate analysis by browsing through detected HITS in a time resolution up to 64 times faster than spectrum.
15. Should support network share of examinations, patients and review stations using background sync.
16. Should support optionally connecting to hospital SQL server to share a database.
17. Should support loading examinations and replaying from the Doctor's computer and office.
18. Should support Special design layout for each test so that each type of test can have a separate completely customized configuration for screen layout and print layout.
19. Should have patient details customizations including customized free text fields, patient status fields, risk factors, physical examination, additional fields, symptoms and indications fields, diagnosis codes.
20. Should have automatic protection of insonation power during Ophthalmic and Siphon measurements.
21. Should have BHI (Breath Holding Index) calculation for Breath Holding protocol.
22. Should have customized screen layout including modifying screen location of M Mode, parameters, etc. for enhanced ease of use.
23. Should have Statistics including collection of pie charts and advanced X/Y chart to review different patient related statistical data.
24. Should have advanced statistics with Excel support to export entire database to Excel.
25. Should have password protection to protect from accidental changes.
26. Should have self-diagnostics procedure including a report.
27. Should have Velocity Profile display.
28. Should have Depth Scanning option.
29. Should have 4D Analysis display.
30. Should have Automatic Interpretation Labels including threshold displays.
31. Should have zoom in/out option for parameters trends using drag & drop.
32. Should have configurable alerts for monitoring.
33. Should have delta mean marker for monitoring.
34. Should allow quick review of previous exams by browsing through all summary screens of past examinations with few clicks.
35. Should have customized physicians and examiners list.
36. Should have advanced database search based on criteria including dates, protocol, risk factors, etc.
37. Should have Anonymous Output option to export PDF files anonymously for research purposes.
38. Should have flexible configurable storage settings so that the user can decide exactly what is saved and what is not for optimal disk space use.
39. Should have a data compression algorithm to optimize use of disk space.
40. Frequency range: pulsed wave: 3 – 24 KHz.
41. Should have color M mode feature with able to re-adjust the **500 gates** digitally per probe.
42. Should have multi-frequency operation.
43. Should have automatic emboli detection with option to detect all HITS on all gates in the entire depth range.
44. Should have user-definable defaults for individual blood vessels.

45. Should have interactive summary screen which displays all studies performed on a patient on a single screen, enabling immediate comparison between the right and left sides of the brain.
46. Should have long term monitoring with trending of selected parameters.
47. Probe Holder should have fixation device.
48. Should detect flow velocity at the contra-lateral side of the brain with its high doppler sensitivity.
49. Should have 8 Analog inputs and 4 Analog output to interface analog signal from ETCO2 or any other analog device to and from this system.
50. Should display 8 different doppler spectrum windows in 8 different depths simultaneously.
51. Should have manual control of gain.
52. Should have Vasomotor Reactivity Test.
53. Should have FFT size of 256 points.
54. Should have ability to change spectrum display size from 1 second to 3 minutes.
55. Should be able to display Pulsed wave parameters like Peak Velocity, Mean Velocity, Diastolic Velocity, Pulsatality index, Resistivity index, Heart rate.
56. There should be provision of up to 6 vertical and 2 horizontal cursors for measuring the values manually.
57. The system should measure beat to beat pulse. (heart rate)
58. Should have 16 colour spectrum display and able to display up to 8 spectrums with Color M mode feature.
59. Should have power M-mode display option.
60. Should be able to generate report, with option of transferring all waveforms into report.
61. Should have facility of storing the waveforms of complete spectrum with audio digitally and replaying with audio the complete study as recorded.
62. Should automatically Calculate Lindegaard Ratio.
63. Should have facility to export the recorded study to WMV format.
64. Should have availability of remote control along with the main unit.
65. Should be supplied with inbuilt PC of Quad Core 2GHz, 4 GB RAM,18" inbuilt LED multi-touch panel monitor, 1 TB Hard disk drive, 4 USB 3.0 Ports, Genuine Windows 10 operating system, Mini Keyboard, Optical Mouse.
66. **Should have internal inbuilt 6 hours Rechargeable Battery Standalone.**
67. Should have **TCD Robotics Headset** to assist the user in quickly and Automatically insonating and monitoring cerebral blood flow.
68. Should be Portable System. It should be single unit and not separate laptop or computer.
69. The data can be exported of any display in either Excel, PDF, RTF format.
70. Should be supplied with Color Laser Printer.
71. Should be supplied with UPS of suitable rating and Metallic trolley with castor.
72. Should be provided with DICOM facility.
73. Should support HL7 Patient Registration / Orders / Report / Query Patient Details.
74. Should support Automatic PDF Report Export with a customized file path & name template.
75. Should be US FDA Approved. Certificate should be attached.

2: Apheresis Machine

1 Continuous Flow Blood Cell Separator
2 Apheresis machine must have built in return line air detector to avoid air embolism
3 Built in automated protocols for majority (4 of 6) of the below procedures.
  a. Leukoreduced Plasma Collection
  b. Therapeutic Plasma Exchange.
  c. Single or double RBC collection and/or RBC Exchange.
  d. Peripheral Blood Stem Cell Collections
  e. Granulocyte Collection.
  f. Leukoreduced platelet collection
4 Automatic Pump Loading & Priming of disposables sets.
5 Automated Self-test to ensure maximum patient Safety
6 It should have access, return and centrifuge pressure sensor
7 Built in Automated Interface management system
8 Separate Anticoagulation pump with custom programming adjustability
9 Built in Bolus management function
10 Configurable maximum volume depletion levels either by weight or percentage of Total Blood Volume.
11 Intuitive Graphical user interface
12 Must have built in Folding touch screen with colour LCD screen
13 Cassette systems with automatic loading of pumps, valves and sensors
14 Built in ACD Detector
15 Should have Custom prime management (e.g. blood prime)
16 Audio visual alarms.
17 Periodic Instrument Calibration certificate for the various parameters and QC of the products should be provided/ maintained by the vendor.
18 US FDA/ European CE (Issued by a notified body) approved Model should be offered.

19 Power Supply 220VAC +/- 10 %, 50Hz
20 Online UPS of suitable rating with voltage regulation, spike protection and maintenance free batteries for 60 minutes back up

3: High Frequency Ultrasound Machine for Nerve and Muscle Examination

Ultrasound Machine with Color Doppler Specification:-
Product & Manufacturer Quality Standards:
Should be USFDA and European CE approved product.
Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard)
Technical Specification:

- Multipurpose High Density full digital color Doppler system
- Offered system should have whole body scanning Applications & software for have a wide range of applications includes: abdominal, OB/Gyn, cardiology, urology, small parts, vascular and MSK applications.
- System should have following Scanning Modes: B, Dual B, Quad B, THI, PIH, Trapezoid Imaging, Real-time Panoramic Imaging(B mode), M, Color M, Anatomic M, Color Doppler, Power Doppler Imaging, Directional PDI, TDI, PW with HPRF,CW, Dual-Live, Duplex:B and Doppler/M, Triplex: B, Color Flow, and PW/CW Doppler.
- Should have Full digital ultrasound beam forming technology
- Should have Auto Image optimization function, Physical key should be available on the keyboard for easy access. It should also offer8 slider controls for TGC
- System should have minimum 21" high resolution display with swivel and tilt facility.
- Touch Screen - 9inches or more
- System should have 3 probe Connectivity ports as standard which can support all transducers.
- Probes offered should be Broad band frequency probes offering at-least user 3 selectable frequency range.
- System should offer Scanning depth upto 33 cms
- Should have at least 256 gray scale for better imaging
- System should have 2 TB or more hard disk for digital image storage
- System should have at-least 3 ports of Hi Speed USB for data transfer and inbuilt CD/DVD writer
- System Should have multiple focusing method minimum 6 focus
- System should have Cine loop of minimum 1500 Frames or more
- System should have Tissue Harmonic Imaging Facility with all the probes
- System should be provided with DICOM connectivity as standard
- System should have Calculations of full OB/GYN calculation package, Vascular calculations, Urology calculations, Cardiac Calculations, Doppler calculations, Auto Trace
- System should be compatible to Volume 3D Imaging
- The digital processing channels should be 1, 80,000 or more for better resolution and penetration.
- Broad Band Convex probe (2 to 6 MHz)(+/-1)
- Broad-spectrum linear probe (8 to 16 MHz)(+/-1) for MSK superficial application
- Broad-spectrum linear probe (6 to 12 MHz)(+/-1) for Small Parts, Vascular, Pediatrics, Neonatal, Musculoskeletal Broadband Phased array cardiology transducer: 1-4 (+/-1) MHz for cardiac imaging.
- **Power Supply:**

Power unit: Input voltage-220V-240V AC, 50Hz Single-phase Should be provided with online UPS of appropriate KVA for power backup of minimum 30 minutes.

- **System should have capability of the following:**
  - Raw data post-processing
  - Onboard tution for quick learning
  - B-flow & B-flow Color
  - Strain Elastography
  - Gel Warmer
  - TUI
  - Stress Echo
  - AutoEF
  - Breast Care
  - Follow-up Tool
  - Thyroid Productivity

4: RTMS Machine (Repetitive Trans Magnetic Stimulation Machine)

Technical Specification of Transcranial Magnetic Stimulator (TMS)

1. It should be a highly effective non-invasive repetitive biphasic magnetic stimulator for bilateral cortical or peripheral and central nerve pathways stimulation
2. The system should be able to deliver output power as per the following.
   a. should deliver 100% power at 41-42 Hz
   b. should deliver 50% output at 96-100 Hz.
3. The system should have
   a. Integrated color touch screen display.

b. Integrated 2 channel Motor Evoked Potential.
c. Should be programmable to deliver Single pulse or Repetitive train of sessions.
d. Theta Burst Protocol.

4. The pulse train interval should be user selectable with 0.1s increment and pulse width of 400 µs with maximum upper frequency of 100 Hz
5. The machine should be provided with EMG Interface module.
6. The system should be supplied with following Accessories:
   a. 70mm - 100mm AIR COOLED coil- 1 no.
   b. 70mm double Air film- 1 no. The coil should have integrated air circulation system which should deliver up to 3000 pulses at 120 % motor threshold at 10 Hz stimulation (Biphasic waveform) over a 30-minute period and remains within allowed temperature limits.
   c. **70 mm - 100 mm** double Placebo coil- 1 no.
   d. 360-degree articulated coil Stand for positioning coil at any position on patient.
   e. In built stand for the main unit
7. Store and retrieve setups and protocols
8. Transfer data to external devices via USB or serial port
9. Advanced Power Pulse for 40 % additional stimulation power
10. Versatile In/Out triggers for EEG, EMG and EP equipment
11. Should have facility for charge delay for TMS Synchronized EEG.
12. Should be supplied with patient comfortable chair
13. The equipment should also have provision to attach other coil such as 90mm high power circular coil, 110mm double cone coil with RTMS system and the rates of these coils should be quoted separately.
14. Should have an intelligent thermal protection for temperature management of the coils.
15. Automatic sequence set-up and user-definable protocols
16. Should be Upgradable for interleaved TMS/fMRl study
17. Should be European CE with four digit notified body no. / USFDA / BIS certified. Copy of the certificate / test report shall be produced along with the technical bid.
18. Warranty & CMC as per tender terms.

5: Autonomic Testing Lab (Tilt Table Machine)

The system should be able to record and analysis
1. Non-invasive beat to beat continuous Blood pressure monitoring in Human with Systolic, Diastolic and other hemodynamic parameters like CO, SV, TPR, Baro-reflex sensitivity, Blood pressure variability etc. By finger arterial pressure measurement.
2. Continuous ECG monitoring and recording with real time cardiac axis, Vector analysis and HRV Analysis.
3. At least 4 channels capable of recording ECG, EMG and EEG.
4. Dynamometer to study handgrip strength profile with balance board for static posturography studies.
5. Hand-Held Non-Invasive Pulse Tonometer for Vascular function Testing. (Qty 1). 6. Number of channels: 8 or more channels high speed USB Data Acquisition system.
7. High sensitivity and sampling rate of 10 KHz or more per channel (aggregate speed).
8. ADC resolution = 16 bits or more.
9. The Beat to beat Blood pressure monitor should be supplied with Height correction and Finger cuffs of 3 different sizes (i.e. small, medium & large) and should have accuracy: 1% of full scale (max. 3 mmHg), zeroing automatic.
10. Transducers for Finger PPG, Respiration Sensor, Airflow, GSR, Temperature measurement, Hand dynamometer and Wireless heart rate belt transducer and other accessories required.
11. Licensed Software: It should have various automatic analysis modules online and offline analysis for ECG, HRV, Blood pressure, Cardiac output, Peak analysis, spike histogram etc.
12. Online & offline analysis with various export options for common formats like MS Excel, Matlab etc.
13. The software should be provided with a 5 year of free updates and upgrades.
14. Computer systems:- Intel Core i7, Genuine Windows 8 professional, 20 inch LED Monitor, 4GB RAM, 1 TB Hard Drive, DVD. Facility for internet connectivity, Laser printer and 2 KVA UPS along with trolley and working table.
15. Motorized electric tilt table:-
    - Safe working load and lifting capacity (from minimum height) of 180 kgs
    - Large wheel design, with central locking & steering facility.
    - Individual banking castors with electric height and tilting operation with hand switch control and tilt angle inclinometer as standard.
    - Adjustable angle dual foot boards-positive and negative (+15 to -30degrees).
    - Lowers to wheelchair height for ease of patient transfer.
16. Proper demonstrations to be carried out before finalizing.
17. Onsite training should be provided by the company experts for 7-10 days.
18. 5 years warranty.
19. Should be European CE/USFDA/BIS certified.
20. The system should have world-wide installation, acceptance and recognition in published research papers globally. Performance certificates should be provided from the user using the system in India /abroad.

6: 8 Channel EMG/ NCS/ EP System with Ultrasound

1) The system should have 8 (Eight) channel and should have 2 non-Switched Channels and 6 switched Channels and must have facility to use in any combination.
2) The Amplifier should have at least 8 (Eight) optically isolated channels with 24 bit ADC, CMRR should be >110 dB, Input impedance should be >100 Mega Ohms, Sensitivity from 1µV/division to 10mv/division, Noise should be <0.7 µV RMS and should have a time base range of 0.2ms/div to 5sec/div.
3) The system must have "**24 bit A/D Converter"** with 48 kHz sampling rate per channel.
4) The system should be supplied with electrical stimulator Probe with control buttons.
5) System should have Electrical Stimulator with option for Constant voltage and Constant Current Electrical stimulator with both current (0 to 100mA) and voltage (0 to 400V) stimulation facility.
6) The system should have Averager Display Sensitivities of 0.01µV/division to 100mV/division in 22 steps depending on test.
7) System should be a latest and advanced design which make it possible to disconnect and reconnect the amplifier without powering of the base unit
8) The system should have the facility for rapid selection of side and anatomical area.
9) The system should have the facility for recalling waveform data and diagnostic findings for quick comparison and review.
10) The system should have a facility to capture acquisition/online screen both as picture or as a movie which can be incorporated into reports, training materials, publications, presentations etc.
11) The Stim intensity should be reset to zero when a new nerve conduction study is started.
12) Facility for Indication of high impedance across stimulator pins.
13) The System should have patient database software to optimize patient handling.
14) Facility for No stimulation when amplifier is OFF in Nerve Conduction Study.
15) The system should have the following application Softwares as standard:
    - Motor and Sensory nerve conduction, Motor and Sensory combined Nerve conduction, F-wave, H-reflex, Blink reflex, Repetitive nerve stimulation test, Collision studies, Carpel Tunnel Sensory Index (CSI) and Inching.
    - It should have packages for doing EMG acquisition and analysis, quantitative analysis of EMG (facility to record/Replay EMG on Hard Drive for at least 5 minutes or more) and Interference pattern analysis with QEMG.
16) The system should also have the facility to perform the following test:
    a. Auditory Evoked Potential (AEP), Visual evoked Potential (VEP), and Somatosensory Evoked Potential (SEP).
    b. The system should have the special test such as Autonomic Exams (R-R Interval/ Valsalva with metronome, Sympathetic/ Galvanic Skin Response), Single fiber/ Macro EMG analysis, Multi-MUP analysis, Spike Triggered EMG, Bereitschafts Potential and P300 / CNV test.
    c. System should have advanced NCV Software (includes Conduction Velocity Distribution CVD), Triple Stimulation Test (TST), Tremor Analysis, CMAP Scan software and MUNIX Software.
17) The system should be supplied with Photic Stimulator.
18) The System should have facility for performing Single fiber EMG tests like Volitional single fiber EMG, Stimulated Single fiber EMG, Fiber Density, Macro EMG and Jitter analysis.
19) System should have Jitter computation using level and peak based interpotential intervals.
20) The System should have the facility for performing EMG tests like Routine needle EMG study (spontaneous and volitional EMG recordings), Single motor unit potential analysis using trigger/delayline/averager, Mutichannel EMG recordings, Mutichannel recordings with amplitude trigger/delayline/Averager, EMG recordings using single or multiple channels, Motor unit number estimation, Heart rate variability, Quantitative EMG test like Multiple Motor unit analysis, turns and amplitude analysis.
21) System should be supplied with Nerve Ultrasound system with 8 - 15 MHz scanning frequency Probe with Full digital B Mode.
22) The System should have facility to Replicate and grant average, automation and hearing threshold testing in AEP.
23) The system should have the facility to store all the stimulated waveforms with roll back and roll forward in all channels (on-line and off-line mode), thus facilitating the user to select the desired waveform/best response and thus eliminates the unnecessary stimulation.
24) The System should have the facility to compare Left and Right side and more than that it should have the facility to compare current visit to previous visits.
25) The system should have the facility to record four traces in the same channel display (replicate) and replicate average to have a higher quality study.
26) The system should have the facility to perform averaging the waveform in the off-line and on- line mode.
27) System should be designed in such a way to "**reduce the stimulus artifact in Sensory Nerve conduction"** to get better baseline and in F-Wave for hiding the M-Portion during

F-response Time making it easier to identify the response and place markers.

28) The System should have functionalities like Quality meter and firing rate meter.
29) The System should have unlimited EMG storage and should playback the EMG data in any computer.
30) There should be possibility to record EMG data in such a format that it can be played with Sound in windows media player on any PC without need for any additional software to be uploaded on the PC
31) The system should have Automatic online summary report facility based on Institute reference values.
32) The system should have the facility for Institute standard Microsoft Word Online Report generation.
33) The System should be provided with Compact Mobile Cart / Trolley.
34) The System should be provided with a Desktop Computer with the latest i5 or later Intel based processor with a minimum 1 TB Hard Disk, 8 GB RAM, DVD/CD-RW drive, keyboard, mouse, 24" Flat Panel Colour monitor, Laserjet Printer and Online UPS of capacity 1 KVA.
35) The system shall be supplied with the following, but not limited to:
    - Disposable 37 mm (26G) concentric needle, Qty: 25 Nos.
    - Disposable 25 mm (30G) concentric needle, Qty: 25 Nos.
    - Concentric needle cable, DIN connector, 1m, Qty: 2 Nos.
    - Disposable 50 mm (26G) concentric needle, Qty: 25 Nos.
    - Felt pad stimulating electrode, 23 mm spacing, 6 mm diameter felt pads.
    - Shielded digital ring electrode, DIN connector, 1 m,
    - Disposable Ag/AgCl tab recording electrodes
    - Alligator clip shielded cable with 3 wired cables and DIN connector, 1m,
    - 10 mm tangle free gold cup electrodes, 1.5 mm TP connector, 2m,
    - Interconnection cables
    - Reusable ground strap electrodes, 18.5 cm, 1.5m lead length,
    - Conductive gel, water soluble,
    - Conductive paste,Qty: 6 Nos.
    - Single Fiber EMG Needle set, Qty: 1 No.
    - Skin preparation gel, Qty: 6 Nos.
36) System should have CE & USFDA Certification.

7: Long Term & Quantitative EEG System with Video

1. General Description

a) The unit shall be intended as Video EEG System supporting clinical EEG, LTM studies, intracranial recordings and clinical research.
b) The unit shall also be capable as a PSG diagnostic tool for recording and analysis of patient's sleep pattern for both Adult and Pediatric studies. System has to be simple to operate and set up, and requiring minimum maintenance.
c) System and software can be upgraded and reports customized.
d) Able to trend multiple channels and do split screen recording.
e) Able to work with all devices that offer output of +/- 5 volts.
f) Video EEG System Hardware and Software should be able to work with Windows 7 Ultimate/Windows 10
g) IP PTZ Camera available
h) Custom designed cart

2. Technical Specification

a) Min number of channels: 64 Channel upgradable to 256 Channel
b) Amplifier should be Portable and patient-worn (less than 700 g weight with batteries)
c) A/D bits: 224 bit
d) Common Mode Input Impedance: 21 GOhm
e) Common Mode Rejection Ratio: ≥ 110 dB min
f) Maximum Sampling Rate: ≥ 16 kHz
g) Selectable storage frequency up to at least: 16KHz
h) Isolated DC channels: ≥4
i) Extra channels: ≥3 (SpO2, HR and Pleth signals)
j) Input Signal Range (Differential): ≥20 mVpp
k) Bandwidth: 0.01 Hz-3.76 kHz (sampling rate dependent)
1) Integrated, fully software managed Digital Switch Matrix and connection for external Cortical Stimulator
m) LED status indicator on breakout box
n) Standard 10-20 Channel Inputs with numerical labels

3. IP Camera Requirements

a) High Definition (HD), Day/Night, Network Pan/Tilt/Zoom Rapid Doom Camera
b) Compliance with SMPTE 296M: pixels (1280 X 720), 16:9 Format
c) Maximum Frame Rate: 30 frames per second
d) Compression Formats supported: (H.264, MPEG-4, JPEG and dual streaming capability
e) Network Interface: 8-pin RJ-45 connector, 10 Base-T/100Base-TX Ethernet, supporting IPv6 and IPv4
f) Control Functions: Pan and tilt, zoom and focus, 256 user defined presets, with accuracy of range 0.045 degree

g) Minimum scene Illumination: 1.0 lx (color mode) 0.10 lx (black and-white mode)
h) Resolution: 720p HD picture quality 1280 X 720 pixels maximum resolution, supporting H.264 at 30 fps (IP) with Optical Zoom Capability: 28X and Digital Zoom Capability: 12X
i) The System shall be provided with SW remote control function for assuring the complete control (pan /tilt/zoom) of the HD PTZ DOME camera without using any external HW console

4. General features
a) Database should be based on MS SQL server
b) The database shall have the capability to create customized queries
c) The system shall have various quantitative analyzers to help user review studies (Spike and Event Detection, Quantitative d) The systern shall be able to work with 3d party spike and event detectors like Stellate's Detectors by Prof. Gotman and Persyst, having them integrated in the same Graphical User Interface
e) Data-Stream Wizard (DSW) for efficient clinical and research workflow Recording at same time in Live EEG Recording

5. Acquisition and Review Computer Should have following Min:
a) Processor: Intel® Quad Core, i7 or higher processor ≥ 3 GHz
b) RAM:28 GB 1600 MHz DDR3 Memory
c) Hard disk capacity :22 TB SATA Hard Drive
d) Display i Type: Flat screen color LED ii. Size: 2 min 24"
e) Minimum resolution: 1,600 x 1,200
f) Storage device: DVD (+/-RW)
g) Operating system : Microsoft Windows 7 64 bit/Windows 10
h) Connectivity: At least one RJ-45 network connector
i) The computer shall be equipped with Microsoft Office 2010/2016.

6. Consumables
Silver Cup EEG Electrodes: 144 Nos.
Ten20 EEG Paste: 20 Nos.
Skin preparation Gel: 20 Nos.

7. System should have CE & USFDA Certification

8. Local Service Facility must be available in Patna

8: 64 Chanel Video EEG System

1	Video EEG system with more than 64 channels of amplifier
2	Must have minimum 40 referential Channels and 24 Programmable (from Differential to Referential) and minimum 8 DC Channels.
3	Amplifier must also have built-in Oximetry, patient event button and photic connectivity
4	The Electrode box should be of design of 10-20 International EEG Electrode Placement (Head Shaped)
5	Analog to Digital converter : 24 bits of ADC resolution or better
6	Sampling rate : 4 KHz or better for each & every distinct channel. Sampling Rate should not go down with increase in number of channels.
7	Common Mode Input Impedance should be greater than 1000 MΩ
8	Built in Digital Switch Matrix (DSM) with complete software and accessories required
9	Input Noise (Peak to Peak) < 2 µV
10	Input Bias Current <1 nA
11	Amplifier connectivity : both Ethernet or USB or along - with better
12	Must support both Static and Dynamic IP address while connecting to network
13	Amplifier and patient electrode connection box must be two separate devices so that least damage happens to the amplifier when mishandling of the electrode connection box happens.
14	The electrode connection box should be so isolable that patient can carry electrode connection box while moving.
15	Patient electrode box should be a portable one and light in weight.
16	The system should have the capability of acquiring data from both cap electrode and disc electrode.
17	Amplifier Should have an option to connect the Cap directly with single connector on amplifier and not by individual connector for each channel.
18	EEG Electrodes – 200 Nos., Patient Event Button – 2 Nos.
19	EEG Paste - 100 Nos., Skin Prepping Gel – 20 Nos.
	Software:
20	Should have ability to continue a previous recorded study in the software. i.e. appending the previous record on a later date or time
21	Should have facility to configure data acquisition to start periodically in an automated fashion.
22	Software should allow the user to prune the EEG and Video data.
23	Software should have security features to allow / deny access to users to various function based on user profile.

24 Should have report generation facility in MS-Word format, which can be later assigned to particular patient.
25 Should have Individual Channel Control, Customization of Montages, along with remontage Capabilities through tool bar acceleration buttons.
26 Should Combine all user defined settings into templates or protocol, for use in different applications and the protocols should be available for user by a menu selection.
27 Should arrange montages into sets for different patient groups & should display a graphical view of the current montage during the EEG recording.
28 Should define New Sensors should be included as standard viz assign to amplifier inputs, define traces in a montage, define calculated channels (Average, Source/ Laplacian), or define Trends.
29 Facility to click any point to display corresponding traces & Slide pointer to change displayed duration of the Overview. Display of Time Scale in either elapsed time or time of day.
30 Sortable list of all events placed in the recording, both automatically and manually placed such that when event is click, it show corresponding EEG.
31 Review and add events to recorded traces in Review Pane while still displaying live traces in Live Pane.
32 Should have Spike and Event Detector Software
33 Should have Sleep Analysis hardware and software in order to record various physiological parameters like SaO_2,Heart rate, CPAP, Airflow, Leg movement apart from EEG,EKG and EMG.
34 The Sleep staging software should have Automatic and manual Scoring and Staging and also have advanced Apnea analysis, Periodic leg movement analysis, ECG Analysis, CPAP Titration, Respiratory disturbance index, Apnea/ Hypopnea index.
35 Sleep Electrode Starter Kit to consist of : Sleep Transducers complete for Air flow, Snoring Sensor, Chest/Respiration sensors, Periodic Limb Movement, Nasal Cannulae (50 Nos.), SPO2 Probe, Body Position

Photic Stimulator and HV:

36 Should be supplied with an photic stimulator on an adjustable stand so that photic artefacts doesn't interfere EEG signals with Manual and automatic programmable through software
37 Automatic time counters and event insertion during Hyperventilation.

Video Camera (2 Nos.):

38 Should have facility to record patient video using high resolution camera with fully synchronized Video or better.
39 System should have Facility for Video Compression and should Supply with High resolution PTZ Zoom Camera and IR camera
40 Wall mounted High resolution Digital video Camera.
41 Synchronization between Video & EEG recording
42 Specs for Video Camera as follows:
43 1/4" EXview HAD CCD Sensor, Minimum Illumination: 0.65 Lux, 28x Optical Zoom Lens or better, Robotic Pan, Tilt and Zoom, IR Remote Commander Unit, Fast f/1.35-3.7 Maximum Aperture

Acquisition Station Computer:

44 Desktop system with Core i5 or better available processor 4 GB RAM
45 2 TB or higher available HDD
46 Should come preloaded with Microsoft genuine windows 10 with latest service pack
47 Should come preloaded with genuine latest Microsoft Office.
48 Should be preloaded with genuine antivirus tool.
49 The data acquisition system should be supplied along with-recovery software created while initializing the machine.
50 DVD Writer and reader, key board, optical mouse with standard accessories
51 UPS 1 KVA

General Specification:

52 It is mandatory that the system should be Certified US FDA approved. Vendor to attach the Certificate clearly mentioning the model, address of manufacturer and validity on the certificate.
53 Review system must be supplied including the separate computer system with required review software to analyze the acquired data from Acquisition system in real time.
54 Bidder should have authorization certificate from the principle company.

9: 4 Chanel Digital EMG/ NCV/ EP System

1. NCS/ENMG /EP System should have at least 4 Channels.
2. NCS/ENMG /EP system should be based on Windows 10 64-bit Operating System Desktop PC with min with latest Intel Processor, 8 GB RAM, Min 1TB GB HDD, DVD RW Drive, Gigabit network interface card and Good quality keyboard & optical mouse with scroll wheel Etc.,
3. Amplifiers should have at least 4 Optically Isolated Channels with 24-bit ADC, CMRR should be > 120 dB, IMRR > 150dB, Input Impedance should be > 1G Ohms Noise Level < 0.45 µV, Sensitivity from 10 nV/division to 100 mV/division and Filters 0.5 Hz to 20K Hz
4. System should have Duel Electrical Stimulators with option for Constant voltage / Constant Current Electrical stimulator with both current (from 0 to 100mA or more) and voltage (0 to 400V) stimulation facility
5. The system should have the following Application software as standard

- Motor and Sensory Nerve conduction, Motor and Sensory combined Nerve conduction, F -wave, H-reflex, Blink reflex, Fully Automated Repetitive Nerve stimulation test, inching, CSI Index Study
- It should have packages for doing EMG acquisition and analysis, quantitative analysis of EMG (facility to record/Replay EMG on Hard Drive for at least 5 minutes or more) and Interference pattern analysis with, QEMG, Single Fiber EMG
- MultiMUP EMG, Turns @ Amplitude Analysis etc.
- Somatosensory SEP, ABR, Pattern Reversal VEP, LED Goggles VEP etc.,
- Special Test such as Single Fiber EMG, P300, VEMP, MUNIX, SSR, R-R interval variation, Tremor Analysis.

6. There should be possibility to record EMG data in such a format that it can be played with Sound in windows media player on any PC without need for any additional software to be uploaded on the PC.
7. The system should generate automatic online Summary Report based on Institute Reference values
8. The system should have facility for Industry standard Microsoft Word Online Report Generation.
9. Standards Set of Consumables of
   Motor and Sensory Electrodes Pairs – 4 pairs
   Ground Strap Electrodes – 2 No's
   Ground Plate Electrodes – 2 No's
   Bipolar Stimulators – 2 No's
   Needle Holder for Concentric Needles – 2 No's
   Disposable EMG Needles – 2 Boxes (Box of 25)
   Digital Ring Electrodes – 2 No's
10. System should have CE & USFDA certification.

10: 3 Channel Portable NCV/ EMG/ EP

1. NCS/ENMG /EP System should have at least 3 Channels.
2. NCS/ENMG /EP system should be based on Windows 10 64-bit Operating System Laptop PC with min with latest Intel Processor, 8 GB RAM, Min 1TB GB HDD, DVD RW Drive & optical mouse with scroll wheel Etc.,
3. Amplifiers should have at least 3 Optically Isolated Channels with 24-bit ADC, CMRR should be > 120 dB, IMRR > 150dB, Input Impedance should be > 1G Ohms Noise Level < 0.45 µV, Sensitivity from 10 nV/division to 100 mV/division and Filters 0.5 Hz to 20K Hz
4. System should have Duel Electrical Stimulators with option for Constant voltage / Constant Current Electrical stimulator with both current (from 0 to 100mA or more) and voltage (0 to 400V) stimulation facility
5. The system should have the following Application software as standard
   a. Motor and Sensory Nerve conduction, Motor and Sensory combined Nerve conduction, F -wave, H-reflex, Blink reflex, Fully Automated Repetitive Nerve stimulation test, inching, CSI Index Study
   b. It should have packages for doing EMG acquisition and analysis, quantitative analysis of EMG (facility to record/Replay EMG on Hard Drive for at least 5 minutes or more) and Interference pattern analysis with, QEMG, Single Fiber EMG
   c. MultiMUP EMG, Turns @ Amplitude Analysis etc.
   d. Somatosensory SEP, ABR, Pattern Reversal VEP, LED Goggles VEP etc.,
   e. Special Test such as Single Fiber EMG, P300, VEMP, MUNIX, SSR, R-R interval variation, Tremor Analysis.
6. There should be possibility to record EMG data in such a format that it can be played with Sound in windows media player on any PC without need for any additional software to be uploaded on the PC.
7. The system should generate automatic online Summary Report based on Institute Reference values
8. The system should have facility for Industry standard Microsoft Word Online Report Generation.
9. Standards Set of Consumables of
   - Motor and Sensory Electrodes Pairs – 4 pairs
   - Ground Strap Electrodes – 2 No's
   - Ground Plate Electrodes – 2 No's
   - Bipolar Stimulators – 2 No's
   - Needle Holder for Concentric Needles – 2 No's
   - Disposable EMG Needles – 2 Boxes (Box of 25)
   - Digital Ring Electrodes – 2 No's
10. System should have CE & USFDA certification.

11: Portable 32 Channel EEG System

1. The system shall be manufactured by an ISO-9001, US FDA/European CE and ISO- 13485 certified manufacturer.
2. The system shall be certified and tested by a recognized test organization for compliance to IEC 60601-2-26 Particular Safety of Electroencephalography Equipment.

3. Digital EEG recording system should have the laptop having Windows 7 Operating system with minimum CPU Configuration of Intel 13 Processor, 4 GB RAM, 1 TB hard disk capacity, DVD-Writer.
4. High Quality EEG Amplifier should available with Industry Standard Ethernet Amplifier Interface shall provide at least 34 electrode inputs (32 EEG Plus 2 DC) which are optically isolated and certified to at least type CF classification.
5. System should have SQL based software.
6. The Video EEG amplifier shall be equipped with a minimum of 16 bit Analog-to-Digital Converter (ADC), CMRR > 115 dB, Sampling frequency of 2000 Hz and input Impedance of>100MΩ and bandwidth of 0.05 to 500Hz
7. The amplifier system should have facility to configure at least 9 pair of electrode inputs as bipolar inputs, as appropriate to accept Polysomnography signals and shall have integrated Pulse Oximeter.
8. The system should have a method to detect a poor electrode connection and provide a notification to the user and also should be possible to test Continuous electrode impedance.
9. It shall be possible to View the EEG data in any PC without loading any software.
10. System should have facility to upgrade with Video for Video EEG recording. With facility to record selective video by allowing automatic video recording only when specific user defined events occur.
11. The Patient/Data Management software shall be available with optional hardware and software to provide an interface between the Patient/Data Management software and a Hospital Information System (HIS) via an HL/7 (Health Level 7) communications protocol.
12. The System should have Networking facility.
13. The system should be supplied with complete set of electrodes and consumables.

Group-F: Paediatric Surgery

1: Paediatric Laparoscopy Set 4 K with 2D- 3D display system with Fluorescence Imaging

Advance Visualization Tower - 3Din 4K resolution With Fluorescence Imaging (ICG)

1	**Processor**
	Processor for following should be quoted.: 2- Dimensional endoscopic video camera in 4K resolution (3840*2160) 3-Dimensional endoscopic video camera in 4K resolution (3840 *2160) Slot for Video Scopes (Digital Scopes/Chip on tip) likeVideo Choledochoscope,VideoCystoscopes etc. System should have facility for Optical Contrast Differentiation System, and it Should have special filter for observation of capillary vessels and fine patterns in the superficial layer of mucosa for early detection of lesions. System Should be capable of Near Infrared Fluorescence Imaging (ICG application) with below features: **Overlay:** White light image with superimposed display of NIR/ICG fluorescence. Possible to select the preferred color for NIR/ICG imaging: Either blue or green. **Monochromatic:** NIR/ICG fluorescence signal in white. Background in black for maximum contrast. **Intensity Map:** White light image with superimposed display of NIR/ICG fluorescence. NIR/ICG signal display will appear in different colors depending on the strength of the detected NIR signal. Picture in Picture of visualization modes with Standard and Optical Contrast Differentiation. Automatic adjustment of light intensity of light source and controlled from Camera head. Inbuilt recording facility for both Images and Videos or Medical Grade External recorder should be provided to record both Images and Videos. Outputs: All Compatible outputs should be there (12GSDI, Display Port) for 4K resolution and DVI for HD resolution.
2.	**32- and 55-Inch Monitor 1 each**
	ALL in one Medical Grade Monitor capable of displaying: • 3D in 4K resolution • 2D in 4K resolution • 2D in Full HD resolution • 3D in Full HD resolution Should be supplied with 3D glasses – 10 Nos Certified to: ANSI/AAMI ES60601-1:2005, UL 60601-1, CAN/CSA C22.2 NO.60601-1:14 und EN 60601-1. CE label according to MDD, class I.
3.	**LED Light source with ICG facilityincluding Fiber optic cable**
	Should have Lumen >2000 Lamp life of approx. 30,000 hrs. 4.8mm Fiber Optic Cable and 300cm Long – Two No. Should have touch display which provides an intuitive & user-friendly interface that directly displays relevant data. Lamp type: High-performance LEDs, white light LED and near infrared LED, which are active individually or simultaneously. Certified To: - IEC 601-1 & UL 544 CE According to MDD, protection class 1/CF
4.	**IMAGE/VIDEO RECORDING, DATA ARCHIVING, SIGNAL MANAGEMENT & STREAMING**
	➢ Medical grade documentation unit with CE. ➢ Controllable via Touch screen of size 10” or more. ➢ Capture video & images in 4K, UHD, Full HD, 3D & audio files. ➢ Internal storage of 2TB & more. ➢ Should have minimum of 8 inputs and 8 outputs. ➢ All inputs and outputs should be capable of routing 4K,3D and Full HD signals in native resolution. ➢ USB support for storage on USB drives. ➢ Supports network storage on file servers. ➢ Offer two channel simultaneous recording for still images & videos. ➢ Shall have HL7 connectivity. ➢ Shall have DICOM connectivity.

	➢ WHO certified Patient Safety Checklist. ➢ Surgical video & image unicast streaming in Full High Definition (1920 X 1080) over local area network to multiple participants. ➢ Offer Bi-directional video transmission & bi-directional audio transmission over LAN. ➢ Streaming picture with telestration and controllable to all participants.
5.	**4K Camera Head**
	Technical Specifications: Pixel: 3840 X 2160 Pixels AGC: Microprocessor controlled Lens: Integrated Zoom Lens f = 19 mm Color Space BT.2020 emulation Control buttons: 3 (2 of them freely programmable). Camera Head Should be able to perform both White light and Near Infrared application.
6	TELESCOPES for 2D
	Telescopes with the 4K system should be quoted with Dimensions as below for White light and Near Infrared application (ICG). 10mm, 0 Degree &30 Degree with 300mm or more working Length – 1 Each. 5MM,30 Degree with 290 mm or more working Length – 1 QTY. Telescope, diameter 10 mm, length 32 cm, autoclavable, variable direction of view from 0° – 120°, adjustment knob for selecting the desired direction of view, fiber optic light transmission incorporated.
7	**Telescopes for 3D in 4K resolution with integrated camera head**
	3D imaging via two distal 4K sensors Camera and Telescopes should be one piece 10mm 30 degrees - 1 No. Switching of 3D to 2D can be done. Free from Focus and Depth of Filed should be 30-200mm Autoclavable. Sterilization tray for the scope should be quoted. 3D Should be able to perform both White light and Near Infrared application.
8. Electronic CO_2 Insufflator	
SPECIFICATION OF ELECTRONIC CO2 INSUFFLATOR: > Fully automatic, electronically controlled gas fill > Adjustable flow rate of minimum 50 liter per minute or more and pressure range adjustable between 0 to 30 mm Hg > Optical and acoustic warning signals in case of malfunction or excessive pressure with automatic release of over pressure by back flow > Selective connection to medical gas pipeline as well as direct connection to high pressure CO2 cylinder should be available > Control by keys on front panel > Clear and adjacent front display of actual and preset flow rate, actual and preset pressure, gas consumed. > Facility for preheating of gas should be available with either internal or external heating device to avoid liquid CO2 entering into system and to maintain good adiabatic change of liquid Co2 into gas. > Should have standalone smoke evacuation system that should be connected evacuation system of OT. > Memory for retention of previous pressure settings > Should include pin-index connection to small/big gas cylinder with regulator, high pressure hose, mains cord, universal wrench and gas filter. > It should be supplied with connector & adaptor to connect to central CO2 gas supply within OT. > It should be supplied with 10 Nos of silicon patient tube.	
9. Smoke Evacuation System	
The system should be compact and complements the existing product range for endoscopic interventions. The system should provide excellent visibility through effective smoke evacuation and extracts unpleasant odors. Should include a footswitch to provide surgical smoke evacuation for standalone activation during Laparoscopy surgery Electrosurgical Integration Compatibility: Automatic activation via ESU footswitch of advanced ESUs Should be compatible with Insufflators ranging from 20L to 50L flow capacity Should have parallel suction and smoke evacuation facilities Multi-specialty usage & compatibility for urology shaver system The system should be operated via separate foot switch. Technical specification: Power Supply: 100-240VAC Power Frequency: 50/60HZ. Power consumption: 30W System should be supplied with all accessories.	

10. VIDEO CART FOR LAPAROSCOPY

Basic Video cart, rides on 4 antistatic dual wheels, 2 equipped with locking brakes, 3 fixed shelf's, one with handles, main switch at vertical beam.
Drawer unit with lock, 3 horizontal cable conduits, one with cable winding, two with 4- times Electrical sub-distributer, 1 set of non- sliding stands for units, 1 TFT- Monitor arm (VESA 75/100.

1 camera holder, 8 power cords (50cm),1 power cord (2m), 2 equipment rails, 1 CO2- bottle holder, max. diameter 155mm, Isolation transformer 230VAC (50/60Hz) with 8 sockets and earth potential and Earth leakage monitor (2000VA), Dimensions: Video cart 730 x 1470 x 716mm (W x H x D), shelf: 630 x 480 mm (W x D), caster diameter: 150 mm.
Should have the option of upgrading with Swivel Arm on both the sides for secondary Monitors
Video cart should of same OEM

2: Flexible Upper and Lower G.I. Scopy Set

TechnicalSpecification:

A. 4KHDMultiLED VideoProcessor

1. ItshouldhavedualportfortheconnectionofbothCCDandCMOStype endoscopes from same manufacturer.
2. Itshouldbeequippedwithaminimumof5LEDsallowingabrilliant illumination.
3. Itshouldhavetheabilitytoprovideacrispyfrozenimagewiththeimage freeze function.
4. It should be equipped with 7" touch screen front panel. The screen should be customizable by defining buttons for individual user profiles.
5. It should have brightness control system Auto (Average/Peak) and Manual ±5 Step adjustment.
6. ItshouldhavecolorcorrectionRed/Blue±5Stepadjustment.
7. Itshouldhavefacilityfor2xUSBportonfrontandrear panel.
8. ItshouldhavePorttosupport4KHDimageoutputsuch12G-SDIwhich should support Resolution min up to 3840 X 2160.
9. ItshouldhaveDigitaloutputDVI,3G-SDI,HD-SDIfor1920x1080/60along with analogue output Y/C and digital input DVI.
10. Itshouldalsohaveafacilityofinternal memory.
11. It should have Auto-HDR facility to deliver a bright image from the near view to far view and minimizes noise and halation at the same time.
12. ItshouldfacilitateDICOM/PACScompatibility.
13. It shouldhavePIPfeaturein processor.
14. The processor should have compatibility with existing available High-end GI, Pulmonology, EUS, EBUS scopes along with future generation seriesofscopes from same manufacturer.
15. It should have latest Digital & Optical image enhanced endoscopy features both I-SCAN and OE.
16. ItshouldhaveTwinmodetodisplay1:1imagebetweenWLEandImage enhanced endoscopy image.
17. It should have Internal and External Image and Video (mp4) recording feature.

B. HDVIDEOGASTROSCOPE

1. ItshouldhaveHD+Image Output.
2. Itshouldhaveawaterproofone-touch connector.
3. ItshouldhaveField of View 140Degreeor more.
4. ItshouldhaveDepthoffield3-100mmormore.
5. ItshouldhaveTipDeflectionUp:210°Down:120°,Right:120°&Left:120°
6. InsertionTubeDiametershouldbe9.8mmorless.
7. MinimumInstrumentchannelshouldbe3.2mmormore.
8. ItshouldhaveWorkinglengthof1050mmapproximatelyor more.
9. Totallengthapprox.1360mm ormore
10. Itshouldhavewaterjetsystemforadvancedtherapeutic procedures.
11. ItshouldhavearotatablePVEConnectorby180 degreestoavoiddamageto LG Cable.

C. HDVIDEO COLONOSCOPE

1. ItshouldhaveHD+Image Output.
2. Itshouldhavewaterproof one-touchconnector.
3. ItshouldhaveField of View 140Degreeor more.
4. ItshouldhaveDepthoffield3-100mmormore.
5. ItshouldhaveTipDeflectionUp:180°Down:180°,Right:160°&Left:160°
6. InsertionTubeDiametershouldbe11.6mmorless.
7. MinimumInstrumentchannelshouldbe3.8mmor more.

8. Itshouldhaveworkinglengthof1700mmapproximatelyormore.
9. Totallengthapprox.2050mmormore
10. Itshouldhavewaterjetsystemforadvancedtherapeuticprocedures.
11. ItshouldhavegraduatedflexibilityGDFfeature-i-FlexandTrueTorque.
12. It should have a rotatable PVE Connector by 180 degrees to avoid damage to LG Cable.

D. HDVIDEODUODENOSCOPE

1. ItshouldhaveHD+Image Output.
2. Itshouldhaveawaterproofone-touch connector.
3. ItshouldhaveField ofView100Degree or more.
4. itshouldhavedirectionofview102°(retroflexedview12°)
5. ItshouldhaveDepthoffield4-60mmormore.
6. ItshouldhaveTipDeflectionUp:120°Down:90°,Right:105°&Left: 90°
7. InsertionTubeDiametershouldbe11.6mmorless.
8. MinimumInstrumentchannelshouldbe4.2mmormore.
9. Itshouldhaveworkinglengthof1250mmapproximatelyormore.
10. Totallengthapprox.2050mmormore
11. Itshouldhavecompatiblereusabledetachabledistalendcap.
12. It should have a rotatable PVE Connector by 180 degrees to avoid damage to LG Cable.

E. 27”ormore4KMedicalGrade Monitor
F. HDRecording Software
G. Trolley
H. LeakageTester
I: Operative Environment:
Ambient temperature 10 to 40°C
Relative humidity 30 to 85%
Air pressure 700 to 1,060hPa

3: Hand Instruments for Open Surgery

Open Hand Instrument

Sl. No.	Name of the Instruments	Qty.
1	Sponge Holder <Foresters Sponge holder	08
	<Rampley Sponge holder	08
2	Towel Clip	20
3	Curved Artery forceps (M)	24
4	Straight Artery forceps (M)	24
5	Kelly's Curved Artery (L)	24
6	Allis tissue forceps (M), (S)	24
7	Allis tissue forceps (S)	24
8	Babcock forceps	24
9	Kocher's Clamp Curved (M)	24
10	Kocher 's Clamp Straight (M)	08
11	Right Angle (Fine) (M)	08
12	Right Angle (Fine) (L)	08
13	Right Angle Blunt (M)	08
14	Right Angle Blunt (L)	08
15	Right Angle (Blunt) (S)	08
16	Right Angle (Fine) (S)	08
17	Langanbeck + Right Angle (straight) (L)	08
18	Right Angle Blunt (M) (Langanbeck)	08
19	Right Angle Blunt (S) (Langanbeck)	08
20	Cat's Paw Retractor	08
21	Czerny 's Retractor	08
22	Straight Intestinal Clamp	08
23	Curved Intestinal Clamp	08
24	Small Curved Intestinal Clamp	08
25	Abdominal Retractor (Deaver's Rectractor (Long)	08
26	Deaver Rectractor (Small)	08
27	Doyen 's Rectractor	08
28	Suction Tip	04
29	Payr's Clamp	04
30	Mostoid Rectractor(M)	08

31	Mostoid Rectractor(S)	08
32	Mosquito Straight(M) baby mosquito	24
33	Mosquito Curved(M) baby mosquito	24
34	Needle Holder (M) (TC)	08
35	Needle Holder (L)(TC)	08
36	Needle Holder (S)(TC)	08
37	B.P Handle (No.03,04&07)	08
38	Debeky forceps (curved)	08
39	Vascular Forceps (Straight)	08
40	Long Fine tooth forceps	08
41	Small Fine tooth forceps (Hy pospedias forceps)	08
42	Long Plain Forceps	08
43	Small Plain Forceps	08
44	Scissor Straight (M)	08
45	Scissor Straight (L)	08
46	Scissor Straight (S)	08
47	Scissor Curved (L)	08
48	Scissor Curved (M)	08
49	Scissor Curved (S)	08
50	Scissor (Small) Hypospedias	08
51	Straight Artery (Long)	08
52	Duhamel Clamp	08
53	Perforator for Burr hole	08
54	Paediatric Tendular Tunneller	04
55	Desiiardin's Stone holding (M)	08
56	Finochietto Retractor (L)	08
57	Finochietto Retractor (M)	08
58	Finochietto Retractor (S)	08
59	Lang's Retractor's	08
60	Liver Retractor-1	08
61	Kidney Tray (L)	16
62	Kidney Tray (M)	16
63	Kidney Tray (S)	16
64	Prep Tray- Sponge holder, tray, bowl (JellyPot)	08
65	Hanger(Instrument hanger)	04
66	Drum (M)	06
67	Drum (S)	06
68	Instrument Trolly (L)	06
69	Instrument Trolly (S)	06

70	Laparoscopic Instrument Trolly	02
71	Nathanson Liver Retractor	02
72	Dennis Browne retractor	04
73	Lone star retractor	04
74	Benson 's Pyloric Spreader	04
75	Bull dog (curve) st	16
76	Satinski Clamp	08
77	Cusco's speculum (Pediatric)	08
78	SPL Trocar conneula (Pediatric)	08
79	Malleable Retractor-wide	08
80	Malleable Retractor-Narrow	08
81	UB stone holding forceps	08
82	Cheatle Forceps	12
83	Cheatle Forceps Jar	12
84	Moynihan Stomach Clamp	08
85	Iris Scissor	08

4: OT Light & OT Table

OT LIGHT

1. The OT Light should be of latest LED lens technology and consist of 1 Major Dome and 1 Minor Domes.
2. The Light should allow a homogeneous light field with maximum shadow dilution and highest degree of brilliance and color rendition.
3. The Light housing should provide for high hygiene levels by providing a closed housing with smooth contours, rounded edges without any visible screw connections to
   ensure optimum wiping disinfection
4. The system should have the following controls integrated in the control keypad

- Light field adjustment
- ON/OFF
- Variable color changes
- Brightness control

5. The light should not have any moving parts for adjusting the light field diameter ensuring less maintenance,
6. The light should have an illuminance of 160,000 lux for major dome and 130000 lux for each of the minor domes, at a distance of 1 meter
7. Color temperature Should be Variable between 3,600 K - 4,300 K - 4,600K in all domes.
8. The Domes should have light field diameter between 160/ 170 to 220/230 mm.
9. The domes should have Color rendering index of 95
10. Illumination Depth should be more than 750mm in both major and minor dome.
11. The luminous efficiency of the lights should be approximately 320 lm/w in the major and minor domes
12. The light should be dimmable from 30-100% and be a very dim light of 5% during Endo Mode in major and minor domes.
13. The Working range should be around 670mm to 1400mm or more in major and minor domes
14. Average LED life > 40,000 h
15. Primary power requirement 55 VA + 55 VA
16. The Electronic system of the light should confirm to VDE and IEC
17. Should have a Protection class acc. to IEC 601 and should confirm to CE or US FDA

HD Camera For OT Light

1. The Camera should be High dimension and have full HD video Output.

2. The Camera Should be Mounted in the centre of the dome.
3. The camera should have facility for zoom - 120 x zoom (10 x optical / 12 x digital)
4. The Camera should have convenient control of all camera functions via a separate control unit.
5. There should be Video signal and control signal interface via combination wall socket.
6. There should be HD –DSI digital video signal via BNC socket.
7. There should be Control signals via multiple DIN socket.
8. There should be no image interference caused by electro-surgery.
9. The Camera & Monitor Arm Should be of the same manufacturer as of the O.T. Light.

Technical Data

Image sensor	1/3" CMOS
Number of pixels	1920 x 1080i
Effective pixel number	approx. 2,000,000
Signal system	Standard: 1080i / 50 Hz Optional: 1080i / 59.94 Hz 720p / 50 Hz, 720p / 59.94 Hz
Aspect (height-to-width) ratio	16:9
Minimum illumination	12 lx
Signal-to-noise ratio (SNR)	>50 dB
Zoom	10x optical / 12 x digital
Focal length (zoom lens)	f = 5.1 mm to 51 mm
Shutter	½ to 1/10,000" S
White balance	Automatic
Ambient temperature	0 ºC – 45 ºC (32 ºF – 113 ºF)
Ambient temperature during operation	0 ºC – 45 ºC (32 ºF – 113 ºF)
Power requirements: control unit / camera	100-240 V, 50/60 Hz / 24 AC / DC
Protection class	I
Type	B
Protective conductor (PE) terminal	Yes
Power input: control unit / camera	max. 24 W / approx. 6 W
Camera dimensions	131 x 88 mm (length x diameter)
Weight of camera installed in light head	Approx. 1 Kg.
Weight of camera mounted on separate arm	Approx. 0.8 Kg.
Dimensions of control unit (complete)	270 x 120 x 20 mm (W x H x D)
Weight of control unit	Approx. 2 Kgs.
Mark of conformity	CE
Wall socket connector standard	3 x BNC socket for video signal 1 x multiple DIN socket for control signals
Resolution	1920 x 1080 pixels

Specification Of the Monitor

The Monitor should be LED HD Medical Grade Monitor (Approx. 21") and should be mounted on the 4th arm of the OT Light. (If Height is a constraint, then the third dome & monitor arm may be fixed on a separate ceiling plate)

Technical Specification for Operating Table

Tender Technical Specification Of Operating Table :
The table top should be 100% radiolucent material & X-Ray access.
5 sections table plate
The OT Table should be Electro-Hydraulically operated.
Lifting capacity of OT Table should be 230 Kg and Safe working load should be 185 Kg.
The thick of the mattress should be more than 75 mm
It should be have 2 control models including remote panel and backup panel.
It should have a battery inside the table, which can work 50-80 operations for two weeks and the battery should be standard configuration.
The rails & the column of the table should be made of high level of Stainless Steel.
Length of the table ≥2060 mm
Width of the table with rails ≥590 mm
The thickness of mattress ≥ 75 mm
Electro-Hydraulic Functions :
The lowest position ≤ 720 mm

The highest position ≥ 1070 mm
Turn left ≥ 25°
Turn right ≥ 25°
Trendelendburg position ≥ 30°
Reverse Trendelendburg position ≥ 30°
Back plate up position ≥ 80°
Back plate down position ≥ 40°
Flex position ≥220°
Re-flex position ≥ 110°
"0"position by one electric button
Mechanical Function
Head plate up ≥ 45°
Head plate down ≥ 90°
Leg plate up ≥ 20°
Leg plate down ≥ 90°
Leg plates spread ≥ 180°
Standard Accessories for General Surgery Deptt. :
A pair of arm boards with clamps & bands, and it has the universal coupling for up & down & rotary function.
Anesthesia frame with clamp – 1 No.
A pair of leg Plate with clamp, pad, and it has the universal coupling for up & down
1 Body strap with Velcro
Separate Price has to be Offered for below Functions / Accessories :
Built-in Body Elevator of 120 mm
Electric-Hydraulic longitudinal shift function not less than 300 mm
Lithotomy Pole with Clamp – 1 Pair
Shoulder Support – 1 Pair
Double Layer Arm support with Clamp – 1 No.
Pubis Body support with pad & clamp – 1 No.
Sacrum Body support with pad & clamp – 1 No.
The OT Table should be US FDA listed and European CE approved.

5: Image Intensifier

Image Intensifier

Microprocessor controlled C-arm machine with FPD should provides the excellent image quality at low radiation, ideally suited for general surgeries in many application fields and special application such as orthopedics, urology, Gastroenterology, pain management, Spine fixation, Neurology & angiography procedures.

A) FLAT PANEL DETETCOR:

- Receptor Type should be of Amorphous Silicon technology
- Conversion Screen should be of CsI
- FPD with 30 x 30Cm or more size should be provided
- Image Matrix should be 1.5K x 1.5K or more
- Pixel pitch should be 150µm or less.
- ADC conversion should be 16bit or more
- Limiting resolution should be 2.5lp/mm or more
- Suitable Carbon fiber grid should be provided

B) Monitor on Trolley:-

1 No 32" or more colored display monitor with split screen for Live & Reference Image display mounted on trolley should be provided.

C) Monitor on C-carriage:-

13" or more Touch screen console mounted on C-carriage to operate the machine & for live Image display.

D) C-ARM MOVEMENTS: Fully counter balanced all movements

1. Rotation: ±180 Degrees.

2. Motorized Up/down: 400mm or more
3. Horizontal Travel: 200 mm or more
4. Arc Orbital Movement: 120 Degrees.
5. Wig Wag: ±12.5 Degrees.
6. Source to Image distance should be 970mm.
7. Depth of "C" should be at least 650mm
8. Free space should be 750mm or more
9. Steering handle with +/-90 degree movement for both side diagonal scan.

E) <u>X-RAY GENERATOR:</u>

35) High Frequency (50 KHz).
36) Output power should be 15KW or more.
37) Fluoro & Rad. Kv 40 to 120 KV.
38) Digital Spot: 150mA
39) Pulse Fluoroscopic mA(peak):-
    - up to 15mA or more (Normal Mode)
    - up to 30mA or more (boost flouro mode)

F) X-RAY TUBE:

- Monoblock tube head having dual focus Rotating anode X-Ray tube of focal spot 0.3mm (small focus) & large focus (0.6mm) should be provided.
- Anode Heat Storage capacity should be min 365kHU
- Long/cross parallel shutters for square / rectangular collimation with preview

G) <u>CONTROL:</u> Control should have the following function & indication:

Touch screen monitor mounted on C-arm carriage for Image & Exposure parameters control is provided with following functions and indications:-

On GUI Screen

- Fluoro and Radio mode selection.
- Image rotation & Flip
- Fluoroscopy timer (Five minute cumulative timer with buzzer that activates after the completion of 300 seconds of exposure to reinitiate the exposure *reset* switch is provided).
- ABS (Automatic brightness stabilization) selection for hand free operation- also known as ADR
- KV and mAs increase and decrease switches.
- X-Ray ON indicator.
- Collimator open/close switches
- Image transfer from live view to reference view

Others

- Switches for up/down movement of "C" on both side of machine frame.
- Emergency OFF switches mounted on monitor.
- Machine ON/OFF Key switch.
- Flouro, Cine & spot switches on both side of panel

H) <u>MEMORY SYSTEM</u> should include the following: -

- Image processing software with real time image capturing, storage, and display in 1.5kX1.5k format.
- Boosted fluoroscopy (CINE) at 30 FPS with real time recording on hard disk drive.
- Digital Radiography (SPOT) exposure mode is available
- Variable Frame Rate(1-30) FPS

User selectable view on Single monitor.

- User selectable image display for Live & Reference view

DSA:-

- Up to 10 FPS image acquisition for DSA
- R-Mask
- Land marking (%age based)
- Pixel Shift

Roadmap:

- Real time path map
- Roadmap clear

- Peak Hold

Image Processing:

- Real time noise with reduction with Averaging up-to 16
- Recursive filter for image smoothing, DRC, Contrast, Brightness, Sharpness.
- Interactive Zoom and Pan
- Dynamic Zoom up to 400%
- Pre-programming for image setting for different operating Modes
- Image Inversion
- Dynamic Noise Reduction Filter(DNF) for moving anatomy.
- WW/WL level adjustments
- Image Flipping and Image Rotation Clockwise or Anti-clockwise.
- Live to Reference View on Single Monitor
- Cine Loop Play(Auto and Frame wise)
- Real time Image Flip(Horizontal/Vertical)

DAP Module:

- DAP dose integrated in software and total summary for Fluoro/Cine Saved.
- Real Time Patient dose monitoring display with overdose warning message

MAG:-

- Real Time Three step Digital MAG.

Touch monitor :

- Touch based console for frequently used parameters along with image display.

DICOM Features

- Connectivity with DICOM workstation/PACS
- DICOM Send/Storage Commitment
- DICOM Print
- DICOM Worklist/MPPS

Storage:

- Upto 780 GB Hard disk for storing images
- Fluoro saving as per user need
- LIH saving as per user need

Annotation:

- Rectangle, Ellipse, Line, Text

Measurement:

- Stenosis measurement, Length Measurement

PACS Connectivity

- Multiple Nodes can be configured.
- Single/Multiple Image Tagging to transfer into PACS/Workstation

Miscellaneous

- Exposure Lock/Un-Lock facility
- Electronic Collimator
- Paper Printing
- Different format of image saving like JPG, BMP, TIF, PNG , AVI Loop
- Cine loop play
- Image Data Export to DICOM CD
- Mosaic view/Image layout 2x2, 3x3, 4x4.
- Wireless remote for software features like Image Flip/ Rotation etc.

I) <u>Power requirement:</u>

- The unit should be operable on Single Phase 230 V ± 10% AC, 50 Hz
- UPS for entire machine/complete system with 15min back up.

J) <u>OTHER REQUIREMENTS:</u>

- The company should be ISO & ICMED certified company.
- The quoted model should be USFDA approved
- The unit should be approved by AERB.
- The company should have a Service center in State.
- The company should have proven track record in Govt. sector.

- The X-ray generator, flat panel detector and image acquisition software should be from OEM of the equipment with model of the detector should be mentioned on it.

6: Ventilator

1. Microprocessor control, time-cycled, volume&pressure-controlledwithadaptive ventilationfor use in intensive care, suitable for ventilating all categories of patients from premature neonatal (400-gram BW) to adults.
2. Should have adynamic Lung View tovisualize assessment for compliance, resistance, obstructive and spontaneousbreathing indication
3. Ventilator should be supplied with inbuilt turbine or external medical grade compressor.
4. The compressor (if applicable) should be of same make as that of ventilator.
5. The ventilator &compressor (if applicable) should be US FDA and European CE approved.
6. Integrated display should be of 13inchcolorfull touchscreen.
7. Ventilator should have High Flow Oxygen Therapy.
8. Ventilator should have volumetric ETCO2 measurement
9. Ventilator should have transpulmonary pressure measurement & monitoring option to titrate PEEP for Open Lung in acute care
10. Ventilator Should have SPO2 measurement option.
11. Should have following modes of ventilation -
    a. Volume control – VC / PCin CMV
    b. Assist control – VC / PC
    c. Pressure control SIMVPRVC
    d. CPAP with Pressure Support
    e. Volume Support in PSV
    f. ASV/AVM or equivalent
    g. SIMV (Volume Control / Pressure Control) with Pressure support
    h. BIPAP /BIVENT/BELEVELor equivalent
    i. Target vent modes such as PRVC / Auto Flow / PAV/ APV for automatic adjustment of pressure
    j. Apnea backup ventilation mode with adjustable settings option.
    k. Separate independent NIV Mode (On/Off option on invasive mode is not acceptable)with automatic leakage compensation at least >100LPM
    l. nCPAP with burst backup to prevent apnea
12. Should have following parameters-
    a. Tidal Volume in Volume mode:2 to 2000 ml
    b. Inspiratory Pressure: 1 – 80cmH2O
    c. CPAP/PEEP /Intermittent PEEP: 0 – 50 cmH2O
    d. Inspiratory Rate: 2 – 150 bpm
    e. High Frequency nIPPV Rate – up to 200bpm
    f. Inspiratory Time: 0.1 – 10 sec
    g. Pressure support: 0 – 60 cmH2O above PEEP
    h. FiO2: 21 - 100%
    i. Flow trigger and Pressure Trigger
    j. Peak Inspiratory Flow should be at least240 LPM or above
    k. Should have facility for Manual Breath, Inspiratory Hold, and Expiratory Hold.
    l. Should be able to measure Intrinsic PEEP, NIF
    m. Should have display of weaning parameter like RSBI, Expiratory Time Constant, WOBi etc.
13. It should display breath to breath measured values for Tidal Volume, Minute Volume, Spontaneous Frequency, FiO2, Peak/Mean Pressures, PEEP, Plateau, Resistance, Compliance etc.
14. It should have three level alarm management with different audio-visual color-coded alarms.
15. Should have inbuilt battery back-up for at least 3 hr for Ventilator and inbuilt air source in the event of power failure.
16. It should have simultaneous display of minimum 3 waveform along with 2 loops
17. Screen should display following waveforms:
    a. Flow – time,
    b. Pressure – time,
    c. Volume – time
    d. ASV/AVM Minute ventilation Graph
    e. And following loops:
        i. Pressure – volume,
        ii. Flow – volume,
18. Ventilator should have inbuilt Fio2 Monitoring.

19. The flow sensor should be Hot Air Anemometer or Variable Orifice Differential Pressure type.
20. Should have reusable expiration cassette /valves for complete disinfection capability.
21. Should have an inspiration synchronized inbuilt volume compensated nebulizer
22. Should have facility for ventilation data transfer via USB port and RS232 port
23. Scope of supply should include followingwith each ventilator-
    a. Modular corrosion free ventilator Cart/ Trolley with circuit holding arm from same source.
    b. Heated humidifier with reusable breathing circuit
    c. Oxygen connecting Hose and Air connecting Hose (if needed) – 1pc each
    d. Test Lung and Instruction Manual

7: Forced Air Warming Machine

1. Should be a light weight portable system
2. Should have minimum four variable temp settings (Range 35 to 42°C approx)
3. Should have hose disconnection alarm/indicator
4. Should have digital display of temp at end of hose pipe.
5. Should have quiet operation.
6. Should have display for elapsed time.
7. Should have air filter.
8. Should have full body adult and paediatric blankets
   Adult - 10
   Paediatric- 05
9. Should have CE or any other International certification of quality

8: Vessel Sealer Energy Source

The unit should have the following features:

- The unit should have a large LCD display to show the various settings.
- The unit should have an optical support quickstep control knob/touch Key/screen button to achieve and make the settings of the unit quickly.
- It should have a memory of minimal 99 individual programmes for various types of surgeries and with preference for various surgeons.
- It should have a possibility to give names (procedures/surgeons name) to the individual programmes.
- It should have Neonatal safety and defibrillator indicator with patient monitoring system
- Should have a special output for vessel sealing up to 7mm of vessel in both open surgery mode and endoscopic surgery mode.
- The vessel sealing clamp forceps should be 100 % reusable and both straight & curved of different lengths.
- Should have reusable Laparoscopic Vessel Sealing Instrument with Integrated Blade
- Should have both monopolar and bipolar cut and coagulation outputs.
- The unit should have four individual outputs 2 for monopolar, 2 for bipolar and 1vessel sealing
- The unit should have 11 different monopolar cutting currents with different cutting qualities and capabilities.
- The Monopolar coagulation should be with Auto-Start and Auto-Stop.
- The Bipolar should have a special cutting current with simultaneous coagulation during the use of bipolar scissors.
- The following different current modes should be available:
  - Monopolar cut modes (minimum 8 types)
  - Care cut (for precise cutting in micro surgery)
  - Argon cut mode (special cutting mode for use with argon plasma)
  - Monopolar coagulation modes (minimum 15 types)
  - Bipolar cutting mode (minimum 3 types)
  - Bipolar coagulation (minimum 6 types)
  - Vessel sealing mode
  - Endo mode

The following accessories should be supplied with the unit:

- Footswitch single & double pedal
- Twin patient plate
- Vessel sealing for open surgery with integrated blade (autoclavable)/ single use minimum of 10 each
- Bipolar for laproscopic maryland type
- Bipolar forceps for open surgery
- Bipolar cable
- Monopolar diathermy accessories for open surgery

- Monopolar diathermy accessories for lap surgery
- Reusable vessel sealing for lap surgery straight & fenestrated jaw with integrated blade (autoclavable)/ single use minimum of 10 each
- Unit should be supply with cart
- All the accessories from same manufacturer

Should be European CE/FDA certified

9: Plasma Steriliser

1. Size should be minimum of 110 ltrs and above.
2. It should have state – of – art Hydrgen peroxide Gas & Plasma Technology (Plasma should be generated inside the chamber).
3. It should have Rapid Warm - up system.
4. It should have preprogrammed cycles with cycle time in the range of 35 – 55 mins with separate cycle for lumen / flexible endoscope load
5. It should have Cassette type sterilant (min 4 to 7 cycles per cassette).
6. It should have 3 programmed cycles, Short, Standard & Advanced depending upon the types of products sterizing. Having min cycle time of 35 mins.
7. It should have parameters (Temperature, Pressure, Cycle time, Daily cycle, Total cycle, Sterilant remaining cycle, etc).
8. Should have Barcode or RFID information in case of sterilant use.
9. Should maintain sterilization cycle temp 55 deg C or less for the treatment of heat sensitive surgical instruments.
10. All lumens , non lumens ,& flexible lumens like endoscopes can be sterilized in different prog cycles.
11. It should have graphical cycle process information.
12. It should have graphical sterilant level information.
13. It should have operator log-in function.
14. It should have USB cycle data backup/Ethernet connection. With 10" TFT touch LCD color screen.
15. It should have Electric plug only.
16. It should have chamber heater mounted on four sides.
17. PM (Preventive Maintenance) alarm.
18. Lockable caster for mobile.
19. It should have Vertical sliding door (dual safety system.)
20. It should have No water, vent. Plumbing facilities required.
21. It should have Cycle cancel function.
22. It should have Door foot switch sensor.
23. It should have 2- tiered shelves chamber (Load Wt. / shelf : 40 kg)
24. It should have environment friendly, No toxic by-products and harmful residues
25. It should have Visual and Audible Alarms.
26. It should have No boosters and endoscope adaptors required.
27. It should have Hydrogen peroxide Gas & Plasma Technology.
28. It should have self diagnose function. With cracking of plasma (generated inside chamber).
29. It should have SAL : 16 – 16 & international with safety standardization.
30. Should have performance certificate of minimum of 5 (five) Indian users.
31. The sterilizer should have approval / validation claims from the leading medical reputed device manufacturers that their instrument can be reliable cleaned and sterilized and is therefore safe to reuse (compatibility) as per the international standard guideline EIN ISO 17664 and AMMI TIR1 2 specifying the sterilization process and cycles in their IFU for sterilization of telescopes, cameras 7 other surgical instruments.
32. All daily use consumables to be quoted separately as follows :-

S/ No.	Item Name	Qty. quoted
I	Sterilant : Cassette	1
Ii	Chemical Indication tape	1
Iii	Chemical Indicator strips	1
Iv	Biological Indicator per vial	1
V	Trays with Silicon mats : / basket (ss)	
	a. 24 x 8 x 2 inches	1
	b. 18 x 4 x 2	1
	c. 10 x 6 x 2.25	1
Vi	Endoscope holders 5 mm and 10 mm	1
Vii	Sealing Machine	1
Viii	Sealing Material tyvac Rolls :	1

	a. 16” (40 cm)	1
	b. 14” (35 cm)	1
	c. 10” (25 cm)	1
System must be : US FDA & European CE		

Group-G: Patholgy

1. Fully Automated, Immunohistochemistry Staining System

- The system must be walking away fully Automated Slide Staining System to process slides for Immunohistochemistry (IHC), In Situ Hybridization, Immuno Fluorescence.
- System should have the capacity to run at least 30 slides at a time
- Should have Automated IHC/ISH platform which manages immediate requests with no impact on ongoing processing of slides.
- The system must be fully automated to do antigen retrieval and staining within the same system.
- The System should be open for Primary antibodies.
- It should be able to do test as well as control on same slide without any extra consumption of reagents.
- The system should have fast turnaround time (not more than 3.5 hours)
- The system should have total tissue care for frozen, bone marrow and fatty tissue
- Should have a Slide Labeling System, Barcode/QR code reader, Printer and facility of LIS connectivity
- Only less than 150microliterofPrimaryantibodymustberequiredtocoverthewholeslide, irrespective of the size and number of the tissue sections on the slide
- A single slide run should not consume more reagents per test compared to when run in batches with other slides.
- System should have a facility to control multiple staining systems in single control system to enable sharing of reagents and protocols across multiple instruments.
- The system should be USFDA certified/Indian Standard.
- The installation and training should be done free of cost.
- The system should have compatible computer and software of latest technology available during installation. The software should be upgradable free of cost.
- A suitable on line UPS and battery backup sufficient to cover power outage of 60minutes should be provided
- The system or any variants of the system with the same technology should be installed in minimum 10 Hospitals Labs across India in both Govt and Private sectors.
- Technical support should be available for trouble shooting with a maximum response time of 48 hours
- Price of all consumables including buffers, reagents, amplification kits, and reagents necessary for working or servicing/cleaning of machine antibodies, any consumable machine parts should be quoted.
- Consumable prices should be fixed for Ten years by mean so far ate contract.
- The hidden cost of all the items that are required but not provided with the equipment should be elaborated.

2. Real Time PCR Specification

- System should run real-time PCR experiments without being attached to a computer. When operated as a stand-alone instrument, the instrument will save at least 1000 run files.
- Real-time data traces can be viewed during a run from the thermal cycler screen.
- System includes an automated lid that opens, closes, and can apply sealing force to reaction wells.
- System must not have lid or drawer that extends beyond the footprint of the system nor requires additional operating clearance.
- System can detect a 1.3-fold change in gene expression.
- Thermal gradient for optimization of multiple temperatures in a single assay. Temperature differences of up to 24°C front-to-back can be created.
- Peltier-driven thermal cycler with maximum ramping speed of 5°C/sec, with an average ramp rate of 3.3°C/sec.
- Should have a thermal block operational range of 4–100°C.
- Sample block temperature accuracy is +/-0.2°C of programmed target at 90°C, with a uniformity of +/-0.3°C well-to-well within 10 seconds of arrival at 90°C.
- Optical system allows excitation and detection of up to five fluorescent dyes in a single reaction well.
- Optics independently illuminates and detects fluorescence from each well with the same LED/detector pair per channel. The system should have six filtered LEDs for illumination and differentially detects emission using six filtered photodiodes (one for each channel plus FRET).
- System must have fixed optical path, directly over each well, eliminates the need to normalize for positional bias.
- Absorption spectra in the 450–684 nm; Emission spectra in the 515–730 nm range.
- One channel is dedicated for FRET and Protein Thermal Shift (Protein Melt) experiments.
- System should reads all 96 wells with all channels within 12 seconds.
- In “SYBR/FAM” scan mode, the system should read all 96 wells within 3 seconds.
- Dynamic range of 10 orders of magnitude.

- Should detects one copy of target sequence in human genomic DNA.
- Reaction volumes from 1–50 µl.
- Should detects ≤10 fmol of fluorescein.
- System can be integrated with an automation system for hands-free operation.
- System should continue to run and complete a run if the software is stopped or interrupted to prevent run data from being list in case if there is unintentional interruption of the software. This function is especially valuable for precious or limited samples, whereby all data is not lost for a run that was interrupted.
- System should directly connect to a network file storage location through Wi-Fi or ethernet with user credentials and can read and write, given system access rights.
- System should connect to cloud platform for remote monitoring, experiment set up, and Cq analysis.
- **Software specifications:**
- Multiplex amplification and melt curve and end-point analyses should be performed on up to five fluorophores in a single reaction well.
- Multiple plates should be combined into one experiment with the Gene Study Feature.
- Run results should be displayed in a customizable configuration so that multiple panes of information can be viewed in a single window.
- Multiple standard curves should be simultaneously viewed when a common fluorophore is used for multiple targets.
- PCR quantification by standard curve features automated calculations of reaction efficiencies with y-intercept.
- Automated allelic discrimination by end-point fluorescence or quantification cycle (Cq) values.
- Gene expression analysis by relative quantity (ΔCq) or normalized expression (ΔΔCq).
- Multiple reference genes Could be assigned in normalized expression (ΔΔCq) analysis.
- Software should have reference Gene Selector Tool displays gene stability for selection of ideal reference genes.
- Up to 5,000 Cq values from different data files should be compared for gene expression analysis.
- Embedded reports tool should be customizable by the user to export run information, data tables, graphs, and analysis parameters in a specified order to PDF or other file formats.
- Software should be laboratory information management system (LIMS) enabled.
- Software should be able to data to be grouped and interpret by both technical replicates and biological groups.
- Image export options must include DPI selection up too 600DPI, choice of any image size, and color selection using RGB specifications.
- Image annotation function allow for automatic p-value annotation and addition of arrows, circles, and text directly onto graph images.
- Software should performs t-tests and 1-way ANOVA calculations.
- Software should display data in multiple formats including bar chart, dot plot, box-and-whisker plot, scatter plot, clustergram, and volcano plot.
- Should control up to 4 Instruments with one PC.

3. Chemidocumentation Imaging System

- Imaging System should be stand-alone, ready to use with all essential hardware & accessories, darkroom, CCD camera, and advanced single software for image acquisition and analysis.
- System should be capable of doing applications like stain free Imaging, Chemiluminescence, Colorimetry, Fluorescence, Densitometry, Nucleic acid Documentation.
- System should have in-built 16-bit CCD (not A/D) camera with pixel density of 65,536 gray levels having individual pixel size at least 4.54 x 4.54 µm or bigger.
- Camera resolution should be 6 megapixels or higher and have a Peltier based cooling.
- The imaging system should allow users to position their samples using appropriate tray and automated image capture driven by a selected gel or blot application.
- The instrument should provide excellent quantitative data from a single blot having very intense and weak signals in a single image; to facilitate the same instrument's dynamic range should be at least 4 orders of magnitude for all applications.
- Instrument should provide highest level for sensitivity and hence must have minimal dark current with maximum limit of 0.002 e/p/s and low read noise of not more than 6e-.
- Quantum efficiency at 425 nm should be 70% or more, this will ensure that the instrument is highly sensitive to very faint signals from chemiluminescent blots.
- Motorized zoom fast lens with f/0.95 or better should be provided.
- Light sources/excitation should include – Trans-UV (302 nm), Epi White, trans-white (via White sample tray). It should come with upgradation option to include following illumination sources such as Epi-blue (460-490 nm excitation), Epi-green (520-545 nm excitation), Epi-red (625-650 nm excitation), Epi-far red (650-675 nm excitation),
- Epi-near IR (755-777 nm excitation) for multiplex fluorescence imaging in RGB, Near IR and IR.

- Instrument should have provision for protective UV shield for use during band excision with safety interlocks to avoid un-intentional UV exposure to the user.
- Minimum imaging area for white light and chemiluminescence application should be 20.5 cm x 16.5 cm.
- The imaging system should provide image acquisition with automatic zoom, focus, and iris adjustment without the need for users to focus or adjust aperture settings.
- The instrument should have onboard attached touchscreen of 12" or bigger with multi-touch capability (2 points) enabling users to easily interact with the touchscreen to acquire, assess and export images. Touchscreen actions should include – tap, double tap, pan, scroll to zoom.
- Instrument should have multiple input/output ports with minimum 3 USB ports allowing users to connect USB devices (like keyboard, mouse, data storage, and printer). One USB port should be provided on the front panel for easy export to USB. Also, system should have one Ethernet port so that users can transfer image files via Ethernet to networked computers.
- Factory calibrated flat fielding for ensuring uniform data for all applications. System should be calibrated for image area, focus, and flat field correction at the factory and files stored in the integrated PC.
- Users should be able lock the system to prevent others from interrupting/changing the settings.
- System should be supplied with a stain-free acrylamide solution kit to enable stain-free imaging of gels and blots.
- The system should have a fixed sample stage.
- The system should provide flexibility in selecting the pixel binning options, should be possible to select minimally 2x2, 4x4 and 8x8 binning.
- The system should be provided with analysis software with unrestricted user license.
- Software should have highest level of automation in hardware calibration, image optimization, capture, and analysis.
- Should have automated workflow recorded in a protocol file from image capture to results thus eliminating need for training.
- Should allow 100% repeatability of the workflow by any user and ensures optimized image analysis from a gel in a single uninterrupted, fast, and completely reproducible workflow.
- Software should have automated normalization feature for normalizing western blot signals of target band with a housekeeping protein band and total protein normalization.
- Software should be both PC and Mac compatible and freely upgradeable to future versions.
- The software should generate the publication ready images (dpi, dimension and format) with one click export option.
- Analysis software should not only generate customizable reports but also have feature for automatic print when only imaging and printing is required.
- Software should have easy copy/paste functionality, crop, zoom, 3D and colors.
- Software should perform analysis functions such as lane and band detection, background subtraction, incorporation of nucleic acid/protein standards from vendor as well as external vendors and absolute and relative band intensity determination.
- The analysis software should be capable of upgradation to 21 CFR compliant version to provide a secure environment for protocol, data acquisition and analysis.
- At least five prior installation report of the exact same model of the instrument in different universities/ institutes/ companies in India is required (should be provided with proper documentation from corresponding authority). The manufacturer should have atleast 50 installations of imaging systems in the country (user list to be provided).

4. Specification of Vertical Electrophoresis

- Vertical Electrophoresis system (8.3 X 7.3 cm)
- Should support both **Precast and handcast** gel runs.
- Cell must run 1 to 4 gels within 45 min
- Easy setup with glass plates having permanently bonded spacers
- Ensure leak free casting
- Casting frames with simple cam closure to provide precision alignment on any flat surface.
- Should be supplied with 1.0 mm & 1.5 mm (5 each) integrated spacer plates and 15 thin plates.
- Should supply with 5 combs of 1.0 1.5 mm 10 well combs (5 each)
- Modular system-upgradeable to run western blotting
- 2. Horizontal gel electrophoresis system
- Should be UV Transparent gel tray with an integrated fluorescent ruler & safety lid
- Should be having universal gel caster to fit different size of gel tray.
- Same buffer tank should accommodate different sizes of gel tray.
- Multiple options for hand casting gels of different sizes
- Combs to fit virtually every need-multichannel pipette compatible combs, fixed height combs, adjustable height combs, and preparative combs
- Easy to replace electrode cassettes

- IEC 1010(EN 61010) Electrical safety certification.
- Specifications:
- Main Unit with buffer tank with single molding casted
- UV Transparent Gel trays size 15 X 10 cm, 7X10 cm
- Suitable Gel caster,
- 8 well , 15 well and 20 well combs- 2 each
- Buffer volume: approx 650 mL.
- Power Supply: Specifications:
- Volts : 10-300 V in 1 IV steps
- Current : 0- 400mA in I mA steps
- Power : 75 W (maximum)
- Type of out put : Constant current or Constant Voltage
- Timer : 1-999 min
- Programmable
- Automatic recovery after power failure
- Pause/Resume Function
- No of out put : 4 recessed sets in parallel
- Safety features like No load detection, sudden load change detection, overload/short circuit detection, over voltage detection.
- Operating temperature: 0 – 40degree C
- Regulatory EN-61010,CE
- Easily stackable one upon other powerpack
- Display: 3 digit LED

5. Block Cabinet 25000 Capacity

- It should store large quantity of blocks in less space.
- Cabinet should be made up of good quality cold rolled steel with powder coating finish.
- The drawers should be slidable.
- Cabinets should be stackable.
- For each drawer handle is provided.
- The block storage cabinets should be stackable to accommodate increasing demand.
- The cabinet should come with lock and keys
- The cabinet must be USFDA approved
- Manufacturer must have experience of at least 30 years in Histopathology products
- Manufacturer must have supplied the similar product in at least 10 reputed institutes/ Hospitals must enclosed the PO and the performance certificate

6. Fully Automated Equipment for Liquid Based Cytology (LBC)

- LBC System which is highly effective in greatly reducing false negative results and provides increased confidence in the detection of pre-neoplastic and invasive cancer, where present
- Low Inadequate rates and consistently high PPV(Positive Predictive Values) resulting in the identification of 'true' disease
- Should ensure that 100% of the collected sample is sent to the laboratory and provides standardization in the collection process and reduces need for repeat recall and processing.
- The system should be able to work with various collection methods as spatulas, brushes etc.
- The retention of the brush head in the container eliminates the risk of any abnormal cells being discarded with the sampling device
- Should preferably use an ethanol/methanol based preservative as the collection medium
- Centrifugation process which effectively removes obscuring blood, mucus and polymorphs while still retaining the important diagnostic material.
- Should process each specimen to produce up to 8- 10 equally representative slides especially for additional testing.
- Should be capable of handling a high throughput of 40-50 slides stained per hour.
- Should be able to process multiple specimens at the same time for best laboratory efficiency.
- Should be capable of running at regular electrical requirements.
- The preservative fluid for collection of LBC samples must be non-hazardous with easy storage and transport facility.
- Should be capable of preparing thin layered slide within a standardized smear diameter from the particular sample.
- For processing of both gynaecological and nongynae samples
- Storage of samples at room temperature for about 4 weeks and in refrigerator for 6 months to allow performance of additional adjunctive tests such as HPV, if required

- Compatible with HPV Testing
- Provisions for training of laboratory personnel using LBC.
- Hidden costs of all reagents and other items not included with the machine to be quoted separately in elaborate detail.
- All labelling is completed at the start of the process with barcoding of all samples and to include additional identification details such as Name, Date of Birth etc
- All consumables and reagents are provided for sample collection and processing.
- Provision for power backup for minimum 2 hours in case of power failure.
- Staining to be included as an integral part of the system to ensure a high degree of standardization.

7. Automated Urine Chemistry Analyser

System	• Modular, analytical system platform, consolidated work area for urine strip testing and • urine microscopy, expandable and reconfigurable on site
Types of module	• urine test strip measuring unit • urine microscopy measuring unit
Module Combinations	• Stand-alone configurations: • urine analyzer • microscopy analyzer • Urine work area configuration
Sample Throughput	• Up to 240 samples/hour with test strip analysis only
Test parameters	• Urine strip analysis: • ERY Erythrocytes and • hemoglobin • LEU Leukocytes • NIT Nitrite • PRO Protein • GLU Glucose • KET Ketones • UBG Urobilinogen • BIL Bilirubin • pH • SG Specific gravity • COL Color • CLA Clarity • Urine microscopy analysis: • RBC Red blood cells • WBC White blood cells • NEC Non-squamous epithelial cells • SEC Squamous epithelial cells • YEA Yeasts • CRY Crystals • BAC Bacteria • HYA Hyaline casts • SPRM Sperm • MUC Mucus • PAT Pathological casts
Consumables	• cassette with 400 strips for urine test strip analysis: cassette with 400 cuvettes for urine microscopy analysis
Sample input/output	• Load/unload capacity: 75 samples (= 15 racks), continuous loading/unloading • Rack: 5 position rack, RD standard rack • Rack tray: tray with 15 racks/75 samples, RD standard rack tray • Automatically starts operation after routine, priority or emergency samples loading
Sample tube types	• Requisite range of diameter,. Bottom: round, conical or false
Minimal sample Volume	• Test strip and microscopy: 2.8 mL • Test strip: 2.0 mL • Microscopy: 2.0 mL • Test strip reduced volume (no SG and CLA measurements): 1.5 mL • Test strip reduced volume and microscopy: • 2.3 mL
Measurement Principles	• Reflectance photometry: with 4 different wavelengths (465, 528, 560 and 615 nm) • Refractometry: SG testing • Turbidometry: clarity testing • Automated microscopy • Automatic image evaluation

Calibration	• calibration strip for urine test strip analysis • Reference cuvette for the microscopy check
Storage capacity	• Test results: up to 10,000 sample test results (including images) • QC, photometer calibration, measuring cell calibration and microscope check: • up to 300 for each • Operator can export all results on the analyzer, including sediment images, QC and calibration results
Power Requirements	• Line voltage: 100 – 125 VAC, permanent connection (± 10 %) • 200 – 240 VAC, permanent connection (± 10 %) • Line frequency: 50 or 60 Hz (± 5 %)
Regulatory Requirements	• Urine analyzer series meet the protection requirements laid down in IVD Directive 98/79/EC. Furthermore, our instruments are manufactured and tested • according to the following international standards: • IEC 61010-1, 2nd Edition • IEC 61010-2-081, 1st Edition • IEC 61010-2-101, 1st Edition • CAN/CSA C22.2 No. 61010 2nd Edition • EN IEC 61326-1 1st Edition • EN IEC 61326-2-6 1st Edition • UL 61010-1, 2nd Edition
Operating Conditions	• Ambient room temperature 18 – 32 °C (64.4 to 90 °F) • Relative humidity 30 % – 80 %, non-condensing
Physical Dimensions	• Width (with buffers) 107.9 cm (42.48 in) • Width (without buffers) 68.7 cm (27.05 in) • Depth 53.2 cm (20.94 in) • Height 64.4 cm (25.35 in) • Urine work area (with buffers) • Width 176.6 cm (69.53 in) • Depth 53.2 cm (20.94 in) • Height 64.4 cm (25.35 in)
Weight	• With buffers 92.7 kg (207.5 lb) • Without buffers 80.5 kg (177.47 lb) • With buffers 88.8 kg (195.8 lb) • Without buffers 76.6 kg (168.9 lb) • Urine work area • With buffers 169.3 kg (373.2 lb) • Without buffers 157.1 kg (346.3 lb)

8. Automated Urine Sediment Analyser

System	• Modular, analytical system platform, consolidated work area for urine strip testing and • urine microscopy, expandable and reconfigurable on site
Types of module	• urine test strip measuring unit • urine microscopy measuring unit
Module Combinations	• Stand-alone configurations: • urine analyzer • microscopy analyzer • Urine work area configuration
Sample Throughput	• Up to 240 samples/hour with test strip analysis only
Test parameters	• Urine strip analysis: • ERY Erythrocytes and • hemoglobin • LEU Leukocytes • NIT Nitrite • PRO Protein • GLU Glucose • KET Ketones • UBG Urobilinogen • BIL Bilirubin • pH • SG Specific gravity • COL Color • CLA Clarity • Urine microscopy analysis: • RBC Red blood cells • WBC White blood cells

	• NEC Non-squamous epithelial cells • SEC Squamous epithelial cells • YEA Yeasts • CRY Crystals • BAC Bacteria • HYA Hyaline casts • SPRM Sperm • MUC Mucus • PAT Pathological casts
Consumables	• cassette with 400 strips for urine test strip analysis: cassette with 400 cuvettes for urine microscopy analysis
Sample input/output	• Load/unload capacity: 75 samples (= 15 racks), continuous loading/unloading • Rack: 5 position rack, RD standard rack • Rack tray: tray with 15 racks/75 samples, RD standard rack tray • Automatically starts operation after routine, priority or emergency samples loading
Sample tube types	• Requisite range of diameter,. Bottom: round, conical or false
Minimal sample Volume	• Test strip and microscopy: 2.8 mL • Test strip: 2.0 mL • Microscopy: 2.0 mL • Test strip reduced volume (no SG and CLA measurements): 1.5 mL • Test strip reduced volume and microscopy: • 2.3 mL
Measurement Principles	• Reflectance photometry: with 4 different wavelengths (465, 528, 560 and 615 nm) • Refractometry: SG testing • Turbidometry: clarity testing • Automated microscopy • Automatic image evaluation
Calibration	• calibration strip for urine test strip analysis • Reference cuvette for the microscopy check
Storage capacity	• Test results: up to 10,000 sample test results (including images) • QC, photometer calibration, measuring cell calibration and microscope check: • up to 300 for each • Operator can export all results on the analyzer, including sediment images, QC and • calibration results
Power Requirements	• Line voltage: 100 – 125 VAC, permanent connection (± 10 %) • 200 – 240 VAC, permanent connection (± 10 %) • Line frequency: 50 or 60 Hz (± 5 %)
Regulatory Requirements	• Urine analyzer series meet the protection requirements laid down in IVD Directive 98/79/EC. Furthermore, our instruments are manufactured and tested • according to the following international standards: • IEC 61010-1, 2nd Edition • IEC 61010-2-081, 1st Edition • IEC 61010-2-101, 1st Edition • CAN/CSA C22.2 No. 61010 2nd Edition • EN IEC 61326-1 1st Edition • EN IEC 61326-2-6 1st Edition • UL 61010-1, 2nd Edition
Operating Conditions	• Ambient room temperature 18 – 32 °C (64.4 to 90 °F) • Relative humidity 30 % – 80 %, non-condensing
Physical Dimensions	• Width (with buffers) 107.9 cm (42.48 in) • Width (without buffers) 68.7 cm (27.05 in) • Depth 53.2 cm (20.94 in) • Height 64.4 cm (25.35 in) • Urine work area (with buffers) • Width 176.6 cm (69.53 in) • Depth 53.2 cm (20.94 in) • Height 64.4 cm (25.35 in)
Weight	• With buffers 92.7 kg (207.5 lb) • Without buffers 80.5 kg (177.47 lb) • With buffers 88.8 kg (195.8 lb) • Without buffers 76.6 kg (168.9 lb) • Urine work area • With buffers 169.3 kg (373.2 lb) • Without buffers 157.1 kg (346.3 lb)

9. Automated Semen Analyzer

- Automated system for semen analysis, which should be reportable according to the WHO 6th
- Criteria parameters
- The equipment should provide the following parameters:
- Concentration
- Total sperm count
- Total percentage motility (progressive + non progressive)
- Percentage of Rapid Progressive motility , Percentage of Slow Progressive motility
- Non Progressive motility and Immotility v. Motile sperm / ejaculate concentration
- Total progressive motile/ ejaculate concentration vii. Mean Velocity viii. Functional Sperms Concentration
- Motility index
- Percentage of normal sperm morphology
- Should have facility for a visualization system/ video microscopy.
- Software to visualize the various morphology parameters of the sperm should be available – Head, Midpiece, tail, Acrosome and other morphology xiii. Vitality and DNA Fragmentation test facility should be available
- Should have facility for quality control.
- Should be auto calibrate and display the key value.
- Disposable testing capillary.
- WHO parameter report should be non-image technology.
- The coefficient of variation of the sperm count should be less than 5%.
- Data collection and processing unit: Branded computer with 2 GHz multicore processor,
- GB RAM, DVD writer, original windows 10or higher ; TFT 23"monitor, keyboards and mouse
- The reports with raw data should be saved in a non-proprietary format for data transfer
- UPS with battery backup for 1 hour should be provided.
- The equipment should be FDA/ CE approved.
- Satisfactory demonstration is essential for technical qualifications.
- Onsite installation, training and commissioning should be done free of cost.
- Consumables for standardization and performing 100 tests should be provided with the equipment
- The printer for printing the test results should also be provided at the time on installation.
- After sales service should be available within 24 hours and by trained service personnel.

10. Cold Plate (Cooling Plate)

- Standalone unit or with the tissue embedding station
- Should be environmental friendly refrigerant
- The cooling plate should accommodate upto 80 standard cassette specimen.
- The lowest temperature that can be achieved is ambient to -20°C.
- It should have a feather touch keypad and seven segment so that display makes it easy to use.
- It should be Microprocessor Controlled
- It should have a Capacity of 80 Cassettes.
  The product should have CE certified from European notified body and manufacturer should provide 4 digits notified no.
  The equipment should be USFDA registered.
  The manufacturer should be ISO 9001 and WHO GMP certified
  Manufacturer must have experience of 10-15 years in manufacturing of similar product and also have supplied the product to Pvt. /Govt. institute and min, 5 Performance Certificate copies should be enclosed.

11. Fluorescence Microscope with FISH (Fluorescence in-situ Hybridization) software.

- **Optical System:** Infinity corrected Optical System
- **Microscope Stand:** Z-focus drive with coarse step of 25 mm with adjustment limit stopper, high sensitivity fine focus knob with minimum adjustment gradation 1µm
- **Nose piece:** 7 position revolving nosepiece with a slot for analyzer slider.
- **Observation tube:** 30˚inclined Trinocular Observation tube, light path selector between eye port and camera port 100:0; 0:100; 20:80. (FOV at least 22mm)
- **Mechanical Stage:** Hard Ceramic coated XY mechanical with coaxial stage right hand low drive XY control with dual glass slide holder.
- **Condenser:** Swing-out condenser with built-in Iris Diaphragm (NA 0.9).
- **Transmitted Illumination Light:** Light preset switch for constant voltage of light and light intensity LED indicator with Light intensity Manager switch.
- 14 W or more powerful transmitted white LED illumination with built-in-Koehler illumination, 50,000 hrs life time.
- **Objectives:** (FOV at least 22mm)
  - Plan Achromat objective 4X, (NA- 0.10)

- Plan Fluar/ Semi Apochromat objective 10X, (NA-0.3, WD 10mm)
- Plan Fluar/ Semi Apochromat objective 40X, (NA-0.75, WD 0.51mm)
- Plan Fluar/ Semi Apochromat objective 100X (NA - 1.30, Oil immerssion)

- Reflected Light for Fluorescence:
- Microscope should have inbuilt in the reflected light path for even illumination of the fluorescence signals. 130 watt mercury bulb with 2000 hrs life time for fluorescence observation with 8 or more position filter turret and the following fluorescence filters-
  - DAPI Filter (for blue)
  - Spectrum Green or FITC Filter
  - Spectrum orange or TRITC or Texas red Filter.
  - Dual Exciter Filter for DAPI/ Spectrum Green
- ACQUISITION SYSTEM:
  - Acquisition of only required region. Adjustable region of Interest in acquisition.
  - Capturing by one mouse click and the whole process is performed under the same software platform.
  - Automatic camera and image capture control with manual override function.
  - Display optimization for maximum display contrast.
  - Gallery of recently acquired metaphases available within the capture/ application window
  - Automatic image enhancements.
  - Camera : 5 MP or higher colour camera with pixel size of 3.45 µm and 35 fps, USB, Firewire or Gigabit ethernet interface.
  - Camera should have two mode Monochrome mode and Colour mode.Colour mode can work for H&E staining. Monochrome mode can work for karyotyping.
- **DATABASE:**
  - Single database for all applications
  - Modern paperless laboratory design management software should be included.
  - Workflow oriented database user interface, includes all the information about the patient demographics, images, results, etc
  - Centralized server with better network accessibility and data integrity.
  - Capable to integrate with LIS (Laboratory Information System) of the institute/organization.
  - Multi-site connectivity: Single database can support multi-site installations without the need to transfer data between workstations.
  - Ability to assign levels of security for user access.
  - Ability to associate with any external documents (pdf, word, xml etc).
  - Combined gallery view of all image types capture for a case, giving the user the ability to choose multiple images side by side viewing.
  - Any replaced or new image added should be updated in the gallery and in the database.
  - Capable to export acquired image as clipboard image.
  - Capable to import external images.
  - Image processing history to be saved with date and time of each modification. Audit trails and logging is required for case, slide and cell status modification.
  - Ability to migrate cases from various versions.
  - Search mechanism by any case or slide field or combination of any fields even when archived.
  - User notification of the next “To Do” item according to roles & permissions.
  - Ability to generate highly configurable customized reports.
  - Easy and unlimited data archival and retrieval.
  - Automated data maintenance.
  - ASI have advance search engine to find data from single or multiple data fields even when the cases are achieved.
  - ASI has search engines at different levels of filters to find cases in one click.
- **ARTIFICIAL INTELEGENCE BASED FISH IMAGING SOFTWARE:**
  - Handles metaphase, interphase and tissue samples with two, three or more probes.
  - Automated background correction.
  - Real time focus control locally per each region/cell/chromosome in the image.
  - Capable to frame Z-stack image for multiple focal planes on manual microscopes.
  - Multiple user-defined auto contrast schemes.
  - Immediate true color image display.
  - Image registration of color components, automatic or interactive.
  - Annotation capabilities, text and arrows.
  - Distance and area measurement functions.
  - Ability to view absolute value of signals intensity.
  - Full Karyotyping capabilities for karyotyping of FISH probes within the basic FISH module.

- Ability to perform chromosome segmentation operations within a single tool without additional key board strokes to switch to a different tool function (more than 10 different operations)
- Digital Manual Counting utility. Integrated M counter with powerful bioinformatics tool to score the observed signals.
- It Should be FDA approved for all the probes.
- System shoulf be upgradable to IHC in future.
- In comparison to your offered M-FISH, we prefer Spectral Karyotyping (for future plans), which is interferometer based technology, most accurate in quantification of dye intensity.
- FISH application should be FDA approved, including probes like Cep XY, Her2-Neu , ALK and Urovysion. We need this wide range of FDA approval for validating our assays on each sample type and probe.
- Simultaneous scan of metaphase and interphase FISH in the same scan, with ability to classify metaphases and interphases in separate cell galleries. This is highly recommended for our TAT.
- Quality results leveraging double blind multiple technologists scoring. Multiple users can review the cells of the same slide separately without revealing the analysis results of each user. Statisitics can be gathered digitally but cannot be seen by the next reviewer, for true double blinded process. This is highly recommended point for our FISH application.

- **COMPUTER:**
- Compatible latest branded computer with minimum Intel® Core i5 series , 8GB RAM, HDD 500GB Windows 10 professional, OS 64 bit, 25'' High Resolution Monitor, Full HD monitor with minimum resolution of 2560 x 1440 at 60 Hz.
- 2KVA UPS with at least half an hour battery back-up.

12. High-Speed Digital Pathology Slide Scanner

- It should be a Non-Microscope based automated Whole Slide Imaging (WSI) BrightfieldScanner.
- Scanner should have CE IVDR Certificate.
- It should be able to scan both Formalin-Fixed Paraffin-Embedded (FFPE) Tissue andCytology slides.
- Scanner should be able to Scan 15x15mm tissue at 40x Magnification under 1(One)Minute.
- Must have Slide Autoloader which can load a minimum of 70 slides per batch which canbe increased in future.
- In case a slide has error, scanner should skip it and continue scanning other slides.
- Scanner should be able to change scanning sequences anytime.
- Scanner should be able to produce 40x magnification images at
- **0.25 micron/pixel.**
- It should Automatically Detect Tissue areas on the slide.
- For Cytology slides it must be able to first check for sample adequacy,
- **and then scan Multiple Layers (Z stacking) and combine them into a Composite Focusedimage.**
- It should be able to scan both Single width (1"x3") andDouble width (2"x3") slides for different sample sizes.
- Slide image storage formats should be TIFF and JPEG2000 with ability to converts toother common types.
- It should be able to store scanned images and patient data instantly to eitherCloud Storage or Local Storage.
- Stored images and patient data must be accessible both locally and remotely for reviewand reporting.
- Should have optical Auto-Focus to clearly capture Uneven Tissues.
- It must have both manual entry and Barcode Recognition for accessing patient data.
- Company should have customizable Image Analysis Algorithms for:
  - ER,
  - PR,
  - Her2,
  - Ki67,
  - PD-L1,
  - Cytology,
  - Breast Cancer,
  - Prostate Cancer.
- Scanner Device must be pre-equipped with Analytic Framework such that it will have anability to simultaneously scan and analyze pathology glass slide regions prior to creatingwhole slide image with embedded analysis results.
- It must have an image management software for database support for patient's scannedimage acquisition, archival, retrieval and tele-sharing.
- It should have capability of both Online and Offline Tele-Pathology conference allowingsharing control and simultaneous chat and review of scanned images by multiple pathologists from remote locations.
- It should have distinct levels of password protected role-based access for doctors,technicians, and IT manager.
- All access records should be accessible later for auditing.
- Scanner should be able to be Serviced Remotely for instant service and applicationsupport.
- Manufacturing company must be ISO 13485 Certified.
- Scanner should support Bidirectional Integration with Hospital/Lab Information System.

13. FISH Work-Station

- **Upright Fluorescence Microscope with Camera Specification:**
- Microscope frame for transmitted light microscopy, With Built in Koehler illumination with field iris diaphragm ring built in with transmitted light Halogen / LED, High Sensitivity Focusing Knob Fine adjustment: 0.1 mm per turn. Coarse adjustment: 15 mm per turn. Stroke: 25 mm (1micro m gradiation), UIS Optical System or Better
- Precentered. Lamp housing incorporating a white LED Lamp house, excellent color reproduction, LED life Min. 20,000 hours, with connecting cable
- Trinocular tube, FN22, fixed light pass, Bi/Photo: 50/50, Interpupillary Distance Adjusting Range 48–75 mm, inclination 30 degrees or better
- Set of Wide field 10X, FN22 and 10X, FN22 , focusable eyepieces of better
- Ceramic surface mechanical stage with right-hand low drive control (long type), provision for adjusting the X- and Y-Axis movement knob tension. Stage can be rotated upto 230° or better with Thick type Specimen Holder for two specimen
- Universal condenser NA1.1 or better, Turret type five postion for Bright Field, Phase contrast &Darkfield applications
- Sextuple revolving nosepiece suitable for DIC/ Simple Pol
- Specimen holder for two specimens, thick type
- Reflected Light for Fluorescence:
- Microscope should have inbuilt reflected light path for even illumination of the fluorescence signals. 100 watt mercury bulb with 2000 hrs life time for fluorescence observation with 8 or more position filterturret and the following fluorescence filters-
  - DAPI Filter
  - FITC Filter
  - TRITC Filter
- **Objectives:** (FOV at least 22mm)
  - Plan Achromat objective 4X, (NA- 0.10)
  - Universal Plan Semi Apochromat objective 10X, (NA-0.3, WD 10mm)
  - Universal Plan Semi Apochromat Phase Objective 20X/0.5, WD 2.1 (spring)
  - Universal Plan Semi ApochromatPhase objective 40X, (NA-0.75, WD 0.51mm)
  - Universal Plan Semi Apochromat objective 100X (NA - 1.30, Oil immerssion)
- 1X C-Mount adapter, Immersion oil 8cc and Dust Cover should be provided at no extra cost
- **CMOS Color Camera:** Resolution of at least 8.9 Mega Pixels, should be suitable for BF/PH/DIC/FL, Global shutter & Large Sensor size of at least 1 inch, Pixel size of 3.45 x 3.45 µm or larger, Live frame rate of at least 32 fps at full resolution up to 64 fps with ROI/binning, USB3.0 or better interface, exposure time of at least 27 µs to 15s. Should be able to work in Full HD (1920 x 1080) mode with speed not less than 64 fps. **Camera should be capable of projecting images on an LED screen and with the help of projector overhead into a hanging screen**
- **Image Analysis System:** Image capture and processing software for advanced imaging in life science and clinical applications. Easily capture and process images with excellent reproducibility and accuracy. Basic Controls, Real time preview, manual/auto exposure, white balance, gain, brightness, gamma, saturation, user friendly archive, intensity, hue, image orientation, averaging, sub-sampling, light source selection, clockwise/counter clockwise, flip vertical, flip horizontal, flip diagonal, zoom preview, cascade, tile horizontal, tile vertical, Single capture, auto increment filename and single key capture, the software should be capable of doing measurement of Point-to-point, polyline, circle from 3 points, light, density, micrometer, grid/circle overlay, manual calibration, and drag and drop data to excel. It should have capability of annotation, advanced image processing. **The quoted camera & software should both be from the same manufacturer as that of the microscope**
- Desktop computer of a reputed make compatible with microscope and its software havingfollowing configuration: Processor-Intel Core i5, 16GB RAM, 1 TB and 4 GB Nvedia Graphic Card with Original Windown 10 OS, 22 inches or more LED Monitor with suitable Keyboard, Mouse and UPS.
- The entire system should have minimum 1 year of Warranty
- Cytogenetic Workstation
- Hardware Configuration
- **Optical System:** Infinity corrected Optical System
- **Microscope Stand:**Should have motorized Z-focus drive with minimum step resolution of 10nm with
- touch pad control. At least 8 Position motorized fluorescence filter turret, at least 7 position motorized
- nosepiece facility with slot for DIC,Fixed stage nosepiece based Z focusing.
- **Nose piece:** Motorized 7 position revolving nosepiece with a slot for analyzer slider.
- **Observation tube:** 30˚inclined Trinocular Observation tube, light path selector between eye port and
- camera port 100:0; 0:100; 20:80. (FOV at least 22mm)
- **Mechanical Stage:** Hard Ceramic coated XY mechanical with coaxial stage right hand low drive XY
- control with dual glass slide holder.
- **Condenser:** Swing-out condenser with built-in Iris Diaphragm (NA 0.9).

- **Transmitted Illumination Light:** Light preset switch for constant voltage of light and light intensity LED
- indicator with Light intensity Manager switch. Powerful transmitted white LED illumination with built-in-Koehler illumination, 50,000 hrs life time.
- **Objectives:** (FOV at least 22mm)
  - Plan Achromat objective 4X, (NA- 0.10)
  - Plan Fluar/ Semi Apochromat objective 10X, (NA-0.3, WD 10mm)
  - Plan Fluar/ Semi Apochromat objective 40X, (NA-0.75, WD 0.51mm)
  - Plan Fluar/ Semi Apochromat objective 60X (NA 1.25, Oil immersion)
  - Plan Fluar/ Semi Apochromat objective 100X (NA - 1.30, Oil immerssion)
- Reflected Light for Fluorescence:
- Microscope should have inbuilt reflected light path for even illumination of the fluorescence signals. 100 watt mercury bulb with 2000 hrs life time for fluorescence observation with 8 or more position filterturret and the following fluorescence filters-
  - DAPI Filter (for blue)
  - Spectrum Green or FITC Filter
  - Spectrum orange or TRITC or Texas red Filter
  - Dual Exciter Filter for DAPI/ Spectrum Green
- ACQUISITION SYSTEM:
  - Acquisition of only required region. Adjustable region of Interest in acquisition.
  - Capturing by one mouse click and the whole process is performed under the same software platform.
  - Automatic camera and image capture control with manual override function.
  - Display optimization for maximum display contrast.
  - Gallery of recently acquired metaphases available within the capture/ application window
  - Automatic image enhancements.
  - Camera : 5 MP or higher colour camera with pixel size of 3.45 μm and 35 fps, USB, Firewire or Gigabit ethernet interface.
  - Camera should have two mode Monochrome mode and Colour mode.Colour mode can work for H&E staining. Monochrome mode can work for karyotyping.
- DATABASE:
  - Single database for all applications
  - Modern paperless laboratory design management software should be included.
  - Workflow oriented database user interface, includes all the information about the patient demographics, images, results, etc
  - Centralized server with better network accessibility and data integrity.
  - Capable to integrate with LIS (Laboratory Information System) of the institute/organization.
  - Multi-site connectivity: Single database can support multi-site installations without the need to transfer data between workstations.
  - Ability to assign levels of security for user access.
  - Ability to associate with any external documents (pdf, word, xml etc).
  - Combined gallery view of all image types capture for a case, giving the user the ability to choose multiple images side by side viewing.
  - Any replaced or new image added should be updated in the gallery and in the database.
  - Capable to export acquired image as clipboard image.
  - Capable to import external images.
  - Image processing history to be saved with date and time of each modification. Audit trails and logging is required for case, slide and cell status modification.
  - Ability to migrate cases from various versions.
  - Search mechanism by any case or slide field or combination of any fields even when archived.
  - User notification of the next “To Do” item according to roles & permissions.
  - Ability to generate highly configurable customized reports.
  - Easy and unlimited data archival and retrieval.
  - Automated data maintenance.
  - ASI have advance search engine to find data from single or multiple datafields even when the cases are achieved.
  - ASI has search engines at different levels of filters to find cases in one click
  - **ARTIFICIAL INTELEGENCE BASED KARYOTYPING SOFTWARE:**
  - Ability for multiple users to perform analysis on individual images within the same case simultaneously, for faster analysis of an urgent case.
  - Import and analyze metaphase images captured by third party system in standard image formats.

- Machine learning algorithm for classification of each chromosome and arrangement in the karyogram per laboratory samples.
- Automatic threshold to separate between background and chromosomes.
- Single click access to customizable set of reference websites from the karyotyping application.
- Ablility to handle G-,R-,Q- banding, polyploid cells and markers.
- Drag and Drop Chromosomes in karyotype: The entire chromosome should be seen (with all its gray values) while dragged into Karyotype (not just the contour), in order to enable comparing bands even before released in a new location.
- Expand or shrink specific chromosome boundaries by keyboard short key.
- Ability to perform chromosome segmentation operations within a single tool without additional key board strokes or mouse clicks to switch to a different tool function, with more than 10 different operations.
- Join objects into one chromosome.
- Separation of complex chromosome clusters using brush tool.
- All contour editing and segmentation operations, including addition of missing telomere regions, can be done within the karyotype window.
- Automatic separation of touching chromosomes without user interaction.
- Enhancement tools (sharpening, contrast, staining etc.) are available using sliders in all analysis steps.
- Automatic counting of chromosomes with minimal adjustment to complete full chromosome count.
- Incorporate the sex chromosomes within the count tool for a display of both the model number and sex.
- User can perform indexing on the metaphase image with the ability to associate a "?" or text with a chromosome for visual awareness within the image with automatic display in ISCN format within the results.
- Keyboard short keys for indexing.
- Mark and count the overlapped chromosomes automatically
- User can track and mark the chromosomes overlapping p/q arms.
- Free text annotation, and markups, with different colors and shapes can be added to metaphase, karyogram images and ideograms.
- Ability to localise Marker Chromosomes in Karyotype view.
- System can automatically present a single karyotype of multiple patients (like family members) with all chromosomes included side by side for each class.
- Karyotype arrangement is adjusted automatically based on content of chromosomes, even if chromosome size is larger than standard size of the group or 10 or more chromosome are in the same class.
- Drag to re-classify chromosomes from one class to the other.
- Ability to perform a Chromosome Compare by allowing user to simultaneous review (side by side) chromosomes from either all Karyotyped cells of the case and from selected Karyotyped cells of the case. Minimal need to show chromosomes from 20 cells simultaneously.
- Ability to perform a Multi-Case Chromosome Compare by allowing user to simultaneous review (side by side) chromosomes from multiple related cases within a single view. Minimal need to show 2 to 6 cases side by side simultaneously.
- Ability to define a karyotype with all chromosomes of multiple family members.
- Ablility to prepare the customised ideograms.
- Support ISCN formats for 300, 400, 550, 700 and 850 -band levels of resolution.
- Automatic ISCN - embedded abnormality text.
- Automatic measurement of band resolution.Software should be FDA approved.
- **FISH IMAGING SOFTWARE:**
- Handles metaphase, interphase and tissue samples with two, three or more probes.
- Automated background correction.
- Real time focus control locally per each region/cell/chromosome in the image.

- Capable to frame Z-stack image for multiple focal planes on manual microscopes.
- Multiple user-defined auto contrast schemes.
- Immediate true color image display.
- Image registration of color components, automatic or interactive.
- Annotation capabilities, text and arrows.
- Distance and area measurement functions.
- Ability to view absolute value of signals intensity.
- Full Karyotyping capabilities for karyotyping of FISH probes within the basic FISH module.
- Ability to perform chromosome segmentation operations within a single tool without additional key board strokes to switch to a different tool function (more than 10 different operations)
- Digital Manual Counting utility. Integrated M counter with powerful bioinformatics tool to score the observed signals.
- It Should be FDA approved for all the probes.
- System shoulf be upgradable to IHC in future.
- In comparison to your offered M-FISH, we prefer Spectral Karyotyping (for future plans), which is interferometer based technology, most accurate in quantification of dye intensity.
- FISH application should be FDA approved, including probes like Cep XY, Her2-Neu , ALK and Urovysion. We need this wide range of FDA approval for validating our assays on each sample type and probe.
- Simultaneous scan of metaphase and interphase FISH in the same scan, with ability to classify metaphases and interphases in separate cell galleries. This is highly recommended for our TAT.
- Quality results leveraging double blind multiple technologists scoring. Multiple users can review the cells of the same slide separately without revealing the analysis results of each user. Statisitics can be gathered digitally but cannot be seen by the next reviewer, for true double blinded process. This is highly recommended point for our FISH application.
- **COMPUTER:**
- Compatible latest branded computer with minimum Intel® Core i5 series , 8GB RAM, 1TB Windows 10 professional, OS 64 bit, 25'' High Resolution Monitor, Full HD monitor with minimum resolution of 2560 x 1440 at 60 Hz.
- 2KVA UPS with at least half an hour battery back-up.
- HYBRIDIZATION CHAMBER:
- **GENERAL FEATURES:**
- Temperature & humidity control
- Superior temperature uniformity across all slide positions.
- Rapid temperature ramp-up and accuracy of ±1°C.
- Lid tightly sealed allows maintaining uniform temperature and ensuring high humidity levelacross all slide positions.
- Programmable settings
- Different operation modes: denaturatio/hybridization, Fixed Temperature, and Custom
- Profiles.
- 60 user programmable settings.
- The instrument can accommodate up to a maximum of 12 microscope slides simultaneously.
- Easy to use
- Touch screen: for easy reading and programming.
- Eliminates manual steps and reduces hands-on time during FISH procedures.
- Slides do not need to be fully loaded to maintain temperature accuracy.
- Slide guide keeps slides in place and allows for one hand removal.
- TECHNICAL FEATURES:
- Temperature control range RT+5°C~99.9°C
- Time range 1min ~ 99h59min
- Temperature control accuracy ≤±1°C
- Temperature uniformity ≤±1°C
- Heating time (37°C to 95°C) ≤3min
- Cooling time (95°C to 45°C) ≤7min
- Capacity 12 Slides
- Max. Input power 350W
- Dimension dxwxh (mm) 420×225×143
- Net weight (kg) 5.2
- SAFETY
- HyperChrome complies with the following EU directive:
- 2006/95/EC
- 2004/108/EC
- MAINTENANCE

- The heating surface must be always kept clean, any particle must be removed to ensure a directcontact between the heating surface and slide. Use a cloth with alcohol to clean the heating surface.Fill the water tanks with purified water. The level must be checked and maintained constantly.
- FISH Probes
- Different FISH Probes need to be quoted (Vysis LSI BCL Dual Colour Break Apart Rearrangement Probe, MYC Dual ColorBreak Apart Rearrangement Probe, BCL2 Dual ColorBreak Apart Rearrangement Probe and Vysis LSI IGM/MYC/CEP 8 Tri-Color Dual Fusion Probes)
- **Fully Automated microtome**
- The instrument must have the following specifications:
- Fully-Motorized Rotary Microtome with low-maintenance and backlash-free precision micrometer feed system with step motor.
- Fully capable of dual mode : Motorized & Manual sectioning applications
- Horizontal feed and vertical stroke mechanisms must be based on cross roller bearings.
- Smooth-running hand-wheel allows two manual sectioning modes: rocking mode and conventional manual sectioning with full hand-wheel rotation, and 3 motorized sectioning modes: single, continuous and step.
- Motorized horizontal specimen head movement should be done in 2 ways:
- Using the coarse feed buttons on the control panel in two speeds per direction in continuous or in step feeding mode.
- b. Using the ergonomically positioned and unique coarse feed wheel which can be personalized by user selectable preferred turn direction.
- The sectioning speed can be adjusted while motorized sectioning is in progress.
- The ergonomic handle of the safety handwheel can be centered while working motorized.
- The emergency stop button on the microtome front or E-function in optional foot stop will interrupt motorized sectioning immediately in case of emergency.
- Two independent hand-wheel locking systems, plus one electronic brake after motorized usage, ensure that the hand-wheel is safely locked.
- Unique operator-adjustable force balancing system is MANDATORY with Spring Force compensation offering two advantages:
- o 1. Flexibility to adapt the spring force to different weights of specimen/clamps,
- eliminating the risk of an object head dropping into the knife.
- o 2. No need for a heavy counter balance in the hand-wheel.
- Section thickness settings for trimming and sectioning can be selected and saved independently of each other.
- Individually adjustable sectioning range on the specimen size (sectioning window).
- Important operation information is indicated on the front of the instrument:
- o trimming or section thickness,
- o specimen retraction (Retract),
- o emergency stop (E-stop),
- o hand-wheel/specimen head locking function (Lock),
- o section counter and section totalizer with reset function
- Programmable specimen retraction system for manual cutting mode with ON/OFF function
- Self-adjusting specimen retraction in motorized sectioning mode speed dependent.
- Unique rocking mode function on the control panel for rapid trimming.
- Visual/acoustic signals indicate the remaining feed and the front and rear travel limits.
- Efficient and rapid specimen exchange :
- by using the user programmable Memo position ,,
- 2. the Fast Homing function of the object head within 13 +/- 2 seconds from front to rear position.
- Large top surface area with TOP TRAY allows placement of objects that require a flat surface: removable top tray allows storage of sectioning tools and prevents items from falling.
- Unique magnetized antistatic section waste tray holds a large volume of waste and offers ease of cleaning due to its antistatic surface resulting in improved workflow and efficiency at a significantly reduced cleaning time. Brand/Company must provide evidence to prove the reduction in cleaning time.
- Precision specimen orientation with horizontal and vertical rotation of +/- 8°, and calibrated controls, helps to quickly orient both new and previously cut specimens (re-cuts). Two red indicators help to rapidly return back to the exact zero position.
- Personalized bi-directional coarse feed wheel for improved comfort and easy usage: Lateral electronic coarse feed system - user selectable turn direction in both Clock-Wise &AntiClock wise directions as per user comfort
- Quick clamping systems for fast removal (e.g. for cleaning) or exchange of specimens clamps. Rapid specimen exchange with fast homing and programmable Memo position---the Memory function remembers the position of specimen
- Universal cassette clamp secures cassettes horizontally as well as vertically and is optimized for the use with cassettes
- The two-in-one blade holder with colored safety guard and safe blade ejection can be used with both, high or low profile blades.
- The lateral displacement function of the blade holder with three predefined stop positions (left, center, right) correspond to the width of a standard histology cassette, facilitate the exact usage of the entire length of the blade.
- Trimming section thickness setting range: 1.0 to 600 µm

- Setting values:
- From 1 to 10 µm in 1.0 µm increments
- From 10 to 20 µm in 2.0 µm increments
- From 20 to 50 µm in 5.0 µm increments
- From 50 to 100 µm in 10.0 µm increments
- From 100 to 600 µm in 50.0 µm increments
- Section thickness setting range: 0.5 to 100 µm
- Setting values:
- From 0.5 to 5.0 µm in 0.5 µm increments
- From 5 to 20.0 µm in 1.0 µm increments
- From 20 to 60.0 µm in 5.0 µm increments
- From 20 to 60.0 µm in 5.0 µm increments
- From 60 to 100.0 µm in 10.0 µm increments
- Horizontal feed range: 24 +/-1 mm/ 0.94 inches, **feed motion via robust stepper motor**
- Vertical stroke length: 70 +/-1 mm
- Sectioning speed: 0-420 mm/s +/- 10%
- Electronic coarse feed speeds of 3 different choices as per user's comfort:
- slow forward and backward: 300 µm/s, fast forward: 800 µm/s and super-fast backward (fast homing): 1800 µm/s
- Specimen retraction in manual sectioning mode: 5-100 µm in 5 µm increments, can be switched ON/OFF at any time
- Specimen retraction in motorized sectioning mode: self-adjusting, speed dependent---a very important feature in a microtome
- Must be an imported model, with both European CE Certified & US-FDA approved

14. Fully Automated microtome

- Fully-Motorized Rotary Microtome with low-maintenance and backlash-free precision micrometer feed system with step motor.
- Fully capable of dual mode : Motorized & Manual sectioning applications
- Horizontal feed and vertical stroke mechanisms must be based on cross roller bearings.
- Smooth-running hand-wheel allows two manual sectioning modes: rocking mode and conventional manual sectioning with full hand-wheel rotation, and 3 motorized sectioning modes: single, continuous and step.

- Motorized horizontal specimen head movement should be done in 2 ways:
- **Using the coarse feed buttons on the control panel in two speeds per direction in continuous or in step feeding mode.**
- **b. Using the ergonomically positioned and unique coarse feed wheel which can be personalized by user selectable preferred turn direction.**

- The sectioning speed can be adjusted while motorized sectioning is in progress.
- **The ergonomic handle of the safety handwheel can be centered while working motorized.**

- The emergency stop button on the microtome front or E-function in optional foot stop will interrupt motorized sectioning immediately in case of emergency.
- Two independent hand-wheel locking systems, plus one electronic brake after motorized usage, ensure that the hand-wheel is safely locked.
- **Unique operator-adjustable force balancing system is MANDATORY with Spring Force compensation offering two advantages:**
- **o 1. Flexibility to adapt the spring force to different weights of specimen/clamps,**
- **eliminating the risk of an object head dropping into the knife.**
- **o 2. No need for a heavy counter balance in the hand-wheel.**
- Section thickness settings for trimming and sectioning can be selected and saved independently of each other.

- Individually adjustable sectioning range on the specimen size (sectioning window).
- **Important operation information is indicated on the front of the instrument:**
- **o trimming or section thickness,**
- **o specimen retraction (Retract),**
- **o emergency stop (E-stop),**
- **o hand-wheel/specimen head locking function (Lock),**

- **o section counter and section totalizer with reset function**
- Programmable specimen retraction system for manual cutting mode with ON/OFF function
- Self-adjusting specimen retraction in motorized sectioning mode speed dependent.
- Unique rocking mode function on the control panel for rapid trimming.
- Visual/acoustic signals indicate the remaining feed and the front and rear travel limits.
- **Efficient and rapid specimen exchange :**
- **by using the user programmable Memo position ,,**
- **2. the Fast Homing function of the object head within 13 +/- 2 seconds from front to rear position.**
- Large top surface area with **TOP TRAY** allows placement of objects that require a flat surface: **removable top tray allows storage of sectioning tools and prevents items from falling.**
- **Unique magnetized antistatic section waste tray holds a large volume of waste and offers ease of cleaning due to its antistatic surface resulting in improved workflow and efficiency at a significantly reduced cleaning time. Brand/Company must provide evidence to prove the reduction in cleaning time.**
- Precision specimen orientation with horizontal and vertical rotation of +/- 8°, and calibrated controls, helps to quickly orient both new and previously cut specimens (re-cuts). Two red indicators help to rapidly return back to the exact zero position.
- **Personalized bi-directional coarse feed wheel for improved comfort and easy usage: Lateral electronic coarse feed system - user selectable turn direction in both Clock-Wise &AntiClock wise directions as per user comfort**
- **Quick clamping systems for fast removal (e.g. for cleaning) or exchange of specimens clamps. Rapid specimen exchange with fast homing and programmable Memo position---the Memory function remembers the position of specimen**
- Universal cassette clamp secures cassettes horizontally as well as vertically and is optimized for the use with cassettes
- **The two-in-one blade holder with colored safety guard and safe blade ejection can be used with both, high or low profile blades.**
- **The lateral displacement function of the blade holder with three predefined stop positions (left, center, right) correspond to the width of a standard histology cassette, facilitate the exact usage of the entire length of the blade.**
- **Trimming section thickness setting range: 1.0 to 600 µm**
- **Setting values:**
- **From 1 to 10 µm in 1.0 µm increments**
- **From 10 to 20 µm in 2.0 µm increments**
- **From 20 to 50 µm in 5.0 µm increments**
- **From 50 to 100 µm in 10.0 µm increments**
- **From 100 to 600 µm in 50.0 µm increments**
- **Section thickness setting range: 0.5 to 100 µm**
- **Setting values:**
- **From 0.5 to 5.0 µm in 0.5 µm increments**
- **From 5 to 20.0 µm in 1.0 µm increments**
- **From 20 to 60.0 µm in 5.0 µm increments**
- **From 20 to 60.0 µm in 5.0 µm increments**
- **From 60 to 100.0 µm in 10.0 µm increments**
- Horizontal feed range: 24 +/-1 mm/ 0.94 inches, **feed motion via robust stepper motor**
- Vertical stroke length: 70 +/-1 mm
- Sectioning speed: 0-420 mm/s +/- 10%
- **Electronic coarse feed speeds of 3 different choices as per user's comfort:**
- **slow forward and backward: 300 µm/s, fast forward: 800 µm/s and super-fast backward (fast homing): 1800 µm/s**
- **Specimen retraction in manual sectioning mode: 5-100 µm in 5 µm increments, can be switched ON/OFF at any time**
- **Specimen retraction in motorized sectioning mode: self-adjusting, speed dependent---a very important feature in a microtome**
- **Must be an imported model, with both European CE Certified & US-FDA approved**
- Should have dedicated Service Support only for East India with a team of service engineers (at least 3 persons-Not of Distributor's) headquartered preferable in Kolkata, for prompt service in East region. SERVICE MATRIX PROOF should be attached with Regional Service Manager & All-India Helpline Number to escalate service issues.

15. CYTOSPIN / CYTOCENTRIFUGE

- The equipment should meet the following specifications:

- The equipment should be a Bench-top centrifuge for cytology specimens
- The equipment should be capable of thin-layer cell preparation for retrieving cells from various body fluids especially paucicellular fluids and preserving their morphology
- Should be capable of processing up to 12 specimens at one time
- Should be equipped with Biological safety cabinet for safety of the operator
- Auto-lid lock during rotation with a special lidrelease mechanism should be available
- Should be designed for easy disinfection and also have a wipe- clean control panel
- Should be resistant to fluid spillage on the electronic components with capped disposable sample compartments/ chambers for elimination of aerosol
- May have different sizes of disposable chambers Safety alarms during all stages of operation should be available
- Microprocessor based controls and programming for time and speed with pull-out program card for fast retrieval
- Should be compliant with international standards for electrical equipment requirements for laboratory use
- 220 V, 50Hz Speed 100 to 4,000 rpm
- Noise levels < 50 Db The equipment should be a automated slide preparation system that produces uniform thinlayer slides for both gynecologic and nongynaecological sample processing which should remove obscuring blood, mucus, debris and also thoroughly mix the sample
- Processes about 80 samples per cycle with automatic chain-of-custody verification of patient samples

16. FLOW CYTOMETRY

- **Benchtop Multicolor upgradable flow cytometer**
- System should be a Bench-top flow cytometer with 3 solid state lasers (Blue 488 nm, Red 638-640 nm and Violet 405-407 nm) with 12 colors with 2 scatter detection (forward and side scatter) configuration and 14 parameters.
- All fluorescence channels and side scatter detection channel must incorporate Photomultiplier Tubes (PMTs)/APD.
- Sample carry over should be less than equal to 0.1%.
- All lasers and their excitation-optics should be fixed aligned.
- System should have capability to acquire at least 20,000 events or more per second.
- The system should provide at least sensitivity: <110 MESF-FITC, <80 MESF PE.\
- Automated QC: System should have automated quality control procedures, and automatically output reports to provide comprehensive information about the instrument (delay laser, laser power, channel gain, mean fluorescence intensity and rCV value, etc.), to protect your daily results and reliable and stability, and draw Levey Jenning quality control chart, the entire instrument status monitoring.
- Automatic intelligent software: user-friendly, intuitive, and easy to learn, with automatic adjustment of various parameters, greatly improving your working efficiency.
- The system should be able to do automated compensation calculation, single fluorochrome addition and interbeam compensation.
- System should be US FDA-IVD/European CE-IVD certified for clinical applications.
- System should be capable of accepting IVD certified -Dry Reagents, Wet Reagents, Cocktails, and Individual Color Antibodies.
- System should have automated start up and shutdown procedures. Software should support acquisition of 5 million or more events per tube enabling rare event detection/MRD analysis.
- Should have single tube acquisition format along with at least 25 tubes carousal autoloader.
- Suitable workstation should be supplied for online analysis along with Machine.
- Suitable Online UPS with 1 hour back, Color laser Printer should be included.
- Latest model should be quoted.
- Comprehensive Warranty with parts and accessories for 5 years and without parts and accessories for the next five years.
- The company should supply all the startup reagents, including at least 10 antibodies attached to different fluorochromes, free of cost.
- The company should provide onsite full application training for doctors and technicians along with training of all doctors at well-established and renowned centers for flow cytometry for at least 10 days free of charge.
- The company should shift the complete instrumental set up and reinstall from one campus to another campus, free of cost, as and when required.
- The price of antibodies (leukemia panel (8 color panel), lymphoma panel, myeloma panel, PNH panel), calibration beads, set up beads and buffers supplied by the company as per catalogue should be fixed for the next 5 years.
- A separate offline analysis workstation: i5 Processor or higher, >32GB RAM, NVIDIA RTX 3060 Graphic card, Solid State minimum1TB drive and 23" monitor, Windows 10 or above should be provided.
- System should be LIS compatible.

17. Slide Cabinet (Vertical 100000 Capacity)

- It should store large quantity of slides in less space.
- Cabinet should be made up of good quality cold rolled steel with powder coating finish.
- The drawers should be slidable.
- Cabinets should be stackable.
- For each drawer handle is provided.
- The slide storage cabinets should be stackable to accommodate increasing demand.
- Storage Capacity
- 10000 / 20000 / 30000 / 40000 slides
- The cabinet must be USFDA approved
- Manufacturer must have experience of at least 30 years in Histopathology products
- Manufacturer must have supplied the similar product in at least 10 reputed institutes/ Hospitals must enclosed the PO and the performance certificate.

18. Slide Cabinet (Horizaontal) 5000 Capacity

- It should store large quantity of slides in less space.
- Cabinet should be made up of good quality cold rolled steel with powder coating finish.
- The drawers should be slidable.
- Cabinets should be stackable.
- For each drawer handle is provided.
- Slides must be placed in groove. For each slide groove is provided

- The slide storage cabinets should be stackable to accommodate increasing demand.
- Storage Capacity
- 1500 / 3000 / 4500 / 6000 slides
- The cabinet must be USFDA approved
- Manufacturer must have experience of at least 30 years in Histopathology products
- Manufacturer must have supplied the similar product in at least 10 reputed institutes/ Hospitals must enclosed the PO and the performance certificate

19. 26 HEAD MICROSCOPE WITH CAMERA

- Optical system : Infinity corrected system
- Focus : Vertical stage movement 25mm per coarse stroke
  Vertical stage movement 1micron per fine stroke.Illumination
  : Built-in-Koehler illumination for transmitted light
  - 14 watt power LED Light source with lifetime of 50000 hrs.
  - Intensity adjustment centrally located so both hand
  - Can be used to increase and decrease light.
  - Light preset switch for photography
- Revolving nosepiece: Interchangeable reversed Septuple nosepiece.

- **Objectives : Plan ,4x(NA0.10), 10X(NA 0.25), 40X(NA0.65), & 100XO(N.A**
- **1.25,WD 0.13)**
- Observation tube : Wide field Trinocular head with Field no 22mm.
- Stage : Ceramic-coated coaxial stage with right hand low drive Control
- Condenser : Swing out condenser (N.A 1.1), for 2x -100x

- **Teaching Attachment : For 25+1 persons with same orientation**
  - Head with eyepiece of **Field no. 22**
- Camera &Software:
- At least 6.4 MP or higher CMOS camera with pixel size 2.4µm X 2.4µm or bigger. With up to 64 fps at full resolution,4 K resolution, focus peaking mechanisam,25mm FOV with Advanced Image analysis software for Bright field, Phase contrast DIC & Fluorescence Microscopy.
- Software should have the following feature that includes: Snap shot, Time lapse, Merging, side image comparison, Movie playback, Tile view, Region and line measurements, Phase analysis, line/free hand/polygon measurement, Intensity plot over time, Auto white balance, binning, ROI, Histogram, Crop, Background correction/Subtraction, data export to MS Excel, Word and Power point. Image saving format TIFF, JPG, PNG, AVI etc.
- System should have arrow pointer to display in digital images for demonstration. Microscope should be upgradable with 8 channel fluorescence with 130 watt mercury fluorescence attachment& DIC application.

20. Biheader Microscope

- Trinocular microscope with inward facing 5-position objective nosepiece turret and Kohler adjustment.
- Abbe condenser 0.90/1.25 oil with labels for matching Objective magnifications.
- Microscope should have sturdy grab handle for shifting of the microscope with one hand only. Should have cord wrap slots at the back.
- Should have LED illumination with Koehler adjustment, 4000K temp or more and minimum 20 years life hrs.
- "Automated Time delay illumination shut off facility for long LED life Time"
- 6. Objective:
- i) HI PLAN 4x/0.10, WD 18mm or better
- ii) HI PLAN 10x/0.25 WD 12mm or better
- iii) HI PLAN 20x/0.40, WD 0.36mm or better
- iv) HI PLAN 40x/0.65, WD 0.36mm or better
- v) HI PLAN 100x/1.25 OIL, WD 0.10mm or better
- 7. Immersion oil should be provided with the microscope
- 8. Main Observation Tube Trinocular 30 degree angle, Pair of 10x eyepiece/ FOV 20mm Focusable.
- 9. The microscope should have Bi headed discussion tube with binocular head in each, LED pointer and 10x eyepiece/ FOV 20mm,
- 10. 30 degree inclination to be provided. Must be suitable for observation for total 3 persons together.

- 11. Right hand control mechanical stage with round corners & non extending rack and slide holder. Wear resistant stage with Silver (Ag) treatment on the complete microscope to avoid any contamination and not easily damaged by friction.

21. TRI HEAD MICROSCOPE WITH CAMERA

- Optical system : Infinity corrected system
- Focus : Vertical stage movement 25mm per coarse stroke
  Vertical stage movement 1micron per fine stroke.
- Illumination : Built-in-Koehler illumination for transmitted light
- 14 watt power LED Light source.
- Intensity adjustment centrally located so both hand
- Can be used to increase and decrease light.
- Light preset switch for photography
- Revolving nosepiece: Interchangeable reversed Septuple nosepiece.

- **Objectives : Plan ,4x(NA0.10), 10X(NA 0.25), 40X(NA0.65), & 100XO(N.A**
- **1.25, WD 0.13)**
- Observation tube : Wide field Trinocular head with Field no 22mm.
- Stage : Ceramic-coated coaxial stage with right hand low drive Control
- Condenser : Swing out condenser (N.A 1.1), for 2x -100x

- **Teaching Attachment : For 1+2 persons**
- Head with eyepiece of **Field no. 22**
- Camera and software
- Camera Casing- Metal Alloy, Camera Dimension- 60 X60X40 mm, Image sensor- CMOS 5.1 Mp,
- size- 2.2 X 2.2 micron, Resolution (Max)- 2592 X 1944 Pixels, Frame Rate- 5@2592
- Dynamic range-66.5dB,Signal/Noise ratio- 40.5dB, Sensor Size- ½.5'', Pixel Bining- 2X2, 4x4,
- Exposour time- 0.29ms to 2000ms, Spectral Range 380-650nm with IR filter
- System should have arrow pointer to display in digital images for demonstration. Microscope should be upgradable with 8 channel fluorescence with 130 watt mercury fluorescence attachment& DIC application.

22. Benchtop Next Generation Sequencing System

- System should occupy minimal lab footprint and should be offered as a single, integrated instrument capable of performing template DNAamplification, sequencing and primary analysis. Prepared libraries should be loaded directly onto the sequencer, and there should be no need of an ancillary system for template amplification.
- The sequencing chemistry should mimic natural biological chemistry with simultaneous addition of all four bases in the sequencing reaction for competitive addition to the DNA template. The chemistry should thus allow for highly accurate sequencing through homopolymeric regions.
- The sequencing workflow should allow fully automated, walk-away operation, without user intervention, fortemplate amplification to analyzed data on a single machine, and support unattended operation for at least 300 sequencing cycles.
- System should use dedicated reagents for generating data of upto7.5 Gb and 25 million single reads of high-quality data passing filter. The output should be scalable, for data between 1.65 Gb-7.5 Gb, depending on requirements.
- Sequence output should generate accurate base calls and high error free reads with greater than 80% bases withhigh quality Q30 score at 2x150 bp read length, derived directly from intensity data and not from a reference sequence-based, multiple-color encoding scheme.
- Clonal amplification of DNA template should be fully automated on the sequencer, without the involvement of emulsion PCR.
- The system should be offered with integrated paired-end fluidics on the instrument, supported with fully automated paired-end chemistry, without user intervention.
- The sequencer should facilitate the sequencing Amplicon, targeted RNA, small RNA, and targeted gene panel sequencing.
- The system should have an option of integrating with a cloud-based computing environment, for data storage, sharing and analysis.
- The sequencing chemistry should be robust and globally proven, demonstrated with over 5000 peer reviewed publications.

- System should offer the user-friendly sequencing experience, such as, intuitive touchscreen user interface, RFID tracking and pre-mixed/pre-filled integrated reagent cartridge for minimal user intervention.

- For Library QC need to provide the fragment analyzer along with the instruments. Instrument should have capacity such application like: CRISPR QC, Total RNA QC, DNA Primer QC, PCR Product check, Genomic DNA&NGS QC Etc.
- For running the NGS machine below accessories instrument will be supplied along with the instrument.(Workstation for Data storage and processing: 16GB RAM, 8 Core Processor10 TB Storage, Magnetic stand-96 well plate(Ambion), Magnetic stand 1.5/2 ml tubes(DynaMag 2), Vibration free table,Qsep1 Plus DNA Analyzer UPS (5 KVA) 30 Min back, Benchtop centrifuge with rotor (for Microplate and MIDI plates), Qubit Fluorometer,Vortex mixer for tubes and 96 well plate, Dehumidifier for sequencing room).
- Instrument should have five years comprehensive warranty.
- Free installation and application training to be conducted for training users.

23. Sanger sequencer

- Instrument should be fully automated multi capillary, fluorescence-based genetic analysis system to process multiple samples in single run.
- Instrument should be a bench top instrument to support various applications like: Genomic Sequencing, de novo/re-sequencing, Gene Expression, Targeted Sequencing (Variant Validation) and Microbial Identification, MSI, Fragment analysis applications.
- System should have 8Capillaries operating in parallel with auto spectral calibrationand the system should have the feature to be upgraded with a higher number of capillaries i.e., 24 cappilay when needed
- System should be capable of supporting 4 plates; 386 and 96- well standard & fast plates; 8-strip standard & fast tubes
- System should have Cooled CCD detection technology and a spectrograph for color separation
- System should be enabled for remote monitoring via a mobile device or networked device & remotetroubleshootingallows for remote monitoring and data visualization for faster resolution, and onboard learning center.
- System should have Flexible connectivity via Local Area Network (LAN), Wi-Fi, USB, and is LIMS compatible.
- The system should have options to detect and analyze 8 fluorescent dyes simultaneously
- System should be enabled with one-button start up.
- System should facilitate continuous plate loading and sample reprioritization feature with walkaway operations for 4, 96/384 plates.
- The system to utilize a single line 505nm Solid-State long-life laser utilizing a standard power supply and requires no heat removal ducting
- System should have the capability to generate “virtual filters” for fluorescent detection to readily accommodate new dyes and applications as they become available without requiring changes in the optical hardware.
- System should be enabled with Radio-Frequency identification technology to tracks key consumables data without the use of any external Barcode reader.
- Software for secondary data analysis should come from original equipment manufacturer.
- System software allow real-time data quality evaluation providing immediate access to base-called or size called data to make decision about the quality of data as it is generated.
- System should have on-board computer and integrated touchscreen enable stand-alone instrument control, data collection, quality control monitoring and auto-analysis of data.
- System should be compatible with a desktop or cloud application for creating and sending plate files directly to an instrument for enabling remote functionality.
- Sequencer Software should provide reference-based analysis of sequencing reactions for mutation detection and analysis, SNP discovery and validation, sequence confirmation. Software for variant analysis should be reference based and non-reference-based analysis of sequencing reactions for mutation detection and analysis, SNP discovery and validation, and sequence confirmation.
- Fragment Analysis software should be a flexible genotyping software that enables DNA sizing and quality allele calls. This software should specialize in fragment analysis and sequencing applications like multi-application functionality including Amplified Fragment Length Polymorphism (AFLP), Loss of Heterozygosity (LOH), microsatellite, SNP genotyping analysis.
- System should have the capability of Security, Audit and Electronic signature features that assist with certain 21 CFR Part 11 requirements.
- The vendor supplying the instrument should have own application support laboratory in India for local & efficient after sales service-support.

24. Digital PCR System

- Table Top Model with advanced technology of droplet/ Chip based PCR quantitation
- System should perform Absolute quantification of nucleic acids with high precision without use of reference genes as well as standard curves

- System should be able to :
- Perform Whole-Cell analysis workflow
- Detect rare DNA target copies with high sensitivity,
- Determine SNP mutation with high sensitivity
- Perform absolute quantification of nucleic acids with high precision and sensitivity without the use of reference genes as well as standard curves.
- Determine copy number variation with high accuracy
- Measure gene expression level with high precision.Perform NGS Validation and library quantification
- Should have water-oil emulsion droplet generator/ physical partition / microchamber with microfluidics technology.
- System should generate 20000 or more uniform Nano litre droplets/ partition per sample. Should generate consistent partitions across users & runs.
- Sample size – 25 microliter or less.
- Sample capacity – minimum of 8 samples per run.
- Dynamic range should be 4 orders or more
- System should be suitable for counting PCR positive and PCR negative partitions, with anoption of recovering the samples after thermal cycling for any other downstreamapplications. Compatible for 96- deep well plate and should be capable of analysing 1 to 96 samples in one go
- Two channel detection for FAM (Evagreen) and HEX (Vic) dyes, with capacity to detectmore than 5 markers in a single well and should be upgradable for 10 or more target Multiplexing from a single well.
- Sample illumination/Detection method: System should use two light emitting diodes forillumination and differentially detect emission/ photograph using two filtered multipixel photon counter/ CMOS camera
- Able to read multiplexing assays run with probe based as well as dye-based chemistry.
- Gradient feature to be available in the system to run samples with different annealing temperatures
- Software package used for digital PCR system should be latest one to be freely used in different computer systems, should not use any reference dye to detect and count positive and negative droplets to avoid bias. Should not require manual setting of exposure & camera gain for the optics bench during run set up to avoid run to run Variation.
- The reader must be able to read fluorescence data from each single droplet / partition individually
- More than 8000 Publications in reputed international journal as proof of technology
- More than 75 installations in India of the Product quoted with more than 15 in clinical setup

25. Storage cabinets for specimens

- The equipment should be made of high grade non corrosive stinless steel.
- It should be possible to store a minimum of 400 specimens.
- It should have an in built exhaust facility.
- It should have vacuum cleaning system
- It should be a floor mounted model with a height not exceeding 6ft

26. Bone decalcified

- Suitable for use in Histology for decalcification of the bone tissue by electrolytic action for easy and precise sectioning. Through the combination of heat & fluid agitation, this instrument provide a method of decalcifying bone in preparation for sectioning & cellular staining. Decalcification is completed in significantly reduced time as compared to manual process, to ensure good staining characteristics. Nitric or Hydrochloric acid of not more than 5% conc. is generally used.
- Basket movement is provided by an electric motor, which raises & lowers the basket and concurrently rotates it at slow speed for thorough solution action.
- A heating jacket vessel in the base of the support-stand heats the solution. Digital Temperature Controller with Display is provided with timer for accurate control of solution temperature. Supplied complete with plug & cord, the units is suitable for operation at 220 V, single phase, 50 Hz, AC supply.

27. Bone Cutter Machine

- The equipment should be independent floor standing with ‘C’ shape construction.
- Body Frame should be CRCA Powder Coated after 7-Stage Phosphating Process for very high scratch resistance & long life.
- Sheet metal should be fabricated on CNC machines for Fabrication accuracy, reliability & finish.
- All welding should be TIG/MIG.
- Cutting Table should be made of thick stainless steel sheet grade SS304 with heavyfor firm, smooth, jerk free movement.
- Size of Cutting Table should be 785 x 585 mm,±10mm approx.

- Total Table Travel should be about 1245 mm ±10mm,
- Size of Extension Table should be about 455 × 760 mm ±10mm.
- Motor Capacity: 1 H.P
- The system should have strong blade that can cut thin bone slice.
- Low vibration.
- Following Certifications are required mandatorily with the Bid:
  - CE (European)/ ISO 9001:2015/ISO 13485:2016 for Medical Devices
  - WHO-GMP /US FDA/ISO 14001:2015 Environment Safety
- To be supplied with blade, electrical cord and hospital-grade plug.
- Suitable to work on 220V, Single phase, 50 Hz AC supply,

28. Tissue Flotation Bath

- Rectangular water bath for flattening paraffin tissue sections
- Ergonomic design ensures maximum user-friendliness and easy cleaning
- Should have Digital display membrane keyboard
- Temperature range from ambirnt to 70`C, set value memory (Battery back –up
- High temperature consistency (control accuracy 0.2`c)
- Working temperature above +44`c indicated by flashing LED. Set temperature displayed in. addition to actual temperature.
- Jet black aluminum surface with special scratch –proof plastic coating ensures highest thermal conductivity conductivity.
- Dimensions (WxDXH) 308x340x95mm
- Dimensions: 12.13x13.39x3.74 inches
- Voltage : 220-240V/50-60Hz
- Should have at least 5-10 Installations in East India
- Should have CE certificate.

29. Slide Warming Table

- Rectangular flattening table
- Ergonomic design to ensure maximum user-friendliness and easy cleaning
- Digital display
- Membrane Keyboard
- Temperature range from ambient to + 70`c, set value memory (Battery back-up).
- High temperature consistency (control accuracy approx. 0.2`c)
- Working temperatures above +44`C indicated by flashing LED.
- Set temperature displayed in addition to actual temperature.
- Jet –black aluminum surface with special scratch –proof plastic coating ensures highest thermal conductivity.
- Slide capacity approx 60 slides
- Dimensions (WxDxH) : 308x340x95 mm
- Dimensions (WxDxH): 12.13x13.39x74 inches
- Voltage : 220-240 V/50-60Hz
- Should have CE OSO Certifcate
- Should have at least 5-10 installations in East India

30. Electron Microscope

- High Resolution TEM (Transmission Electron Microscope) which should have latest, state-of-the-art design & technology, is intended for use for characterization of nano, micro to macro areas of samples of mainly biological / biomaterials, and other types for investigating the internal structure of cells etc. The TEM system must come with robust system enclosure for entire system for better stability against any environmental interference and must have constant power lenses design for extreme beam stability. The system must have dedicated feature and set up to collect electron diffraction data from nanocrystals, for determining the structure of chemical compounds, peptides, and proteins, as one of the key applications.

- **The system should have minimum specifications as given below:**

- Essential specifications
- Accelerating Voltage: 40 – 120 kV in steps or continuous increment, with automated alignment on at least 80kV and 120 KV
- Thermionic electron source (LaB6 or W-filament)
- The system should have constant power objective lens to deliver optical stability and mode switching.
- System should have an acoustic enclosure to enhance stability in performances.
- The system should have a complete oil free pumping system. Dedicated pumping for gun, column, camera and specimen loading should be available as standard.
- b. Resolution:
- Line / Lattice resolution: 0.2 nm or less
- Minimum magnification – 25 x or less
- Maximum magnification –600,000 x or more
- Low Dose Imaging shall be standard and Electron.
- Dose should display on PC screen.

- Eucentric tilt:±90° or more. Tomography software with complete software package for TEM, shall be provided as standard. A separate Tomography holder (in addition to single tilt holder) with tilt angle of ±90° shall be provided as standard.
- The system must have dedicated feature and set up to collect electron diffraction data from nanocrystals, for determining the structure of chemical compounds, peptides, and proteins, as one of the key applications.

- Vacuum system
- a. Must have fully automated clean ultra-high dry differential pumping system to maintain vacuum of electron gun, column, specimen chamber and camera using Oil free Turbo molecular pump and scroll pump.
- b. Pumping time from start to ultimate vacuum should be less than 30 minutes
  c. Vacuum recovery time after specimen exchange should be less than 3 minutes
- Illumination system
- a. Electron source: Should be able to use both Lab6 and Tungsten filament
- b. There should be automated electron gun control and alignment
- All apertures should be motorized, and PC controlled with no manual alignment involved.
- Specimen stage
- Fully computer controlled eucentric high stability stage with side entry holder. TEM shall be fully covered with box type cover to prevent any environmental interference and better stability.
- b. All stage controls in easy reach of operator with co-ordinate recall facility shall be standard feature
- c. Drift < 1nm/minute with standard holder
- d. Specimen movement: X=Y= ± 1mm
- Specimen stage software should be equipped for accurate specimen position recall and retrieve facility.
- e. Anticontamination device with long storage liquid nitrogen dewar of 24 hours should be provided
- Specimen viewin
- Fully remotely controlled with all images in TEM mode directly on PC monitorand the complete,

- Image acquisition
- High resolution bottom mounted Peltier cooled CMOS camera of minimum 16 mega pixel(4Kx4K) with full integration into TEM software and allowing fully automated alignments and image corrections.
- The camera should be retractable with a minimum pixel size of 14 µm or better.
- The camera should be optimised forautomatic collection of electron diffraction data from nanocrystals, for determining the structure of chemical compounds, peptides, and proteins, as one of the key applications (Micro ED).
- b. High speed camera link digital interface for camera data transfer and control
- c. User friendly imaging software integrated with the TEM system software with standard metrology tools including linewidth and area measurements
- d. Software must have digital montage feature for seamless low power image acquisition
- e. Configuration for computer server should be optimized for intensive computational image processing and large data storage files
- f. With the electron microscope - Latest workstation with at least 12 Core dual processor (Intel Xeon Sky Lake) with 1 TB SSD and 8 TB Hard drive. A minimum 256 GB RAM and 30-inch 4k monitor, to be provided with pre – loaded licensed software.
- g. In addition, two high end workstations with Pentium core i7 processor 3 giga Hertz with 64 GB RAM 1TB SSD, 4 TB hard disk drive, Dual high resolution flat panel monitor (27 inch or higher) with high end graphic card having discrete graphic memory of 2GB or more, Gigabit network card and 6 or more USB 3 ports, latest and original Windows OS, 64 bit with pre –loaded licensed softwares. Original antivirus. A3 size photo printer with ink tank technology.
- Local Supply
- 7 kVA online UPS for TEM and 8kVA online UPS for water chiller with power back up for at least 1 hours for the

entire system

- Two nitrogen gas cylinder with high quality regulators and tubing
- Equipment and power supply connector should be compatible with Indian power supply system

➢ Accessories

- a. Single tilt grid holder – One no.
- b. Liquid Nitrogen Container: 50 ltr.
- c. Lab6 filament – Five nos.
- d. Tungsten filament – Ten nos.
- e. Essential tool kit for first level maintenance
- A technique intended to reduce specimen damage by the electron beam should be quoted. This technique should help the microscope operator in minimizing the electron dose needed for the total sequence from searching for specimen areas, through focusing, to the final exposure.The technique should have three states, Search, Focus and Exposure, which have independent settings for various electron optical parameters such as spot size, intensity and magnification.

➢ Calibration Standards

- Standard samples for resolution & magnification calibrations.

➢ Warranty

- 01 year from the date of successful installation and commissioning

➢ Future Upgradation

- The complete system should be flexible enough to be upgraded on site with various hardware accessories & software in future as and when needed.

➢ Installation, Commissioning & Training

- The installation, commissioning, and demonstration of complete system to be carried out by the supplier at free of cost. After successful installation and commissioning, on-site operational training for the deputed personnel to be provided for required days at no additional cost.

➢ Pre-Installation requirement

- Pre-installation details, such as, room, floor plan, size, electrical requirements, and electromagnetic influences & vibration levels etc. should be sent immediately after the placement of the order and the installation site should be measured physically to check it's suitability by the vendor. A copy of that needs to be enclosed along with the tender bid. Necessary environmental requirements, i.e. temperature, humidity etc. during the operation (and unused hours) of TEM should be specified clearly.

31. Ultramicrotome

- Cutting transmission should be done by vibration decoupled gravity stroke.
- Specimen feed at steps of 1 nm or better.
- Cutting speed should be controllable in a range of 0.1 to 100 mm/sec.
- Complete system should be controlled by a touch screen controller of size 10" or more.
- Knife stage should be fully motorized and controllable by the touch screen controller.
- Movement range of knife stage in E-W (X) and N-S (Y) directions should be motorized and at least 25 mm & 10 mm respectively.
- Countdown, section counters, speed, feed, stage movement parameters should be visible on controller screen.
- Details of user, sectioning, knife parameters and grid box parameters should be downloadable via USB (logbook).
- It should be possible to make segments of knife and it should be approached automatically.
- Ultramicrotome should have automatic trimming function, programmable by the touch controller.
- Stereomicroscope with magnification range of 10x to 75x or more should be provided.
- Ergonomic wedge with adjustable angle of 5°- 25° should be included with stereomicroscope.
- There should be multiple LED illuminations with top light, back light and specimen trans Illumination.
- All Illuminations should have independent control via touch screen controller.
- Glass Knife maker should be provided along with system.
- It should work on the principle of 100% balanced break method.
- It should break glass from 6.4 to 10mm.
- It should have variable scoring lengths with accurate glass strip positioning and drawer system with convenient and safe knife removal.
- Auto reset of breaking and scoring mechanism.
- Push action score for even scoring and Adjustable scoring pressure.
- Breaking wheel with scale for defined and reproducible glass break.

Specifications for Critical point dryer:

The critical point dryer (CPD) should utilize supercritical CO_2 to dry samples without altering physical structure for imaging applications.

- The system should have compact design with no additional periphery such as controllers, pumps, or a disposal box for exchange liquids.
- The CPD should have intuitive and easy-to-use software that guides the way for the user.
- High strength stainless steel specimen pressure chamber and solvent resistant housing.
- Chamber lid with screw thread.
- The CPD should have chamber lock detection system via magnetic sensor.
- Front and top sight-glass with LED illumination.
- The CPD should have various specimen holders for high sample throughput.
- Flexibility in sample size and large variety of sample holders (fine mesh holder, filter disc and porous pot holder and glass slide holder)to allow the user to precisely adapt the CPD to the application needs.
- The CPD should have Teflon fillers (1/3 and 1/6 volume) reducing the process time and CO_2 consumption.
- Computer-controlled operation through an intuitive and easy to use integrated touchscreen interface.
- The system should be capable of storing the program to ensure reproducibility. The program with all parameters should be loaded from the library and rerun on a series of samples.
- All the process parameter and processing time should be displayed.
- Estimated processing time is calculated and displayed based on selected processing parameters.
- Should have integrated waste separator to avoid direct user contact with waste materials and to facilitate easier waste disposal.
- Integrated refrigerator with environmentally friendly cooling agent for low CO_2 consumption.
- Cooling range adjustable from 5°C to 25°C and heating range adjustable from 33°C to 43°C.
- Magnetic coupled stirrer for good mixing.
- CO_2 inlet and outlet filters should be external to the chamber for easy access when cleaning or replacement are required.
- Should have safety feature of software-controlled pressure/temperature cut-off and included burst membrane.
- CPD should have empty CO_2 cylinder threshold to save samples and runs to be resumed if a new CO_2 bottle is needed during a process.
- Integrated storage drawer to store sample holders and accessories.
- Software updates available via USB connection.

Specifications of automated tissue processor:

 Internal body should be made of stainless steel.
 Rotatable table should be capable of holding reagent vials 24 no. or more at once.
 Automatic agitation of the sample should take place for selected reagent.
 Vials should remain sealed while not being used for agitation.
 Sample holder should have provision to hold multiple samples at once.
 Complete system should be controllable with a touch screen controller.
 Real time adjustment of software steps during a processing run, allowing pause and resume to adjust for new information or schedule changes.
 Programmed and real time temperature readouts, for ensuring appropriate thermal gradients and transition times.
 Customizable reagent list so users can edit and rename program steps.
 User selectable agitation, for variable sample infiltration requirements.
 It should be possible to prepare programmes and have memory for 20 or more programmes.
 Programmes should be exportable via USB connection.
 It should be possible to make changes in programme during the working process as well.
 Delay time should be selectable for start as well as end time.
 Parameters should show the real time values during the process.
 Working area should be sealed while working and have an exhaust outlet for fumes.
 A preheating and cooling unit should be integrated with temperature range of +4°C to +60°C.
 On power failure system should keep the sample in reagent without drying.
 All accessories like sample holder, sample baskets, vials etc should be provided with equipment.

Specifications of gird plunger:
 Movable climate control chamber with automatic adjustment of temperature from 4º C to 60º C or better as well as humidity up to 95% or better.
 Climatic chamber should be well lit inside with LED and a defogger/window heater should be available to prevent fogging and maintain a clear view of chamber.
 Should be capable of sensor-controlled blotting.
 Should have automated single, double and multiple blotting.
 Fast, easy, and safe filling of the secondary cryogen with the unique liquefying head.
 Digital controllable secondary cryogen temperature within 1 degree.
 Windows for inserting pipette should be available on both left as well on right side of the chamber.
 Touch screen control panel to program and run the system with easy-to-use graphic user interface.
 Possibility to set & adjust pre-blotting, blotting/hold time.
 Positioning of grid should be adjustable in terms of distance and height with respect to the blotting paper.
 Fixed cryogen container for plunge-freezing the sample.
 Should have safety alarms - error messages and audible alerts.

 Required accessories like grid box, insulating forceps, blotting papers etc. should be provided along with the equipment.

32. INTEGRATED FULLY AUTOMATEDHISTOPATHOLOGY WORKSTATION

A. CassetteWriter

- Should permanently mark tissue cassettes.
- Should be computer based micro-writer.
- It should print letter, numbers, roman numerals, special characters, bar codes, and QR codes.
- It should have the capability to handle a high-volume work of approximately 2,50,000 cassettes per year.
- Printed barcodes on the cassettes should be readable on the Automated Embedder.
- The printing media type should be either thermal transfer ribbon or inkjet/bubble jet cartridge.
- Number of cassettes that can be printed perribbon/cartridge to be mentioned.
- One thermal transfer ribbon/printer cartridges to be provided in a staggered manner over a period of one year and their price to be frozen for next10years.
- It should be compatible with barcode scanners/readers of any type.
- Use of all type of Cassettes with different write-able surface angles (25°–45°)including para form cassettes for Automated Embedder.
- Should have at least 6 loading magazines with achmagazine should load atleast 70 cassettes.
- Should print at least15cassettes per minute in a batch printing.
- Printqualityshouldbe300dpi or more.
- Unloader of the cassettes once printed should be integrated with the machine.
- The printer should be able to connect to all Windows software and laboratory information system.
- Should provide latest technology & compatiable computer with machine .
- A UPS backup of minimum 30minutes should be supplied with the instrument at no extra cost.
- It should conform to USFDA/CE European/BIS certification to ensure safety quality and reliability.
- Should work on 200-250V,50-60 MHZ.
- Should have a 3years warranty from the date of installation.
- CMC for 4 Years after the warranty period of 3yrs.

B. Automated tissue processor

- Should be fully Automated rapid, continuous tissue processor using xylene free and formalin free reagents.
- Color touch screen and full graphical key board for user convenience.
- Should have Indicator Lights for Power on ,Auto Start/Shut down, System Status.
- Should have Process Capacity of continuous loading of upto40 cassettes.
- Through put of Up to 120 cassettes per hour and the cassette magazines should be compatible with the fully automated Embedder.
- Robotic arm moving from station to station in the X-Y plane, with automatic opening and closing of the station lids.
- Should have four Retorts with computer controlled lids.
- Should have a dedicated load and unload stations for user convenience.
- 2UnloadStationswithcomputer-controlledlidand1removablecontainer.
- Program Memory to support standard and Extended processing protocols.
- Should work in combination of Microwave for Dehydration, clearing and Vacuum for paraffin impregnation.
- Parameters like Institution name, start/shutdown, procedure, cassette/run count, loading procedure, UPS, print-outs, user-defined report sort, date/time formats, alarm volume/tone, key soundon/off.
- Start-up to be lessthan1hour, 4hoursfromcoldstart.
- Password Protection of Up to4Administratorand20Operators.
- Should have an option for Fume Control with disposable carbon cartridge.
- Fixation and Dehydration should be formalin-freeen suring the safety of lab staff.
- Clearing and Impregnation should be xylene-free.
- Easy to use reagents and convenient disposable packaging, including bottle connectors.
- Operational Temperature 15 °C to 35 °C, Operational Relative Humidity 30% to 85% (no condensation)and OperationalPressure70k Pa to106k Pa.
- Data Interface consisting of LAN connection, USB port, automatic and on demand printouts, import/export to external PC.
- Audible alarm tones with tone and volume adjustments, screen display messages.
- Diagnostic Functions: Self diagnostic, error messages and codes, error list and log, PC connection.
- Should work with regular power requirements of 220-240VAC,50/60Hz.
- Should be USFDA and CE/BIS approved system.
- Provision of battery back-up or UPS of appropriate rating in case of power failure (1½hour)
- Essential Consumables
  - Paraform Cassettes to be provides–1,00(40%-standard size,30%biopsy size and 30%biopsy13x13 size)
  - Paraform tissue orientation gels to be provided-100(2-lane-40%,3 mm punch-30%, 2mm punch-20%,biopsy-10%),
  - Cassette basket with handle(1innumber)

- Basket transport tray(1innumber),
- Reagents used for automated tissue processor(1 containers of each),
- Price of consumables to be quoted separately and frozen for 5 years

C. Automated tissue embedder

- Should be a fully Automated Walk-away station.
- Should have Continuous loading of up to 80 cassettes of 4 magazines of 20cassettes each.
- Loading magazines should be compatible with the Tissue Processor of same manufacturer.
- Should have a through put of upto120 blocks per hour.
- Paraffin chamber should have capacity of minimum 5liters.
- Autonomy of up to 1,200 blocks for 8 hrs of continuous operation with ultrasonic level sens or for level detection.
- Paraffin chamber temperature should be factory-set temperature of 65°C (149°F) to have standardized embedding.
- Should have 4 stations for loading processed cassettes one magazine of up to 20cassettes per station, cassettes are stacked and held in place by a sliding cover and retainer in each magazine.
- Unload stations of 4 stations of 20 blocks each with four removable doors serve as convenient carrying trays.
- Process time with less than 5 minutes per cassette, after user defined warm up should be available.
- User-defined parameters with Institution name, start/shutdown procedure, cassettecount, print-outs, user-defined report sort, date/time formats, alarm volume/tone, keysound on/off.
- Start-up should be less than 1 hour,4 hours from cold start.
- Password protection of Unlimited administrators and operators.
- Should have Color touch screen, full graphical keyboard with 15inches diagonal.
- Data interface with USB Type A ports & LAN ports.
- Audible sound patterns with user selectable tones, volumes, and screen display messages.
- Diagnostic functions like Self-diagnosis, error messages, codes, error list and log with USB connection.
- Should work with regular power requirements of 220-240VAC,50/60Hz.
- Should have Integrated PC and distributed controllers.
- Should operate at 15°C to 30°C (59°F to 86°F) and relative humidity: 30% to 80%(non-condensing).
- Should be USFDA and CE/BIS approved system.
- Essential Consumables:
- Cassette magazine(5),
- Embedding medium(3 x1kg packets)
- Slide racks(5)
- **Price of consumables to be quoted separately and frozen for 5 years**

D. Automated slide labeler

- It should print directly onto glass slides/ charged slides of standard size (25mm X75mm) at the frosted ends.
- Print technology: thermal transfer/inkjet.
- The ink should be chemical resistant (xylene/alcohol/water).
- It should print letter, numbers, roman numerals, special characters, bar codes, and QR codes.
- A compatible bar-code scanner which it able to scan 1-D as well as 2-D codes (QR codes) should be supplied.
- Data interface to be through USB 2.0 and should be able to interface with laboratory information system.
- Working temperature range should be 15-35ºC.
- Through put of slides at least 8 slides per minute in serial mode (monochrome).
- Print resolution –minimum 300dpi.
- Magazine capacity-to hold at least 100 slides.
- Should be provide with a compatible computer system (monitor, keyboard, compatible softwares -full versions).
- Unload tray capacity- at least 15slides.
- Should be USFDA and CE/BIS approved system.
- Essential Consumables:
- Slide labeler cartridges (2: in a staggered manner) to be given with instrumentandtheirratestobefrozenfornext5 years.

E. Fully automated microtome

- Fully automated drive by wire microtome with Blue tooth remote control
- Mechanic of Microtome: Continues mode; Single section mode; Rock Mode; Trim Mode; Auto align, Auto Trim removes predefined amount of paraffin from block in 10 seconds and Auto Section Technology.
- Left and right handed personnel.
- Horizontal and Vertical Rotation:0-5°(Automated) and0-90°(Manual)
- Cutting Range:0.5–100µm.
- Cutting Speed:10–450µm/Sec.
- Display: colour LCD with touch screen.
- Driving Mechanism of Microtome: Retracting (20-100 µm; also should be set to non-retracting).
- Type of specimen Holder or Clamp: quick release for regular Tissue cassettes motorized 3D Chuck with automatic block face alignment to the blade.

- Block home position to be clearly identified.
- Specimen feed Speed:1300 µm/Sec.
- Specimen retraction range:1 –100µm.
- Sectioning Thickness:
- Cutting Range:0.5–100µm.
- Trimming Range:1 –200µm.
- Vertical Cutting Stroke:13mm,25mm,35mm,70mm
- Sectioning Mode: Single Section, Continues Section, Rock Mode; 16 programmable (Including Block size, speed, thickness),Sectioning protocols, each having15steps.
- Types of Microtome blade: Disposable(Low-High profile).
- Can be used with both standard cassette and paraform orientation cassette types
- Should optimizes and standardize sectioning for each tissue types with programmable sectioning.
- BladeAngleAdjustment:0-10°.
- Primary instrument safety features: blade guard, emergency stop button, wheel locks.
- Data interface USB 2.0
- Should have CE/BIS and US FDA approved.

F Auto stainer

- Instrument should be compact, modular and completely covered to preventhazard
- Roboticarm for X-Y-Z directional movement to pick and shift slide racks.
- Total loading capacity of minimum 240slides.
- Minimum total through put of at least 350slidesperhour.
- A barcode reader should in-built to read the barcodes on slides printed by the automated slide printer.
- The machine should be programmable, so that multiple racks (at least 11 slide racks together if necessary , each rack accommodating 30-40 slides)can be run

33. Digital Incubator

- Digital Microprocessor PID based Temp. Controller-cum-Indicator.
- Large LED display easy-to-read from distance.
- Platinum RTD Temp. Sensor.
- Setting temperature range: Ambient to 80°C ± 0.5^0C
- Must have Kanthal Air Heating Elements.
- The system should have electric overload safety with MCB facility.
- Easy-to-clean, corrosion-resistant construction.
- Outer Body should be CRCA Powder Coated after 7-Stage Phosphating Process for very high scratch resistance & long life. Inner chamber should be made of highly polished stainless steel SS 304 grade.
- Capacity: 125 Ltr. Approx.
- Inner chamber dimension should be 455 x 605 x 455mm ±10mm.
- Door should be insulated and fitted with 'C-Profile' gasket for air tight closing for no temperature loss. Door should have view-window of toughened glass empaneled in door frame.
- Door should be provided with lock and key.
- Should have Air Circulating Fan for providing homogeneous temp. in the chamber.
- Should have Air Vents on both sides to ventilate fumes.
- A Back-up Safety Thermostat must be provided.
- Insulation: CFC-free, High Density, Low Conductivity, High Temperature Mineral Media.
- No. of Shelves/Trays: 3
- The space between the shelves in the chamber should be adjustable. Shelves/Trays should be made of Stainless Steel. The trays/shelves should be perforated.
- Following Certifications are required mandatorily with the Bid:
- CE (European)
- ISO 9001:2015
- ISO 13485:2016 for Medical Devices
- WHO-GMP
- US FDA
- ISO 14001:2015 Environment Safety

34. Spectrophotometer:

- Microprocessor based UV-VIS Spectrophotometer with high resolution touchscreen display, for operation on 220V / 50Hz.
- Stand-alone operation as well as complete control through PC with PC software supplied as standard

- True double beam optics with aberration corrected concave blazed holographic grating in Czerny – Turner mounting for high energy throughput and high quality monochromatic light
- wavelength range of 1,100 nm to 190 nm
- resolution 1 nm spectral bandwidth over entire wavelength range
- Wavelength setting and display in steps of 0.1nm
- Wavelength accuracy of $\pm$ 0.1nm for D_2 spectral line
- Wavelength reproducibility of $\pm$ 0.1nm
- Wavelength Slew rate: approx.. 29,000 nm/min
- Variable wavelength scanning speed: ≥ 3,000 nm/min to 2 nm/min 29,000 nm/min when survey scanning
- stray light of <0.02%T at 220nm with NaI filter
- Photometric range of -4 to +4 Abs and 0 to 400 %T
- Photometric Accuracy of $\pm$ 0.002 Abs at 0.5 Abs
- Photometric Repeatability of Less than ± 0.0002 Abs at 0.5 Abs
- Baseline stability: < 0.0003 Abs/Hr (700 nm, one hour after light source turned ON)
- Ultra low Photometric noise of < 0.00005 Abs (700 nm)
- Dual source – high intensity Tungsten-Halogen and Deuterium lamp with automatic changeover
- High sensitivity matched pair Silicon Photodiode detector
- 4 USB ports or more for high speed PC and printer connectivity, data storage and transfer through USB pen drive
- Guaranteed compliance with all Pharmacopoeia requirements
- Built in validation program, diagnostic and security functions
- The instrument should provide network access via wireless connectivity. Data can be transferred to a PC via a network
- The instrument should have provision for Bar code reader and key board entry function: sample names and numerical values can be entered by a bar-code reader or from the keyboard
- The instrument should have Sleep mode and wake up function: Analysis can start the instant the user arrives at the laboratory. The instrument should require no time to warm up.
- All operational modes as standard – Photometric; Spectrum; Quantitation; Kinetics, Time Scan, DNA and Protein Quantitation in stand alone and PC mode. Additionally Multi-Component measurement available in stand-alone mode.
- Large sample compartment compatible with wide range of accessories.
- Must supply one pair of 10mm path length Quartz Cuvettes of 3.5 ml volume & 0.25 ml volume of Quartz cuvettes – 1 pair
- 12 months warranty from the date of installation

35. CENTRIFUGE

- The equipment should have the following features
- Table Top version
- Tube capacity: No.24-36:Size 5-15 ml
- Digital timer
- Strong fabricated & corrosion resistant steel
- Control panel- for start/stop switch, dynamic brakes, step less speed regulator with zero start switch& sped indicator with timer & protective fuses
- Door interlock
- Maintenance free brushless drive motor with exact speed pre-selection & display. Speed range: 100 to 10,000 rpm & above, accuracy 1 rpm
- Centrifuge complete with Swig 7 basic rotors & four buckets- 01 set
- Power supply: power input: 220-240 VAC, 50Hz

36. ULTRA CENTRIFUGE with rotors and accessories

- Centrifuge should have the following control specifications
- Maximum RCF (x g): 800,000g or more
- Speed Control: ±2 rpm of set speed
- Set Temperature: 0 to 40ºC in 1ºC increments
- Temperature Control: ± 0.5ºC of set temperature
- Temperature display: Actual rotor temperature in 0.1°C increments
- Large touch-screen display with adjustable positions
- Drive type: Imbalance tolerant direct drive, eye balance to within 5 mm,
- Refrigeration system: Thermo electric temperature control system and non coolant based.
- Vacuum system: Moisture purging / Moisture removal system
- Temperature range should be from 0 Degree to 40 degree with 1 degree increment.
- Ambient operating rage should be 10 to 30*C
- Acceleration / Decelerations profile: 10/10 or more
- System should come with color large LCD touch screen operation for RPM / RCF / Temp. / Time (Run / Hold) / Vacuum display with error alarms.
- Convenient rotor catalogue and rotor tracking by serial number
- Simulation software feature must be there which can provide Sedimentation Coefficient & Protocol Optimization before the experiment run.

- Rotor Specific Requirements:
- Fixed Angle Titanium Rotor:
- Rotor Max Capacity:12 x 38 mL or more with 300,000 x g or 50,000 rpm
- Rotor k-factor: MUST BE 70 or less
- Polycarbonate tube of 30 mL capacity should be able to run at
- 300,000 x g or more. Should include – 100nos
- Polycarbonate tube of 10 mL capacity should be able to run at 175,000 x g or more. Should include – 100nos
- Swinging Bucket titanium Rotor:
- Rotor Maximum Capacity: 6 x 4.0 mL or more with rotor maximum Force of 485 000 x g and RPM of 60,000 or more
- Rotor k-factor: MUST BE 45 or less
- 2 ml or more Sealabale tube should be included. Total Qty-200 tubes. All the tubes should run at a g-force of minimum 4,85,000g and above
- iV. 4 ml Thik wall Pollyallomer tubes -50 nos should be included.
- These tubes should run at 485,000g or more with K factor of Less than 50
- Swinging Bucket titanium Rotor:
- Rotor Maximum Capacity: 6 x 14.0mL or more with rotor maximum Force of 285,000 x g and RPM of 40,000 or more
- Rotor k-factor: MUST BE 138 or less
- 14ml or more Pollyallomer tube and Ultra clear tubes should be included. Total Qty-200 tubes. All the tubes should run at a g-force of minimum 2,85,000g and above
- iV. 4 ml Konical Quick seal Pollyallomer tubes -50 nos should be included.
- These tubesshould run at 2,85,000g or more with K factor of Less than 60
- V. 10 ml Konical Thinwall Pollyallomer tubes -50 nos should be included.
- These tubes should run at 2,85,000g or more with K factor of Less than 125.
- Other Essential Features:
- Drive Cooling: Air-cooled
- Adaptors to accommodate small volume samples without sacrificing the maximum g force of the rotor
- Ability to remove moisture with vacuum
- A solid state thermopile shall monitor the chamber temperature
- Advanced Software features:
- Expert software with inbuilt calculations, simulations and references
- Real-time run graphing
- Powerful on-board simulation and calculation tools
- Vendor should have training and application lab in India for after sales support.
- Suitable 10 KVA servo stabilizer should be provided

37. CO2 Incubator with 4-split segmented glass inner door and accessories

- High Capacity benchtop CO2 Incubator for better stability of temp and humidity system in compliance with GMP requirement.
- Incubator should have Gel Insulation for enhanced thermal stability and uniformity.
- Incubator should have laminar based horizontal airflow management system for better uniformity of temperature inspite of incubator stacked with plates.
- Temp Range: 10°C above ambient to 60°C
- Temperature Control: ±0.1°C
- Temperature Uniformity: ±0.3°C
- Incubator should have GMP compliant Humidity management system without using any water PAN inside. Humidity control using low maintenance atomizer principle would be preferred.
- Water quality needed for humidity must be defined in order to maintain the life of Incubator.
- Incubator should have display for actual humidity and should have active humidification control.
- Humidity Control: Ambient to 95%
- Humidity Accuracy: ±3% RH
- Capacitative humidity sensor
- Incubator should have IR sensor based CO2 control system for precise Co2 control
- CO2 Control: 0-20%
- CO2 control: ±0.1°C
- No of shelf: 3
- Incubator should have 7" Color display for microprocessor based touch control system for easy and precise controlling of parameter
- The controller should be able to display the trend of controlling parameter and have audio/visual alarm facility. It should have also service/calibration due alarm and should have password protection feature of unauthorized acess.
- Should have one acess port for calibration
- Should be stackable for 2 units
- Incubator should have inbuilt 90 degree C moist heat sterilization system for regular operation/decontamination.

- Additionally incubator should also have the dry H2O2 vapour based sterilization system to sterilize the incubator from inside with 12 log bacterial decontamination.
- The H2O2 sterilization should make the incubator ready in dry condition after running a 2 hour long cycle and does not leave the chamber wet that require further drying/wiping of chamber.
- Should be CE certified
- Warranty: 1 Year
- Should quote the optional accessories like gas change over unit, Regulator, CO2 Culinderetc
- Should also quote the provision to drain the water to the drainage system

38. Refrigerated MicroCentrifuge

- **Refrigerated Microcentrifuge:**
- System should have a maximum Speed of 30,130xg /17,500 rpm, with a brushless motor
- Temperature range should be from -11°C to 40°C and should be able to maintain 4°C at maximumspeed
- System should be capable of usingboth fixed angle and swing bucket rotor
- System should be possible to use aerosol tight rotor. Aerosol tightness of rotor should be certified by athird-party agency
- System should be able to accommodate 48 number of 1.5/2mL tubes
- System should have a dedicated rotor for 5 ml tubes to accommodate 5mL conical tubes
- System should have dedicated rotors for 15/50mL conical tubes and MTPs
- System should be supplied with metallic autoclavable rotors and lids
- **System should have an in-built condensate drain to prevent water accumulation**
- System should have fast temperature function for rapid cooling of centrifuge
- **System should have a programmable temperature function to allow automatic precooling based on pre-programmable time and date**
- **System should be possible to store 50 programs with 5 quick access program keys**
- Speed setting should be possible in both RPM and RCF
- **System should be able to start the timer count only when the set centrifugation RPM is reached, to support the short spin protocols**
- **System should possess a separate short spin key for brief spin with user defined speed for brief spinning**
- **System should be possible to program compressor shut off after 8 hours of non-usage of the centrifuge**
- System should have the flexibility to accommodate rotors for different formats of tubes starting from0.2mL PCR tubes up to spin column tubes
- System should have automatic rotor recognition facility to automatically recognize and setmaximum speeds upon rotor change
- Rotor lids should have a QuickLock-system for quick opening and closing of rotor lid
- System should be possible to perform gentle acceleration and deceleration using dedicated key
- System should have lock function preventing program setting overwritten or changing
- System should have menu-driven, multi lingual operation menu with large backlit display
- **System should also have extended display to show the set and current parameters**
- Noise levels should be <54 db(A) for quite operation
- Should have facility to validate speed temp and time with certified device
- System should be EuropeanCE Certified
- System must have an USB-port for service maintenance
- **Rotors:**
- Fixed angle rotor for 30 x 1.5/2.0 mL tubes with maximum speed of 14,000rpm and 20,800 x g
  - Metallic rotor lid with aerosol tight for safe centrifugation of samples
  - Rotor lid must support quick locking during loading/unloading of samples
  - Rotor and rotor lids can be autoclaved
  - Rotor bore must be 45° angle to minimize the pellets smear along the tube walls
- Fixed angle rotor for 6 x 15/50 mL conical tubes with maximum speed of 7,830 rpm and 7,745 x g
  - Metallic rotor lid should be available
  - Rotor and rotor lids can be autoclaved
- Swing bucket rotor for 2 x MTP,PCR and Deepwell Plates with maximum speed of 4,680 rpm and 2,204 × g
  - Metallic rotor with mindshield design for quiet operation

39. Nano Drop

- The system should be a compact benchtopmicro-volume spectrophotometer for accurate quantitation of nucleic acids, proteins
- Wavelength range should be 190-850 nm
- Minimum sample volume should be 1 µL with one sample analysis at a time onto a sample pedestal
- Pathlength: 0.03-1 mm auto ranging

- Should have xenon flash lamp as the illumination source and 2048 element CMOS linear image sensor as detector
- Wavelength accuracy should be ± 1 nm
- Absorbance range (1 cm equivalent): 0-550 A for pedestal mode
- Measurement repeatability: 0.002 A (1.0 mm path) or 1% CV, whichever is greater
- Limit of detection (pedestal): 2-27,500 ng/µL (dsDNA), 0.06-820 mg/mL (BSA)
- Measurement time: 8 sec
- The sample pesestal material should be SS 303 and quartz fiber
- It should have standalone operation with a large 7 in touch screen display
- Instrument on-board software should enable quantitative applications like nucleic acid A260, A260/A280, A260/A230, fluorescent labelled nucleic acids, Protein A280 and Peptide A205, Protein Pierce 660, Protein Bradford, Protein BCA, Protein Lowry, fluorescent labelled Proteins, OD600, UV-Vis, Custom Methods etc.
- The software should have feature to identify the contaminants in the sample and report a corrected sample concentration. It should also detect the bubbles and other anomalies in the sample column. It should provide instant feedback about sample quality with on-demand technical support for guided troubleshooting
- It should also be compatible with a PC based (OS Win 10, 64 bit) control software
- Connectivity: USB, Ethernet, WiFi
- It should be a CE certified model

40. Fully Automated Autoclave

- The operations of the unit should be controlled by a Microprocessor Based Touch Screen Graphic Display Controller.
- The Vertical Autoclave should have Chamber Capacity of 75Ltr.
- Working Chamber Size: 400 (dia) x 600 (depth)
- The unit's Outer Body,Internal Chamber, Cover Lid and all wetted parts should be fabricated from stainless steel of 304 grade.
- Should be fabricated on CNC machines for Fabrication accuracy, reliability & finish.
- All welding should be TIG/MIG.
- The Vertical Autoclave all joints should be smooth finished for crevice free internals.
- Working Pressure: 2.3 kg/cm2
- The Microprocessor Controller should have below listed Essential Functions:
- Touch Screen Controller
- Graphic Display
- Test Details to feed Batch No., Serial No., Lot No., Operator Name)
- Purging Start Temperature Resettable range 0^0C to 100^0C through Solenoid Valve
- Purging Stop Temperature range 0^0C to 25^0C
- Sterilization Temperature range 105^0C to 150^0C
- Sterilization Timer Duration range 0-240 mins
- Final Evacuating Temperature range 0-100^0C
- Alarm Low / High range 0.2^0C to 10^0C
- Printer with interval range 0-90 mins
- Clock
- Log interval 1-60 mins
- Automatic Steam Exhaust after Operation through solenoid valve.
- The unit should be provided with Pressure Control Device.
- The lid should be equipped with Radial Locking with Pedal lifting.
- The lid should be provided with purge valve and a manually operable valve for exhaust.
- The user should be able to set the temperature up to 122^0C in steps of 0.1^0C each.
- The unit should be equipped with Low Water Detection unit and should give Audio- Visual alarm in case of Low Water in the chamber and cut off the supply to the heater.
- The unit should have safety valve to protect the equipment in case of over pressurization.
- The unit should be provided with safety cut-out for high temperature.
- The unit should give indication by audio-visual alarm on completion of set autoclave cycle.
- The Vertical Autoclave should work on the domestic power supply of: 220 V AC, 50 HZ, Single phase.
- Following Certifications are required mandatorily with the Bid:
- CE (European)
- ISO 9001:2015
- ISO 13485:2016 for Medical Devices
- WHO-GMP
- US FDA
- ISO 14001:2015 Environment Safety

- NSIC Certificate should be provided with Bid.
- The following Documents should be provided with supply.
- Instruction Manual
- Calibration Certificate
- IQ/PQ/OQ/ Certificates
- Nominal Voltage Supply: 220V, 50 Hz, Single Phase.
- Nearest authorized service center address and details should be mentioned with documents.
- Warranty: 5 years

41. Walk In Cold Room

- **Description**

- External room dimention : **127.5inch x 70inch x 96 inch**
- 60 mm thick puf insulated panel for wall &ceilling for chiller Room
- Panel specification:- Temperature Range minus 30 deg C to 80 deg C
- Puf Blowing agent:- Cyclopentane (C5)- (CFC& HCFC Free)
- Panel Joint:- Tongue & Groove Joint
- Panel to panel fitment : < 3 mm
- Panel Density:- 40 kg/ m3
- Compressive strength(kg/cm2):- 1.6 to 1.9
- Closed cell content (%):- >90
- K-value(w/m°K):- 0.022
- Global -warming potential is 11 compare to 630 against conventional panel
- Ozone Depletion potential: 0
- 60 mm thick anti skid flooring
- Bitumin&Tarfelt will be used as Vapour barrierin three layer
- Wall &ceilling panel will be joint through flashing material to prevent air leakage
- 78" x 34" x 60mm thick Puf insulated door with auto door closure. Emergency safety realease feature.
- Emergency safety release Hooter
- CFL light inside cold room
- **Refrigeration Unit:-**
- Evaporator Unit :- RUAH01014-I 2 nos(1 w+ 1 std-by)
- Fully Stainless steel body. 3 fans each of 90 watt
- Air throw 12 feet. CFM 2400. Evaporator is with Capilary type expantion Valve
- Air Defrost
- 3 Row & 8FPI Evaporator unit
- refrigeration -cfc free(404a)
- Condensing Unit RUAHOP1014 (1 w+ 1 std-by)
- Condensing unit is with Reciprocating compressor
- sound pressure level@1 m 60 dB (A)
- Supply of copper pipe for suction & liquid line
- Nitrile rubber insulation over suction line
- Copper cable
- Electrical control panel with Microprocessor based controller
- Labour charges for Erection Testing Commissioning

42. ICP-OES

- The instrument should have vertical Dual view (VDV) and radial view (RV) for the purpose of elemental analysis in sample.
- It should deliver measurement over the wide range of wave length range, the vertical torch and new optical design with free form optical technology that enhances sensitivity and resolution.
- All configurations should come with mass flow controlled nebulizer, plasma gas, auxiliary gas and make –up gas. The ICP-OES also includes an Easy –Fit Torch, Double Pass Spray Chamber, Sea Spray Nebulizer, sample and waste pump tubing sample introduction system.

Group-H: Physiology

1: Exercise Physiology System/ Gas analyser

1. Completely computerized cardiopulmonary exercise testing system for humans.
2. The unit should be a compact unit for spirometry and allied parameters, mounted on a suitable trolley.
3. The system should measure VO2, VCO2, RQ, VE, spirometry/ flow volume, etc.
4. Multichannel USB based 04 channel data acquisition unit (includes 02 Bio potential channels) with compatible software to record and analyses at least 24 channels simultaneously.
5. The system should be able to record & measure VO2 oxygen consumption, VCO2 carbon dioxide production, VE Expired minute volume, RER respiratory exchange ratio, ECG, HRV, Body Temperature and pressure saturate BTPS, standard Temperature and pressure dry STPD, (VE/VO2), (VE/VCO2) etc. and should generate a number of graphs like metabolic log window, VE (BTPS) vs. VO2, VE (BTPS) vs. time.
6. Faculty to perform complete heart rate variability analysis (Time & Frequency domains), ECG interpretation, PQRST Amplitudes and ST elevation, cardiac axis analysis during exercise.
7. Non Invasive beat to beat Blood pressure monitoring in Human with Systolic, Diastolic and other hemodynamic parameters like Cardiac Output etc. by finger arterial pressure measurement.
8. Should have a noise free multichannel wireless belts to records ECG, R-R interval, Heart rate, Skin Temp, GSR, Respiration rate, Oxygen saturation, pulse blood flow, Accelerometer activity integrated into the system. Belts of six different size to be provided.
9. The system should be simple blue tooth/RF based easy belt that can be easy wear by the subject.
10. User friendly software for recording, analysis and printing the data, the software should allow calibration of transducers, display of values, controllable gain, filter settings, baseline setting for event marketing and annotation.
11. It should be capable of measuring time interval between user selected points, display of date value at user selected point, editing of the records and re-annotation.
12. Battery life at least 13 hrs.and Memory at least 30 Days continuous/ 8GB.
13. Automatic analysis Feature: Online and Offline ECG (Interval extractions), HRV (Time & amp; Frequency domain), Spectrum, Peak analysis.
14. Compatible i5 Laptop to be provided.
15. Compatible bicycle Ergometer to be supplied with the system.

2: Advance PFT Lab (Spirometer with diffusion DLCO)

Advanced PFT LAB

1. BODY BOX – PLETHYSMOGRAPH

   Body Plethysmography System with facilities to measure the following Parameters:

   1. Spirometry including bronchial challenge test
   2. Thoracic gas volumes (DLCO single breath dilution)
   3. Airway Resistance and conductance
   4. Single Breath Diffusion Capacity of Lungs (DLCO-sb) with Helium (He) or CH4
   5. Intra Breath Diffusion
   6. Maximum inspiratory and expiratory pressures (MIP & MEP), PO.1 and Rocc/Rint.
   7. It should be provided with Forced oscillatory system
   8. Integrated Dosimeter for bronchial Challenge testing should have predefined multistep protocol to use with a single drug concentration
   9. The body box should be standard Aluminum/Acrylic with an internal volume of minimum 700 Liters. It should be transparent with visibility from inside as well as from outside, operable from both sides, equipped with intercom. It should be compatible to use with wheel chair
   10. Should have a ultrasonic or pneumaticspirometer with range, linearity, resistance and accuracy meeting or exceeding American Thoracic Society-European Respiratory Society standards
   11. Resistance/conductance studies by both panting and tidal breathing, Software should allow manual fitting of slope to the data
   12. Dosimeter/Aerosol generation system controlled by software for challenge Test.
   13. Gas analyzers should meet the American Thoracic Society-European Respiratory Society standards for stability, linearity, response time and accuracy.
   14. Calibration and test gases: Gas mixtures for calibration and 500tests; Cylinders should be supplied with double stage pressure regulators

15. Should be supplied complete with Calibration Syringe, Trolley, Software, Manual and Standard Accessories, Pulmonary Filters (1000 Nos); reusable mouth pieces (500), paper mouthpieces adult (1000) and pediatric (500), nose clips (20), and adaptors for mouth pieces; Two sets of cylinders each of helium/CH4 and diffusion gas mixtures will be provided.
16. Should be supplied with compatible branded computer – Intel Core i7, 3.1 GHz, 8 Gb RAM, 21 "TFT Colour Monitor, CDR/W-DVD Drive, Keyboard, Mouse, Hard Disc Drive (1Tb SATA)USB Ports, Windows 7/8, Mobile Cart for control unit, PC Also UPS 1 KVA with battery back-up.
17. Multifunction colour laser printer with copier, scanner with airprint, eprint, automatic document feeder, automatic dual side printing and inbuilt modem.
18. Should have US-FDA & European CE certification.
19. Facility to customize report output.
20. Facility for saving patient data, measured curves and calculated parameters, with quick retrieval from the database.
21. Shall meet IEC-60601-1-2:2001 (Or Equivalent BIS) General Requirements of safety for Electromagnetic Compatibility. or should comply with 89/366/EEC;EMC directive
22. It should work on Power 220 V 50Hz AC.

2. Forced Oscillatory System

It should be able to measure airway resistance through Forced Oscillatory technique at various frequencies from 5Hz to 40 Hz.

1. The unit should be small, portable, suitable for online testing through computer.
2. The unit should incorporate Ultrasonic or pneumatic sensor with no moving parts, which should preferably be auto Cleavable for preventing cross contamination.
3. The unit should have proven spirometry software with automatic test quality control as per ERS standards and trending.
4. The unit should incorporate a hygienic drying fan to remove aerosolized droplets though filter for better efficiency (if needed).
5. The unit should have spirometry Software with children incentive, challenge test, tidal breathing, single breath as well as closed circuit spirometry.
6. The unit should measure the following parameters' VC, FVC, FEV.5, FEV.5%, FEV1, FEV1/VC%, FEV1/FVC%, FEV/PEF, FEV3, PEF, FEF25-75, FEF25-75%, FEF25%, FEF50%, FEF 75%, FMFT, FET, MVVind, FIVC, FIVC/FVC%, PIF, FIF 25%, FIF50%, etc.
7. It should have automatic BTPS correction.
8. The print out should be configurable with choice of curves, parameters printed, interpretations and quality control messages.
9. The unit should be compliant to all standard like ATS, ERS, European CE marked (or FDA Certified).
10. The unit should be supplied along with a Laptop of standard make (HP/Del/Compaq/Lenovo/Sony) –with i7 processor, 8 GB RAM, at least 15" TFT Screen, USB Ports, CDR/W, Hard Disc Drive 1TB, Operating system windows 8 and HP Laser Jet Printer, Computer Interfacing Cables and Software etc.
11. The system should be supplied with 500 bacterial Viral Filters and 5000 disposable Cardboard Mouthpieces as part of the std, accessories.
12. Warranty for five years and later on CMC should be for five years.
13. Training will be provided to minimum two technicians and two doctors of pulmonary medicine department.

3. Portable system for Standardized six Minute Walk Test

1. The system should be light weight, stand alone with built in Display
2. It should be able to perform real-time testing of Standardized Six Minute Walk Test with measurement of VE, Rf, HR and SpO2 during walking.
3. It should also be able to perform screening spirometry test including FVC (Pre-post), MVV, SVC, Respiratory pattern, Broncho-challenge test as per ATS/ERS standards.
4. It should have internal memory of at least 300 tests.
5. It should allow manual entry of pre-test and post-test parameters (Dyspnea & fatigue measured on Borg scale, blood pressure, distance walked, etc.)
6. It should have facility to download tests to the computer and also to perform real time spirometry testing on a computer directly, APC desktop/note book of latest configuration may be quoted optionally.
7. BTPS Correction: Automatic by means of in-built Temperature Sensor.
8. Power Supply: Should be able to operate from mains and rechargeable batteries.
9. Flow meter: Should be digital Bi-directional Turbine with a flow range of 0.08 to 16L/s, volume range 12L, Accuracy FV:+3%

10. Interface: It should have USB interface for connection to a PC.
11. Software: Software compatible for Windows Vista/7 (32bit) should be supplied with the equipment.
12. Essential accessories / consumables : In addition to the standard set of accessories the system should be supplied with :a) Disposable mouthpieces -1000pcs., b) Nose clips -20pcs., c)3 litre calibration syringe. D) Silicon Face Mask Adult large and small 01no each.
13. Training will be provided to minimum two technicians and two doctors of pulmonary medicine department.
14. Warranty should be for 5 years and CMC for next 5 years.
15. It should be US – FDA approved or European CE approved.

4. **Forced expiratory NO system**

1. Breath nitric oxide test system is intended to measure fractional exhaled nitric oxide (FeNo).
2. Able to measure exhales NO in range 5-300 ppb (parts per billion).
3. Should have electrochemical sensor principle to detect NO.
4. Long sensor life upto 2 years sensor life should be time dependent and not on number of tests.
5. Should have sensitivity and reproducibility of 5ppb.
6. Should be able to use for adults and pediatrics. Breath test time should be around: Adult 12 seconds/ Child 10 seconds.
7. It should be portable battery operated instrument with weight approx 400g including batteries.
8. Able to measure Exhaled No without use of expensive No free air generator.
9. Touch screen operation with built in colour Graphical display.
10. The life of the machine should not be test dependent.
11. It should come with the trainer kit for the patient to practice their technique before taking a test to get the optimum result.
12. It should come with eye level flow indicator to make the patients keeping a constant flow during the exhalation easy for even young children.
13. Should have USB connectivity for computer attachment.
14. The unit should be supplied along with a Laptop of standard make (HP/Del/Compaq/Lenovo/Sony)- with i7 processor, 8GB RAM, at least 15" TFT Screen, USB ports, CD R/W, HardDisc Drive 1 TB, Operating system windows 10 and HP Laser Jet Printer, Computer interfacing cables and software etc.

Nasal High Flow humidifier System

1. The system should have an inbuilt heated humidifier with advanced algorithms for delivery of optimal humidity.
2. It should have inspiratory tubing with inbuilt spiral heater wire for superior condensate control in varying environments.
3. The tubing should be light weight and flexible and be able to deliver flows from 2 to 25 liters (for pediatrics) & 10 to 60 liters (for adults)
4. It should have auto-fill humidification chamber with a dual float mechanism System.
5. The System should have inbuilt Fio2 monitoring device to deliver the Fio2 from 21% to 100%
6. The System should be able to deliver Flow from 2-25 liters (for pediatrics) & 10-60 liters (for Adults)
7. The System should have High & Low alarms for Oxygen
8. The system should have nasal cannula available in different sizes.
9. The system should have inbuilt disinfection mode to disinfection the internal blower of the machine to prevent cross infection.
10. It should have integrated motor/turbine to deliver air flows from 2-60 liters.
11. Suitable for use in NICU, PICU, ICU, RICU, HDU, Post off and wards
12. All items should comply with the international safety regulation and certification-US FDA.
13. Each system will come with 5 sets of tubings and nasal cannula.
14. Warranty for five years and CMC for next five years.

3: Interactive computing board with podium for seminar room

- Single socket solution to minimize the solution downtime.
- Click pattern based user interface.
- LED based with Full HD resolution and 178degrees viewing angle
- Solution should allow manipulating any data format (Web, Text, Animation, Video)
- 1n-built Storage up to 1.0 TB with crash proof file system
- Long 100000 hours usage life.
- It should support ECC-Registered RAM up to 8 GB.
- Hybrid touch technology for heat prevention measure while using touch screen.

- Solution is Virus immune at the tile-system level for keeping the performance same for longer duration (Solutionlife cycle up to 5 years).
- Interactive Computing Digital Board connects software to align with Podium and provide dual interactivity.
- Solution is based on wireless connectivity for lower downtime.
- Does not require projector.
- Feather touch solution for ease in doing any interactive exercise.
- System is allowed to connect any peripheral in Operation Theater room for real time teaching.
- Solution allows Doctors to explain running video either on interactive board or podium.
- Replacement guaranty along with remote assistance.
- Soft Dot stylus and compatible with human finger too.
- Write on video, Cutting from running video, Canvas writing pad.
- PPT, Spreadsheet, Word processor.

Power parameter

- Input power: 110 V 240V AC 50/60HZ
- Standby power consumption: 5 Watt

Work environment

- Operating temperature: 0^{O} -40^{0}C
- Operating Humidity: 10% - 95%
- Product size (mm: 1334.6°-805.4°-139.8
- Gross Weight (kg): 50.2 kg
- IP Rating: 1P57

A/V Parameter

- Audio: 10 watt x 2 Surround sound
- Video: 1080P resolution
- Aspect Ratio: 16:9
- Format: All open and MP3&4

Display Type	LED
Display Panel Diagonal Size	1651 mm
Width of The Effective Display Area ofThe Panel	1524 mm
Height Of The Effective Display Area Of The Panel	965 mm
Backlight Technology	LED
Display Resolution	1080 Pixels
Display Brightness	1500 Nits
Display Aspect Ratio	16:09
Touch interface	Touch sensitive
Touch Technology	Infrared optical
Number of Touch Points	4 Nos.
Response Time	3 milli seconds
Operating System Compatibility	Windows, Linux, MAC, Android
Number or Input HDMI Ports	3 Nos.
Number or USB 2.0 Ports	2 Nos.
Number Of USB 3.0 Ports	2 Nos.
Number Of Audio Input Ports	2 Nos.

Number Of Audio Output Ports	1 Nos.
Number Of RS-232 C Ports	0 Nos.
, Number Of RJ 45 Ports	1 Nos.
Number Of VGA-IN Ports	I Nos.
Number Of VGA-OUT Ports	I Nos.
Provision Of In Built Speakers	Yes, 20 watt
Provision For Wall Mounting	Yes
Bluetooth Connectivity	Yes
WI-FI Connectivity .	Yes
CPU, RAM, HDD, Cache,	Intel-i5, 8G13, 1.0 Tera-Byte, L3 cache.
Keyboard Mouse	Wireless

SPECIFICATION: DIGITAL PODIUM

- MS. Steel with polymer powder coated / Composite Materials,
- Document Tray,
- Electrical Actuator to adjust the monitor's ergonomic angle as per user comfort
- Lockable sliding Tray for Key Board
- External Device - Power, USB, AUDIO, VGA, HDMI, LAN to he placed with Tray
- 4 Caster wheels with lock for easy movement
- Screen Size 21.5 inch
- Resolution 1920x1080
- Contrast Ratio 5000:1
- Brightness 250ed/m2
- Response time 16ms
- Operating System: Windows, Linux, MAC.
- Touch Technology: Hybrid touch
- Power: 3 pin power socket
- CPU: Intel-I5
- RAM: 4 GB
- HDD: 500 GB

4: Computer Assistant Learning module for teaching UG (1st MBBS) and PG (MD)

For teaching Physiology in UG curriculum, the required knowledge and skills should be imparted by using 'Computer Assisted modules'

Computer Assisted Modules

- **Experimental Physiology**
  - Instruments
  - Dissection to obtain Nerve muscle preparation
  - Reactivity of Tissues + Simple Muscle Twitch + Effect of temperature on muscle contraction
  - Effect of Increasing strength of stimulus + Effect of two stimuli on muscle twitch
  - Genesis of Tetanus + Genesis of Fatigue
  - Effect of Load on Muscle Contraction + Isometric Contraction
  - Conduction Velocity of Nerves
  - Normal Cardiogram of Frog + Effect of Temperature on Frog's heart
  - Effects of Stannius Ligatures on frog's Heart
  - Properties of the heart muscle
  - Effect of Vagosympathetic Stimulation on Frog's heart
  - Effect of Nicotine and atropine on Frog's heart
  - Effect of Ion's on Perfused Frog's heart

- **Experimental Physiology (Software for Testing of Effect of Drug - In Vivo)**
    - Effect of Drugs on Blood Pressure- Dog Blood Pressure
    - Potentiation – Effect of Acetylcholine + Neostigmine on Dog BP
    - Tachyphylaxis – Effect of Tyramine on Dog BP
    - Nicotinic Action of Acetylcholine on Dog BP
    - Dales Vasomotor reversal – Effect of Adrenaline and Noradrenaline on Dog BP
    - Effect of Miotics and Mydriatics on Rabbit Eye
- **System Requirements**
    - Internet Requirement (Lan Connection required)
    - Processor – Any Processor (i3 or more recommended)
    - RAM – 4GB and above is recommended
    - Windows XP Onwards (Recommended Windows 7, 8, 10)
    - Player - VLC (Preferred) / Windows Media Player / Quicktime

Group-I: Radiology

1: Flat Panel Detector

Specifications of Flat Panel Detector (Retrofit DR System) for Radiography

Quantity- 03 (Three) sets, each set comprises of Chest stand and table Bucky unit (total 6 detectors).

Offered detector must be compatible with all make and model of diagnostic x-ray machine. Flat Panel Detector (FPD) system for General Radiography System should be capable of taking the complete range of radiographic examinations with the following Specifications & Configuration.

A. Flat Panel Detector :

1. Latest 14"x17" Flat Panel cassette sized detector, ISO 4090 compliant fits in an existing wall-stand or table bucky tray without modification.
2. The Scintillator material of the detectors should be made up of Cesium Iodide and sensor with Thin Film Transistor (TFT) and Amorphous Silicon technology
3. The detectors should be water resistance with minimum IPX6 standard. Test certificates should be provided along with technical documents.
4. Detector must has passed drop test at minimum height of 120 cm.
5. The detectors offered should have on board memory capable of storing minimum 50 images.
6. The detectors should have minimum DQE of 55% @ 1 lp/mm or more.
7. The detectors should have a minimum spatial resolution of 3.3 lp /mm or more
8. Detector array Size: Should be a minimum of 2.5K x 3K pixels or higher
9. Pixel Pitch: 150 microns or less.
10. A to D conversion: 16 bits.
11. Images pre-viewing should be available in about less than 3 secs after exposure and the cycle Time should be less than 12 seconds.
12. Battery: inbuilt Lithium ion battery will be preferred. If it is external chargeable battery then it must be of latest Lithium Ion type. 2 Nos of Batteries for each Panel along with battery charger should be provided. Company should replace batteries free of cost within the warranty period and CAMC. The battery offered should be replaced irrespective of charge cycle limitations. In case of inbuilt Battery, detector manufacturer should either replace battery or detector in case of any breakdown of battery. Kindly specify the battery type and life of offered model.
13. Detectors offered should be capable of handling 150 or more exposures or 5 hours of operation in single full charge.
14. The detectors should have Automatic Exposure Detection as standard feature
15. The detectors should be able to work at normal room temperature and humidity. The detector system should not require frequent calibrations on daily start-up.
16. Detector weigh bearing capacity should be minimum 300 kgs.
17. In case bidder is not the manufacturer/Subsidiary then they must offer warranty certificate in original issued by original manufacturers for FPD`s. The original manufacturer must also give an Undertaking the guarantee to support during the entire life of the detector
18. The offered detectors should be CE & USFDA Approved

B. Image Processing Console cum workstation:

1. Original acquisition workstation software of Flat Panel Detector must be from parent company. The DR Console should be offered with latest high end image processing capability console software and high speed processor with Medical Grade monitor of 19" or more.
2. The Console or Acquisition Workstation PC to be supplied should be of latest generation with at least 8GB RAM, Intel i9 / i7 Processor and 1 TB hard disc memory.
3. There should be facility for measurements.
4. Selection of Patient demography.
5. Selection of the Anatomical parts to be X-rayed.
6. Windows and Level Adjustments.
7. Annotations must be possible.
8. Previews of images should be available in about 3 Sec or less.
9. Zooming, ROI, Image Cropping and Masking, automatic grid removal function.
10. Soft tissue processing must be possible.
11. Should offer capability of local image storage.
12. Should be capable of connecting minimum of 2 Flat panels simultaneously.
13. Should be capable of connecting directly to the Dry Laser printer of any make & model.
14. Should have capability to push images to location(s) of choice such as: workstation, PACS, External storage devices, DICOM printers.

C. Accessories – To be offered as standard:

1. The system should be supplied with suitable online UPS with 20-30 minutes battery back-up.

D. OTHER REQUIREMENTS:

1. Detector and Console Software should mandatorily be from the same manufacturer.
2. Easy availability of spares in India.
3. Trained engineers to maintain and support the system.
4. All specifications to be provided with original product data sheet/catalogue.

Offered system should have 3 years warranty from date of installation and 7 years CAMC to be quoted separately thereafter. Warranty and CAMC must include whole system including detector, console, software, UPS and battery.

2: 256 Slice CT Scan

Technical Specification

The system quoted should be latest state of art top of the line. The system should have 128 or more physical rows of detectors capable of Dual Energy applications. The scanner should be capable of comprehensive whole body imaging including cardiac, abdomen, neuro and vascular imaging applications, true isotropic volume acquisition. It should also be capable of 3-D reconstructions at fast speeds, quantitative calcium scoring in the vessels using all documented quantification algorithms, 3- D image display during acquisition on-line as well as real time, 3-D vessel imaging with feasibility for volume rendering.

The AERB compliance for the equipment and its installation would be the responsibility of the supplier.

The offer should meet the specifications as followed:

1. Gantry:

a. The CT Scanner should have low Voltage Slip Rings incorporated in the Gantry

b. The Minimum scan time for a 360 Degree rotation should be less than or equal to 0.28 seconds or better

c. The gantry should be provided with User control panels on either side for easy positioning.

d. The sub millimetre Slice @ 0.63 mm or less in 128 physical rows / 64+64 as sandwich arrangement of detector and should be able to acquire 256 slices per rotation. The system should be in position to perform 256 acquisition Slices per Rotation for general, cardiac/vascular applications. Vendor should specify the Z-axis total detector width.

e. The Gantry should have 3D Positioning Laser lights.

f. The Scan field of view (FOV) in acquisition mode should be at least from 250 mm to 500 mm with intermediate Steps for scanning different anatomies.

g. Gantry aperture diameter should be 70 cm or more.

2. X ray Section: (Generator & X-Ray Tube)

a. The X ray Generator should be compact and inbuilt in the Gantry.

b. The generator output power should be 100 kW (actual power) and above.

c. The mA range available should be between 20 to 740 mA or more with increments in steps of not more than 10mA.

d. The X ray Tube should be essentially Dual Focus. The heat storage capacity should be at least 5.5 MHU or equivalent. Specify the method and technique of cooling.

Any special feature of the X ray tube to be highlighted with literature.

e. Specify the focal Spots of the X ray tube.

f. The X ray tube should have a cooling rate of not less than 1000 KHU per MIN

g. The X ray tube Cooler Unit should be in built in the Gantry.

3. Detectors:

a. The Detector Offered should be Solid State. Specify the Material.

b. The 256 acquisition slice or more per Rotation should be possible. The Systems should have at least 128 Physical Rows of the detector or more.

c. Specify the Fan Angle of the X rays and the geometry. The detectors should not require frequent calibration.

4. Patient Couch:

a. The patient table offered should have a minimum load bearing capacity of at least 200 KG.

b. The Minimum table top height should not be more than 65cms from the floor level for easy transport of trauma patients.

c.The Floating table top width should be at least 40 cms for better comfort.

d. The range of metal free scan should be at least 200 cms.

e. The vertical range should be at least 55 cms (max height - min height)

f. Specify the reproducing accuracy of the table.

g. Remote UP/DOWN, FWD/BWD of the Patient Couch should be standard.

5. Topogram:

a. Views: should be feasible in frontal and lateral views

b. Should be possible to interrupt acquisition manually if necessary.

6. Spiral/Helical Section:

a. The system offered should have Spiral Capability of at least 80 seconds & above. Real Time Spiral @ 10 f/s should be standard.

b. The range of Spiral facility in Axial Direction should be 100 cms or more.

c. The Reconstruction Time in Spiral scan should not be more than 100 millisecond.

d. The system should have the Smart Prep or equivalent facility & ability to track Contrast medium to trigger scan should be included in the scope of Supply

e. High Resolution scan package should be offered as standard and Specify the minimum slice thickness for which High Resolution scan package is possible.

f. Multi Slice CT Fluoroscopy to be quoted as standard. Price should be quoted separately. (Optional)

7. Console & Workstation

a. The Console offered should be the Latest Multi tasking Processors and a menu driven platform with a RAM size of at least 8 GB.

b. CT console should be of dual monitor design. The Monitor should be: Medical grade, Colour TFT/LCD, The Twin Monitor system should work on either shared or Common data base.

c. The display matrix should be at least 1024 x 1024.

d. The reconstruction time for an Axial scan should not be more than 100 milli seconds.

e. The Hard disk Capacity for both Image and Raw data should be more than 500 GB

f. It should have facility to store at least 2,50,000 Images

g. The system should be supported with archiving facility of DVD & CD in Main Console

h. DICOM facility to send, store, print, receive, Query / Retrieve, MWM, MPPS etc should be standard.

i. Patient radiation dose should be displayed on the monitor as well as on the patient films.

j. PC Based connectivity should be standard for easy transfer of Images & Report. The image transfer from main console to workstation should be automatic and immediate.

k. Workstations & Server. A multimodality client server architecture based solution with minimum concurrent 24000 slices rendering capacity, with 64GB RAM with storage of minimum 2TB and Additional online storage of 10 TB on the server. Client hardware specification- 3 numbers of duel monitor type Workstation with life time two licenses: dual quad core processor, 16 GB RAM, 1TB hard drive, DVD Writing with medical grade monitor of minimum 2 MP resolution & 3 button mouse.

The server client solution offered should be from OEM

MPR

Minimum and maximum intensity projection (MIP).

3D volume rendering.

3D SSD (Shaded Surface Display).

Advanced vessel analysis.

Auto bone removal.

Virtual endoscopy.

Dedicated colonoscopy.

Time point comparison.

l. Whole organ (brain & body) perfusion CT.

m. Coronary tree analysis: automated 3D processing of coronary arteries, calcium scoring, stent analysis, LV analysis.

n. Neuro DSA with automated bone removal.

o. Fusion CT: fusion of morphological data of CT & MRI.

Dual Energy Applications:

i. DUAL ENERGY APPLICATIONS to be provided as standard: Mention the technology for dual energy acquisition: Duel source Duel detector technology/ Gemstone detector with ultras fast kVp switching technology/ duel layer sandwiched detector technology or other method.

Minimum 2 nos of concurrent users license required for all applications.

Renal Calculi Characterization.

Automated Spectral Gout imaging protocol.

Cardiac imaging including myocardial perfusion.

Lung perfusion & pulmonary emboli detection.

Advanced lung analysis which includes automatic segmentation of lung, lung volume, mean lung density, slandered deviation calculation of emphysema index, sub-ranges percentiles and clusters. Iodine based spectral lung perfusion to quantify pulmonary artery embolism.

Spectral pulmonary perfusion- one click protocol

Vascular plaque clisracterization.

Virtual NCCT imaging.
Direct Neuro CTA.
Contrast vs blood differentiation.
Monoenergetic imaging.
Tissue differentiation (tendon, ligament).
Endo leak assessment.
Marrow imaging by calcium substraction to look for marrow pathology.
ii. Dual energy application must be possible on all workstation and all fields of view with minimum FOV 33cm.
iii. DUAL ENERGY APPLICATIONS like Metal Artifact Correction/Beam Hardening artifact Correction, Brain Haemorrhage should be available in the system.

Application:
a. The system should have standard software like 3D Volume rendering, MIP,CT angio, color angio Display, CT Perfusion, should be available as standard on the system
b. The following soft ware should be offered as standard (MPR, ROI, VOLUME CALCULATION, CT NUMBER DISPLAY, WINDOW WIDTH, WINDOW LEVEL TOPOGRAM DISPLAY, CINE DISPLAY, HRCT LUNG, DYNAMIC SCAN)
c. Cardiac Scan Attachment with ECG Gated Segmented Recon, Calcium score, Vessel Flythrough of the Coronaries should be available with software package. Coronary artery segmentation, Qualitative and quantitative Myocardial perfusion
d.Automatic display of MPR Images after scan should be present.
e. Bolus triggered Brain Perfusion CT study (at least 3-level) with automatic CBF, CBV, MTT, TTP maps, ROI placing, comparing ROI, saving maps
f. Neuro DSA with automatic bone removal software
g. Fusion CT: fusion of morphological data obtained on CT, MR or DSA.
h. Complete automated liver segmentation and semi automated segmentation of arterial, portal and venous vascular and bile duct tree. Liver volumetric application.
Liver fat quantification-evaluate hepatic steatosis with liver fat percentage measurements compatible with non contrast and multiple phase contrast acquisition.
i. Multi time point compare with WHO & RECIST should be offered as standard.

8. Dose reduction Techniques:
A. Noise Suppression protocols to maintain LCR at low dose should be standard.
B. Special Softwares (Like mA Modulation in Routine & Cardiac Mode) to ensure Dose efficiency should be standard.
C. Specify the CT Dose Index.
D. Should have model based iterative reconstruction technique (VEO/ADMIRE/IMR) for X Ray dose reduction. If VEO is not available, vendor should submit an undertaking from OEM.
E. Low dose Pediatric CT mode should be available
F. Radiation dose reduction technique i.e. mA modulation in X, Y & Z axis, etc.
G. It should have iterative image reconstruction capabilities.
H. Patient radiation dose should be displayed on the monitor & patient films.

9. Accessories: (Make and Model of all the quoted accessories should be specified)
a) Dry chemistry camera of DPI 500 or more of any reputed make with three tray.
b) Lead Glass as per AERB norms: 200 x 100 cm aptispal-Qurglo-price.
c) UPS with Maintenance free batteries capable of 30 minutes back up to run the entire CT, Computers, Dry chemistry camera, Work Stations etc.
d) Dual Head Pressure Injector of reputed make with 100 nos of Syringes & 400 sets of tubings. Specify the make of Injector. Quote the Price of syringes and price contract must be offered for first three yrs from supplier.
e) Multi Para monitor 10 inch monitor, ECG, SPO2, NIBP module of a reputed make for monitoring vitals.
g) LIGHT WEIGHT lead aprons (0.25mm Lead equivalent) with hangers - 4 Nos.
h) Lead apron stand - 2 No.
i) Thyroid Shields - 2 nos.
j) Gonadal Shields - 2 nos.
k) ECG lid-100 nos
l) Color Leaser jet printer for the printing of CT images-01

10. On Site Training for a period of 10 Weeks in different phases / as per requirement during warranty period.

11. Certifications:

i. Should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for Medical Devices and copy of valid license should be submitted for the quoted model.
In case the vendor has not yet obtained import/manufacturing license from CDSCO for the quoted model, proof of application for CDSCO medical device license to be submitted in the bid document and valid CDSCO license to be produced at the time of supply/ NOA for the quoted model.
ii. The system should be AERB type approved and the copy of E-LORA Listing should be submitted along with bid.
iii. Regular QA testing according to AERB norms will be responsibility of bidder during warranty and CAMC period.
iv. Machine should be FDA approved.
v. Decommissioning from AERB site of existing CT machine will be done by vendor.
vi. Floor planning and registration of new machine on AERB site will be done by vendor with the help of institute RSO

12. The Scope of Work-Site Modification Work - CT
Price may be quoted separately
1. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, air-conditioning and Fire fighting for the construction of CT Scan Centre.
2. While preparing the plan, the following aspects have to be addressed.
a. Radiation shielding for doors, walls, windows etc.
b. Furniture like desk, chairs, shelves etc.
3. The cost of Site Modification for the area of 1000 sq.ft and Air-conditioning of appropriate Tonnage will be considered for Ranking / Evaluation purpose. Total capacity of the Air-Conditioning for the entire CT scan centre area should be mentioned (incl. standby airconditioning) with humidity control between 55-60 % RH.
Optional. Price should be quoted separately
4. Moreover Bidders will have to quote the Unit Rates of the following components of site modification work
a. Civil works
b. Electrical work
c. Air Conditioning (HVAC)
d) Interior Furnishing & Furniture
e) Miscellaneous

The CT SCAN CENTRE shall consist of the following rooms:
a. CT Gantry Room
b. Console room
c. Equipment room,
d. CT reporting room

Civil work
a) Cable tray, trench & channel - necessary trenches, cable tray and channels at required location would be provided.

a) Flooring
1. 600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room
2. Vinyl flooring in CT equipment/UPS room.
b) Painting
c) False Ceiling
1. Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.

Electrical work
1. The supplier shall be required to specify the total load requirements for the CT scan centre including the load of air conditioning, room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the CT Scan centre area. The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.

2. The electrical work shall include the following:
a. Wiring-All Interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
b. Switches light and power points should be of modular type and of standard make as listed below.
c. General lights LED light fittings with 500 Lux Illumination

Miscellaneous:

1. LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14"x17" size. - 3 no.s
2. Broadband connection: for REMOTE SERVICE of CT system.

LIST OF ITEMS AND SUGGESTED MANUFACTURERS.

ITEMS	PREFERRED MAKES
1. CABLES	Finolex, Havells,V-Guard
2. SWITCHES	Legrand, L&T, Crabtree, Roma
3. DISTRIBUTION BOX, MC	Legrand, L&T, Siemens, Havels
4. LIGHT FITTINGS	Philips/Crompton/Wipro/syska

Sl. No.	BILL OF QUANTITY	Qty	UOM
1.	CT Scanner 256 SLICE CT, as specified	**1**	**No.**
2.	Servers: as specified	**1**	**No.**
3.	Workstation Nodes: as specified	**3**	**No.**
4.	Dry Chemistry camera: as specified	**1**	**No.**
5.	Lead Glass of 200 x 100 cm	**1**	**No.**
6.	UPS with Maintenance free batteries	**1**	**Set**
7.	Dual Head Pressure Injector	**1**	**No.**
8.	Pressure Injector Syringes	**50**	**Nos.**
9.	Tubings for Pressure Injector	**200**	**Sets**
10.	Multi Para monitor; as specified	**1**	**No**
11.	ULTRA LIGHT WEIGHT lead aprons	**2**	**No**
12.	Lead Apron Hanger	**6**	**No**
13.	Lead apron stand	**2**	**No**
14.	Thyroid Shields	**2**	**No**
15.	Gonadal Shields	**2**	**No**
16.	Color Leaser jet Printer	**1**	**No**
17.	ECG Led	**100**	
	Others any items		
	Components of Site Modification Work		
1.	Civil works	**1000**	ft^2
2.	Electrical work	**1000**	ft^2
3.	Interior Furnishing & Furniture	**1000**	ft^2
4.	Miscellaneous items	**1**	**Set**
	Miscellaneous:		
	LED X-ray Film viewer	**3**	**no**
	Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc	**1**	**LS**
	Buyback of existing 128 slice CT scanner (Make; Toshiba, Model; Aquilion): Price must be quoted separately. Following items are included in the buyback: 1. CT scan machine along with table and console. 2. Pressure injector-01 no 3. UPS with batteries 4. Anesthesia work station 5. Color printer-01 6. Fluoroscopy unit 7. Stabilizer 8. Any other item		

On site warranty of 05 years and further 5 yrs CAMC to include CT machine with all supplied accessories, CT tube, UPS batteries, all civil, electrical and AC work including periodic maintenance.

Group-J: RIO

1: RATCAM with LIO

A: RETCAM

Description of Function: Used for immediate assessment of retina and anterior chamber.
Product Quality Standard: Should be CE/USFDA/BIS approved model.
Technical Specifications:
Should be supplied with interchangeable lens or at least 120° FOV.
Should allow recording of the visual.
Should be able to mark, locate and capture desire area of the image.
Still photos should be able to capture during video recording.
Computer system should be of latest processor, 500GB hard disk, 4GB RA 19inch monitor and recording in CD/DVD facility.
Should preferably have up gradation facility to angiography.

B: GREEN LASER (LIO)

LASER TYPE: Diode pumped, frequency doubled, true cw & solid state (Medical Grade), 532nm.
THERAPY LASER POWER Between1.3-1.5 W at the cornea
PULSE DURATION: 10-2500 ms (CW) (Single Pulse)
COOLING: thermoelectric/air cooled
Pilot/ Aiming Laser: 635-650 nm Red diode laser
LIO: It should be Light weight and portable.

ACCESSORY
High quality Laser treatment contact lenses (standard focal/Grid, PRP 165)
High quality 20 Dioptre Lens for LIO - 2
Laser Link FIBRE OPTIC Cable-2
Foot switch
Elbow rest
Laser safety eye glasses-3

Note: Subunits A & B can be bided separately.

Group-K: Urology

1: O.T. & Other Instruments

Technical Specifications for Multi Features Electro-Cautery with Monopolar/Bipolar, Thermo-fusion

Specifications:

Microprocessor based300watt energy device with monopolar; bipolar thermo-fusion &divider with expanded electrosurgical features.

- Real time tissue impedance monitoring technology to deliver the selected power perfectly into a wide range of tissue types reducing thermal spread, RF interference and Neuro muscular stimulation andsparks.
- Should have Smart Tissue Sensing Technology which monitors changes in tissue impedance >400000 times per second and adjusts energy output accordingly
- RF should be above 400 KHZ
- Should be compatable with Ultrasonic Energy.
- Total device with operating hand-instruments should be European CE (notified body) & USFDA approved.
- Return Electrode Contact Quality MonitoringSystem.
- Facilitating two surgeons simultaneously during asurgery.
- Should have touch screen with enhanced easeuse.
- Should have quick settings according to surgeonpreferences.
- Easy to understand erroralerts.
- Should have Smart connector feature to plug &operate.
- Minimize lateral thermal spread to surrounding tissue.
- System should come with Disposable hand instruments/Accessories.
- System should have an option of up-gradations through USBdevice.
- Power should be adjusted from the sterile field by the surgeon from the monopolar pencil.
- Instruments should have option of hand and foot control with sealing & dissection in both 10mm & 5mm laparoscopic and openhandsets
- Indicator for Re-Grasp should be activated asnecessary.
- Seal Cycle should be with Auto Stop Features & fast sealing time of 2 to 4seconds.
- Machine should give indicative beep sound to signify that sealing has beencompleted.
- Should be compatible& upgradable to with argon plasma /CUSAmodule.
- System should be able to Seal tissue bundle up to 7 mm.
- Tissue Fusion system should be able to seal artery, veins along with tissue bundle up to 7mm, and fused tissues withstands up to 3 times systolic bloodpressure.
- The System should incorporate tissue feedback technology with simple controlpanel.

Defibrillator Proof: This generator complies with the ANSI/AAMI HF18 specifications for "defibrillator proof" designation and IEC 60601-2-2.

Electromagnetic Interference: When placed on or beneath an activated electrosurgical generator, this generator should operate without interference. The generator should minimize electromagnetic interference to video equipment used in the operating room.

OUTPUT CHARACTERISTICS

- BipolarModes:-
  Precise /soft
  Standard /medium
  Macro /high/forced
- Monopolar cutmodes:-
  Pure/Auto modes.
  Blend/dry cut modes.
  High cut modes.
- Monopolar Coag modes :-
  Desiccate
  Fulgurate : frequency of 30 or 57 khz into 500 ohms.
  Spray coag
- **Thermofusion**
  Vessel Sealing with divider up-to 7mm diameter i.e FDA approved

The accessories should be from the OEM only.

Should have FDA approved hand instruments & accessories

- ElectroSurgeryPencils(with power control slider) - 20 nos
- Adult Patient Pad -50 nos
- Pediatric Patient Pad -50 nos

Reusable Bipolar forceps-

- Bayonet (Blunt tip1mm-0.7 mm) - 1nos.
- Straight (Blunt tip1mm-0.7mm) - 1nos.
- Bipolar Cable -50 nos

- Open Hand instrument for Advanced Tissue fusion equipment with curved jaw with Seal length of approximately 16-17mm, with cutting facility for a cut length approx14-15mm, and total length of hand instrument is18-20cm -3pc
- Open Hand instrument for Advanced Tissue fusion equipment with curved jaw with Seal length of 36mm and cut length of 34mm -3 pc
- Open 5mm Maryland type Hand instrument for Advanced Tissue fusion equipment with seal length of 20mm, with cutting facility for a cut length of 18mm, having jaw apertureofapprox13-14mm -3pc
- Laparoscopic 5mm Maryland type Hand instrument for Advanced Tissue fusion equipment with seal length of 20mm, with cutting facility for a cut length of 18mm, having jaw apertureofapprox13-14mm -3pc.
- Laparoscopic Flat L-Hook Electrode, , PTFE Coated 36 cm, coated - 6pc
- Laparoscopic Curved Spatula Electrode, PTFE Coated 36 cm, coated - 6pc
- Laparoscopic 5mm Maryland type Hand instrument for Advanced Tissue fusion equipment 37 cm with integrated Retractable L-Hook Laparoscopic Device -3 pc

2: ESWL Machine

Integrated Extracorporeal Shock Wave Lithotripter (ESWL)
For treatment of urinary stones and GI stones in adult and children

The system should provide Anaesthesia free treatment and should have integrated X-ray and ultrasound localization facilities. The system should comprise the following:

- Shock Wave Source
- Stone localization system
- ECG Monitor
- Patient Information management system
- Treatment table and accessories
- Hand Control Unit
- Separate Remote Console

Shock Wave Source:

1. Should be latest generation, state of the art model, with **Electro Magnetic Shock Wave Emitter**technology.
2. Membrane based dry coupling.
3. The Shock head should have a penetration depth of 170mm or more.
4. Shock wave head should have facility for variable energy level for facilitating low energy treatments for pediatric patients and high energy treatments for hard stones.
5. Shock wave head should have a flexible motorized therapy head to enable under and over table treatments for all the treatments in comfortable supine position and should have facility of seamless multiple therapy window angles.
6. Shock wave head and C-Arm fluoroscopy should be mounted such that both should have same axis of rotation.
7. Should have variable levels of energy at least in 11 steps.
8. Adjustable step-wise frequency shock release should be minimum 30 or less and maximum 100or more shocks per minute, in increment of 10, with facility of ECG triggering.
9. Should have dynamic pressure coupling facility which will automatically adjust to the patient body contour even on slightest patient movements during the treatment.
10. Unified hand control should control all the parameters of shock wave, movement of Shock wave source, C-Arm and Table. The display of Unified hand control should also indicate thecoupling pressure for shockwave release
11. Unified hand control should have image oriented movement mode for X ray guided ESWL to enable precise movement of target to the focus with pictorial guidance
12. Movement of Shock wave source should be motorized, in all the required axes (viz. X and Y) to enable precise movement of the focus to the target. The under the table and over the table positions of the Shock wave source should also be motorized.
13. Should have imaging technology to view the patient contact interface from within the therapy head.

Stone Localization System: Integrated, isocentric fluoroscopy and ultrasonography:

1. Localization and treatment using simultaneous dual imaging (ultrasound as well as X ray Fluoroscopy) should be possible.
2. Both the imaging systems should be iso-centric to the Focus.

Integrated X-Ray:

1. Should have integrated, iso-centric and motorized X-ray C-arm localization and targeting system.
2. 15 kw or more X-ray capability to allow all endo- urological interventionsand ERCP
3. High frequency X-Ray generator, double focus X-Ray tube and flat panel detector
4. X-Ray C-Arm should move iso-centric to the shock wave source in both lateral directions to achieve two positions to localize the stone in three dimensions.
5. AP "0" degree and both CC directions i.e. CC+ and CC- 30 degree
6. At least two medical grade, minimum 17-inch monochrome monitor should be supplied
7. All movements of the C-arm should be motorized and controlled through the unified hand control
8. C-arm should be part of ESWL module and should be inseparable from the ESWL machine. A external C-Arm, from third party, integration should not be allowed.

Ultrasound System:

1. A color ultrasound should be supplied.
2. Should have a 15" or bigger flat panel monitor
3. Should have 1 -7.0 MHz multi-frequency transducer for lithotripsy with urological software package.
4. Localization should be done through integrated and articulating ultrasound arm iso-centric to the shock wave source with outline transducer for best image quality.

ECG Triggering:

1. Should supply a compatible ECG monitor for monitoring as well astriggering of shock wave release.

Patient Information Management System

1. Workstation
2. Live X-Ray Image Acquisition/Processing
3. Features: Last image Hold, window and level control, Horizontal reverse, vertical reverse, Grey level invert
4. Image Format/Storage
5. Export Function
6. System Backup: CD-R/DVD-R, Patient data / image archive, CD-R or DVD-R / -RW
7. Print Functions

DICOM 3.0 Services

- Media Interchange.
- Work list Management.
- Storage System
- Basic Print

Advanced Patient Data Management

Features: User defined templates for diagnosis and therapy, indication of calculi on image for easy documentation, patient history record and acquisition of therapy data, data analysis and statistics.

Treatment table & accessories:

1. Ergonomically designed patient table usable for both for ESWL and endourological procedures by allowing full patient access.
2. Should have a 3-Way motorized treatment table from the same manufacturer with extensions and basic accessories for patient positioning and comfort.
3. Table should be integrated with system
4. Table movements should be possible with the same hand control unit which is for shock wave release
5. Design should accommodate the C-arm movement on both CC (+ 30 degree and -30 degree) directions.
6. In case of an emergency, the same table should be used for transportation of patient.

Hand Held Control Panel

1. Should have unified hand control unit to have all the movements of table, C-arm, shockwave parameters and shockwave release from the same.

Remote Console

Separate remote console with facility for ccontrolling imaging, stone localization, targeting, shockwave parameters and patient monitoring

Terms & Conditions:

1. ESWL system should be USFDA / CE approved

2. Should have installation within India of the quoted/similar model, for spot evaluations, if needed.
3. Bidder should facilitate to get the NOC to import the machine and to operate from AERB
4. Suitable indigenous UPS with 30 minutes battery backup for complete load of the ESWL machine as per actual requirement
5. The system should be upgradable and all spare parts should be available for next 10 years after commissioning

3: Endoscopes Upper and Lower Tract for Adults & Paediatrics

A	**Cystoscopy TURP & Urethrrtome set**	
1	Telescope 30 Degree, 4mm, autoclavable	1 no
2	Telescope 0 Degree, 4mm, autoclavable	1 no
3	Telescope 70 Degree, 4mm, autoclavable	1 no
4	Telescope 12.5 degree ,4 mm, autoclavable	1 no
5	Cystoscope Sheath, 17.5fr. -25 Fr	1 no
6	Cystoscope Bridge,with 1 lockable channel	1 no
7	Cystoscope Bridge,with 2 lockable channel	1 no
8	Catheter deflecting mechanism with 2 lockable channels, with quick control	1 no
9	Optical Grasping forceps, 5fr. double action jaws for stent removal	1 no
10	Forceps for removal of foreign bodies of 5Fr,7Fr & 9Fr each with double action jaws, flexible ,length 40 cm	1 no
11	Biopsy Forceps 5Fr, 7F & 9 Fr, each with double action jaws, flexible, length 40cm	1 no
12	Working Element passive cutting action handle closed for Resectoscope sheath	1 no
13	Resectoscope outer Sheath 26fr. With inner sheath 24fr. Including connecting tubing for in and outflow, oblique beak, rotatable inner tube with ceramic insulation	1 no
14	Standard obturator& Visual obturator each with channel for flexible instruments	1 no
15	Cutting Loop Bipolar 24fr	1 no
16	Cutting Loop Bipolar small 24fr	1 no
17	Cutting electrode loop 0,3 mm wire	1 no
18	Collins Knife,	1 no
19	coagulating electrode angled,blunt	1 no
20	Coagulating electrode,angled,pointed.	1 no
21	Coagulating electrode, with barrel-shaped end.	1 no
22	HF Monopolar connecting cable	1 no
23	Bipolar HF cable	1 no
24	UrethrotomeSheath 21 Fr.	1 no
25	Obturator for urethrotome sheath	1 no
26	Telescope Bridege for use with urethrotome sheath with 5 Fr channel for instruments	1 no
27	Supplementary Sheath, side open for introduction of ballon catheter, to slip on urethrotome sheath	1 no
29	Mouermeyer stone punch -Punch-Working Element, Punch Sheath, with Central Valve, including connecting tubes for in- and outflow, 25 Fr., straight beak, with obturator. Insert Tube, with channel for flexible instruments, 7 Fr., with atraumatic beak for urethroscopy	1 no
30	Sachse cold knife,straight	1 no
31	cold knife, round	1 no
32	cold knife,round	1 no
B	**BIPOLAR TURP**	
1	Bipolar active working element	1 no
2	Bipolar passiveworking element	1 no
3	Bipolar HF- Cable	1 no
4	Rotatable outer sheath, 26 Fr. , 2 stopcock	1 no
5	Resection inner sheath, 24 Fr.	1 no
6	Small Loop Electrode	1 no
7	Medium Loop Electrode	1 no
8	Large Loop Electrode	1 no
9	Roller Electrode	1 no
10	Needle Electrode	1 no
11	Button Electrode	1 no
12	Enucleation Electrode	1 no
		1 no
C	**MINI NEPHROSCOPE SET**	

1	Mini Nephroscope 10^0-12°, with angled eyepiece, 11-13 Fr., length 24-28 cm, autoclavable, one working channel 5-7 Fr. fiber optic light transmission incorporated	1 no
2	Single Set Dilator, 13-15fr.	1 no
3	Single Set Dilator, 11-12fr.	1 no
4	Operating Sheath, 14 - 16 Fr., for continuous irrigation and suction	1 no
5	Operating Sheath, 17 -19, Fr., for continuous irrigation and suction	
6	Alligator forceps for removal of foreign bodies of 5fr-6Fr with double action jaws, length 33-36 cm	1 no
7	forceps three-prong for removal of foreign bodies of 5fr-6Fr with double action jaws, length 33-36 cm	1 no
8	Dilato Set r 9-30 fr.	1 no
9	Centre rod 6fr.	1 no
D	**NEPHROSCOPE SET**	
	Nephroscope 18-20fr.	
1	Wide angle straight forward Rigid nephroscope with angled eyepeice , View 10^0-12^0 working channel 3-3.5 mm	1 no
2	continuous flow operating sheath compatible to above nephroscope	1 no
3	Obturator continuous flow operating sheath capability 19-20 Fr	1 no
4	Standard Grasping forcepsfor nephroscope 9-10.5fr. with double action jaws, length 33-36 cm- Biprong , Triprong, alligator and peanut	1 no
5	Biopsy forceps	1 no
6	Endopyelotomy knife	1 no
7	Metal 9-30 fr. Dilators set	1 no
8	Wide angle straight forward Rigid nephroscope with parallel eyepeice	1 no
9	continuous flow operating sheath capability 22 Fr	1 no
10	Obturator for continuous flow operating sheath capability 22 Fr	1 no
11	Standard Grasping forceps- Biprong , Triprong, alligator and peanut	1 no
12	Biopsy forceps	1 no
	Nephroscope 20-24fr.	
13	Wide angle straight forward Rigid nephroscope with parallel eyepeice , Angle of view 16^0-20^0working channel 3-3.5 mm	1 no
14	continuous flow operating sheath compatible to above nephroscope	1 no
15	Obturator for continuous flow operating sheath capability 24 Fr	1 no
16	Standard Grasping forcepsfor nephroscope 9-10.5fr. with double action jaws, length 33-36 cm - Biprong , Triprong, alligator and peanut	1 no
17	Biopsy forceps	1 no
18	Hollow obturator and facial dilator (Preferably Amplatz)	1 no
19	Initial puncture needle - 2 part and 3 part	1 no
20	Storage & transportation tray	1 no
21	Aiken cannula	1 no
22	Amplatz sheath (Full set)	1 no
E	**Specification for URS set 4Fr**	
1	Compact operating fibre uretero-renoscope, autoclavable, 4.5/6.5 fr.angle of view 5 deg.,Including automatic valve for inserting instrument, with oblique eyepiece . Distal tip of sheath 4.5 fr.Oval irrigation and instrument channel of 3 fr.For accessory instruments of max. 4 fr. Working length 430 mm.	1 no
2	Yellow washer (pack of 10)1	1 pac
3	Foreign body forceps, flexiblewith alligator jaws 3 Fr.,WL = 530 mm	1 no
4	Biopsy forceps, flexiblewith alligator jaws 3 Fr.,WL = 530 mm	1 no
5	Coagulating button electrode3 Fr., WL = 900 mm	1 no
6	Rubber Damru Washers (pac of 10)	1 pac
F	**Specification for URS set 6Fr**	
1	Uretero-Renoscope,6/7.5Fr., 12°, one-step, conical, 8-13.5 Fr., length 43 cm, autoclavable, withangled eyepiece, fiber optic light transmission incorporated, 2 lateral irrigation ports and 1 workingchannel 3Fr. for instruments upto 3 Fr., sealing and tray for cleaning, sterilization and storage.	1 no
2	Cleaning Brush	10 nos

3	Druck Ball	5 nos
4	Yellow washer (pack of 10)	1 pac
5	Rubber Damru Washers (pac of 10)	1 pac
G	**Specification for URS set 8Fr**	
1	Uretero-Renoscope, 8 Fr/9.8Fr., 12°, one-step, conical, 8-13.5 Fr., length 43 cm, autoclavable, with angled eyepiece, fiber optic light transmission incorporated, 2 lateral irrigation ports and 1 working channel 5 Fr. for instruments upto 5 Fr., sealing and tray for cleaning, sterilization and storage.	1 no
2	Cleaning Brush	10 nos
3	Druck Ball	5 nos
4	Yellow washer (pack of 10)1	1 pac
2	Grasping Forceps alligator, double action jaws, 5Fr., length 33-35 cm	1 no
3	Grasping Forceps for stone fragments, double action jaws, 5Fr., length 33-35 cm	1 no
4	Rubber Damru Washers (pac of 10)	1 pac
H	**Flexible Cysto-Nephro – Fibroscope**	
1	It Should consist the following: To be used for both office and outpatients clinic. Allows endoscopic monitoring and therapy with pneumatic and laser energy source. Large angle of view and deflectable distal tip for better orientation upto 110 degree. Deflection of distal tip : upward-210 degree and downward- 140 degree. Instrument channel 7 Fr. 6. Waterproof, fully immiscible for cleaning and disinfection. Sterilizable via EtO and FO gas, Steris and Sterrad.Direction of view should be 0 degree. Working length 37 cm with distal tip diameter of 15.5 Fr. Following accessories are to be included: i. Case for fiberscope, (ii) grasping forcep 5 Fr, for small fragments, (iii) Biopsy forcep 5Fr length 73cm, (iv)Pressure compensation Cap for ventilation during gas sterilization, (v) Leakage tester with bulb and manometer, (vi) Cleaning brush 6Fr flexible long for instrument channel.,LUER-adapter,with seal.	1 no
2	Stone basket 5Fr length 60 cm consisting of 3-ring Handle, basket, coil.	1 no
3	Coagulating Electrode 4Fr length 73 cm	1 no

N.B. QUANTITY AND ACCESSORIES CAN BE ALTERED LATER

4: 4 K Endovision System with working Instruments

A.	**SPECIFICATION OF 4K ENDOVISION SET CAMERA**	
1	• 4K Camera Systems 1) 4 k Camera system and all compatible instrument with 4K system The system should be truly Digital 4K endoscopic video camera. The system should have the maximum Resolution of 3840 X 2160 pixels. Progressive scan and the consistent use of 16 9 formats for input & output to guarantee genuine 4K The system should have facility of optical or Digital Zoom lens to enhance the quality of image size and cross specialty usage of the camera system, regardless of the telescope uses. - inbuilt or External USB port for capturing FULL HD video/HD stills in External USB drive and direct interface of USB recording device from the camera head **Technical Specifications:** Technical Specifications: Image sensor: 3CCD or 3 chip CMOS progressive scan. Pixel: 3840 X 2160 AGC: Microprocessor controlled. Lens: It should be optical Zoom lens f=13 to 29 mm or Digital Zoom 0-2 X Minimum light Sensitivity as per 4 K resolution. Control buttons : 2 or more (freely programmable) video output 2x DVI-D or Output 1x3g SDI out Put or 2 x HDMI or as per 4 k system out put	1(one)

	Input:Keyboard input for character generator or touch screen) Power supply 220 VAC 50 Hz. US FDA/ European CE (issued by a notified body) approved Model should be offered	
	4k Medical Grade Monitor	
1	I) 4k Medical Grade Monitor The monitor should have 4 K 30 inches or more LED monitor with resolution of 3840 X 2160 Screen Diagnal Should have the facility of PIP mode. Specification 4K Monitor with stand/hanged on trolley size 30" or more Power supply 100-240 VAC Video inputs: 2* DVI-D 3G SDI 1* S video composite 1*RGBNGA.1* RS 232, 1*RJ 45 interface OR Video Inputs : DVI Port -1, HDMI Port –2, RS232- 1 & USB-1 OR as per 4 K Standard Video Outputs :1* DVI, 1* 3G SDI.1*Svideo OR through USB 4 outputs via USB Video Outputs :1* DVI, 1* 3G SDI.1*Svideo OR through USB 4 outputs via USB	1(one)
	Suction Irrigation unit Compact	
	Suction Irrigation unit Compact It shall be a combination of Suction /irrigation pump for use in gynecological, laparoscopic and other endoscopic interventions. The adaptation to the correct mode of surgery intended should happen automatically and manually when the correct type of tubing is used. The insertion of pressure lines in to the unit should be simplified for ease of use. The unit should be equipped with electronic, safety circuits that cut the suction/irrigation operation if the unit departs consistently form the present values. **The suction/irrigation unit should have the following features**: It Should compatible with the management system and can thus be controlled from inside/outside the sterile area via Touch screen/touch keypad Easy to user controls for the control of all functionalities Touch controls and digital displays ensure safe and precise adjustment of the set values. During power – up, all system go through and automatic self- test and are only released after a positive result Safety functions that control any departure from operator settings. Audible alarms in case of malfunction. Should have a suction mode that automatically/manual maintains irrigation pressure and flow constant. **The suction/ irrigation unit should have the following technical specifications:** Power Supply voltage : 100-240 VAC Power frequency: 50-60 Hz Operating conditions: $+10^0$c to $+40^0$c Irrigation: Pressure should between 10-400 or more mm Hg Flow Rate should between 10ml1000ml/Min or More Suction under-pressure: Suction Pressure 0 to 0.6-0.8 Bar or 60-80 kpa Pressure Indicator digital display /LED light Marking display/ Bar Graph display flow Indicator digital display /LED light Marking display/Bar Graph display Certified to IEC 60601.1, CAN/CSA 22.2 No. 601.1-M90: Type of protection against electrical shocks shocks: protection class1 Degree of protection against electrical shocks: Applied part of type BF Type of protection against moisture dripwater protection as per IPX 1 or equivalent Us FDA/ European CE (Issued by a notified body) approved Model should be offered.	

	LIGHT SOURCE	
1	**LED 300 with fibre optical cable** Lamp type: LED 15V 300 watt or more. Color Temperatures 5000K and above. Light intensity adjustment:- continuously adjustable either manually or automatically by cameras video output signal. Should be supplied with Diameter 4.8mm ± 5%Length 300cm or more Certified to :- USFDA/European CE (with a notified body).	1(one)
	ELECTRONIC CO2 insufflator	
1	ELECTRONIC CO2lnsufflator CO2 insufflator high flow (18 -45) LITER (220-240) VOLT with power cord It should have following features:- •Insufflation tube for heating the Co2 gas up to patient body temperature •pressure up to maximum 15 mmhg and flow range up to maximum 15l/min. •High flow mode with flow performance up to 50 litre/min or more. •Easy and intuitive use with user friendly colour touch screen for easy and precise setting of set values for pressure and flow and of insufflation mode , as well as for clear display of corresponding set values and actual values •Fully automatic electronically controlled gas refill. •Safety system:- constant monitoring of intra abdominal pressure, any overpressure is reduced immediately. •Electronic control and colour touch screen. •Following data are displayed on touch screen. Power supply 220 VAC 50 Hz Should be supply with; a. High Pressure gas connector with pin index-1 no b. Gas connector for central Co2 supply -1 no c. Universal Wrench -2 nos	1(one)
	Endoscopic Trolley	
	Endoscopic Trolley Equipment cart, rides of 4 antistatic dual wheels equipped with locking brakes, central beam with integrated electrical sub distributor switch 6 sockets grounding plugs, modular in nature (should be able to add shelves and components later if required) for operation theatre use, from OEM, or marketed by OEM C02 cylinder holder Monitor holding arms (lateral)	
	TELESCOPES	
1	Forward- oblique Telescope 30 degree enlarged view diameter 10mm. Length 31 cm autoclavable fiber optic light 4K HD telescope transmission incorporated	2(two)
2	Forward - oblique 4K HD Telescope 30 degree enlarged view diameter 5mm. Length 29 cm autoclavable fiber optic light transmission incorporated. Connection for fiber optic light cable offset by 90degree	2(two)
3	Forward- oblique Telescope 0degree enlarged view diameter 10mm. Length 31 cm autoclavable fiber optic light 4K HD telescope transmission incorporated	2(two)
4	Forward - oblique 4K HD Telescope30 degree enlarged view diameter 5mm. Length 29 cm autoclavable fiber optic light transmission incorporated. Connection for fiber optic light cable offset by 90degree	2(two)
B.	**LAPAROSCOPY HAND INSTRUEMNTS**	
1	Veresspneumoperitoneum with spring loaded blunt inner cannula ,LUER-Lock autoclavabledimeter 2.1mm working length 10-15cm	2 nos
2	Trocar Cannula 10-11 mm diameter with thread and rotating insufflations should have multifunctional valve to prevent damage of sharp instruments and tip lens while passing through the cannula valve. It should have stopcock for C02 insufflation. The working length of the cannula should be 100mm	4 nos

	Trocar Cannula 10- 11 mm diameter: should have multifunctional valve to prevent damage of sharp instruments and tip lens while passing through the cannula valve. It should have stopcock for C02 gas. The working length of the cannula should be 100mm	4 nos
3	Trocar Cannula 5-5.5 diameter with thread and rotating insufflations. Should have multifunctional valve to prevent damage of sharp instruments and tip lens while passing through the cannula valve. it should have stopcock for C02 insufflation. The working length of the cannula should be 100mm	4 nos
4	Trocar Cannula 5-5.5 mm diameter: should have multifunctional valve to prevent damage of sharp instruments and tip lens while passing through the cannula valve. It should have stopcock for C02 insufflation. Trocar should have pyramidal tip with pin holes near the tip forsafety outlet of C02 gas. The working length of the cannula should be 100mm	4 nos
5	Trocar, pyramidal tip, diam. 10 mm working length 100 mm compatible to cannula	4 nos
6	Trocar, pyramidal tip tip 5 mm ,length 100 mm compatible to cannula	4 nos)
7	Double reducer: 13.5/10 & 13.5/5mm	5 nos
8	Reducer: 10/5mm-	5 nos
9	Three piece laparoscopic autoclavable KELLY dissecting and Grasping Forcep. 360 degree rotational sheeth, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm long double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
10	Three piece laparoscopic autoclavable CROCE-OLMI Grasping forceps360 degree rotational sheeth, size 5mm. length 33-36cm double action jaws ergonomic metal handle with plastic finger rings with larger contact area at the finger ring to avoid pressure sores can be dimantied with the press of button(02nos.)	2 nos
11	Three piece laparoscopic autoclavable Bowel Gasping forceps double action jaws, fenestrated, 360 degree rotational sheeth, size 5mm length 33-36cm double action jaws, ergonomic metal handle with plastic finger rings with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button(	2 nos
12	Three piece laparoscopic autoclavable Right Maryland dissector/Forcep, double action jaws fenestrated, 360 degree rotational sheeth, size 5 mm, length 33-36 cm long double action jaws. Ergonomic metal handle with plastic finger rings with larger contact area at the finger ring to avoid pressure sores, can be dismantied with the press of a button.	2 nos
13	Three piece laparoscopic autoclavable Maryland dissector/Forceps, double action jaws, fenestrated, 360 degree rotational sheeth, size 5 mm, length 33-36 cm. long , double action jaws, ergonomic metal handle with plastic finger rings with larger contact area at the finger ring to avoid pressure sores can be dismantled with the press of button.	2 nos
14	Three piece laparoscopic autoclavable ANVIL Grasping forcep, double action jaws, fenestrated, 360 degree rotational sheeth, size 5 mm length 33-36 cm, long double action jaws, ergonomic metal handle with plastic finger rings with larger contact area at the finger ring to avoid pressure sores can be dismantled with the press of a button	2 nos
15	Three piece laparoscopic autoclavable MANHES Grasping forcep with hemostat style ratchet, duck bill 360 degree rotational sheeth with connector pin for unipolar coagulation size 5 mm length 33-36 cm, long single action jaws, ergonomic metal handle with larger contact area at the finger ring to avoid pressure sores can be dismantled with the press of a button	2 nos
16	Three piece laparoscopic autoclavable CLAW Grasping forcep with ratchet 2x3 teeth, 360 degree rotational sheeth size 10mm length 33-36 cm long single action jaws, with ergonomic metal handle can be dismantled with the press of a button	2 nos
17	Three piece laparoscopic autoclavable curved METZENBAUM scissors, 360degree rotational sheeth with connector pin for nipolar coagulation m size 5mm length 33-36cm long double action jaws with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores can be dismantled with the press of a button .	2 nos
18	Three piece laparoscopic autoclavable Hook scissors, 360 degree rotational sheeth, withconnector pin for	2 nos

	unipolar coagulation size 5mm length 33-36 cm long double action jaws with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	
19	Ergonomic plastic Handle with larger contact area at the finger rings with connector pin for unipolar coagulation with or without ratchet, compatible with above asked instruments.	2 nos
20	Dissecting Electrode with exchangeable electrode L-tip autoclavable ergonomic handling size 5 mm length 33-36 cm, with connector pin for unipolar coagulationton	2 nos
21	Three piece laparoscopic autoclavable Hook scissors, 360 degree rotational sheath, withconnector pin for unipolar coagulation size 5mm length 33-36 cm long double action jaws with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
22	Three piece laparoscopic autramaticautoclavabledissecting and Grasping forceps with dolphin nose 360 degree rotational sheath with connector pin for unipolar coagulation size 5 mm length 36 cm, double action jaws, ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores can be dismantled with the press of a button.	2 nos
23	Three piece laparoscopic autramaticgrasping forcepsjaw throat with wavy tooth edge 360 degree rotational sheath, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
24	Three piece laparoscopic autoclavableMaryland bipolar dissecting and Grasping Forceps. 360 degree rotational sheath, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
25	Three piece laparoscopic autoclavableUniversal grasping forceps pyramid shaped and cross cutting toothing 360 degree rotational sheath, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
26	Grasping forceps atraumatic clamp axial grooves with fine horizonal serrations, double jaw action, (without HF) diameter 5 mm, WL 31-33cm, springy branches, cpl. consisting of: Handle, sheath tube Insert	2 nos
27	Three piece laparoscopic autoclavablemixter grasping and dissection forceps, angled, fine pyramid shaped tooth, 360 degree rotational sheath, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
28	Three piece laparoscopic autoclavablespoon forceps, 360 degree rotational sheath, without connector pin for unipolar coagulation size 10 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
29	Three piece laparoscopic autoclavablegrasping and preparation forceps fine horizontal serrations, fenestrated, 360 degree rotational sheath, with connector pin for unipolar coagulation size 5 mm. length 33-36 cm double action jaws, with ergonomic plastic handle with larger contact area at the finger ring to avoid pressure sores, can be dismantled with the press of a button	2 nos
30	High frequency monopolar cord	1 (one)
31	High Frequenct bipolar cord	1 (one)
32	L-shaped hook electrode with unipolar HF connection	1 (one)
33	Spatula / Blunt dissector with unipolar HF connection	1 (one)
34	Needle electrode with unipolar HF connection	1 (one)
35	Grasping forceps spoon shaped 10 mm, WL 31-33cm	1 (one)
36	Three piece laparoscopic Bipolar coagulating Grasping Forceps with overload tissue protection, CLERMONT –FRRRAND MODEL, wide jaws with connector pin for bipolar coagulation 360degree rotational sheeth size 5mm length 33-36cm long, single action jaws ergonomic plastic handle with larger contact area o can be dismantled with the press of a button	1 (one)
37	Three piece laparoscopic Bipolar KELLY dissecting & Grasping Forceps with overload tissue protection, CLERMONT –FRRRAND MODEL, wide jaws with connector pin for bipolar coagulation 360degree rotational sheeth size 5mm length 33-36cm long, single action jaws ergonomic plastic handle with larger	1 (one)

	contact area o can be dismantled with the press of a button	
38	Needle holder with tungsten carbide insert dismantling in to three part namely outer tube handle and inserts, ergonomic pistol handle with disengageable ratchet jaw curved to left size 5mm length 33cm for user with suture material size 0/0 to 7/0	2 nos
39	Needle holder with tungsten carbide insert jaws curved to right dismantling in to three part namely outer tube handle and inserts, ergonomic pistol handle with disengageable ratchet jaw curved to left size 5mm length 33cm	2 nos
40	Macro needle holder with tungsten carbide insert, jaws curved to left dismantling in to three parts namely outer tube handle and inserts, ergonomic pistol handle with disengageable ratchet jaw curved to left size 5mm length 33cm	2 nos
41	Fascial Closure Instrument for subcutaneous ligature of trocar incisions, size 2.0 mm,	1 (one)
42	Injection & puncture cannula 5 mm , WL 31-33cm length with luer lock	1 (one)
43	Myoma Screw 5 mm , WL 31-33cm	1(one)
44	Fan shaped retractor-Rotating, 5mm, WL 31-33cm ,	1 (one)
45	Suction-irrigation tube,5mm with maintenance-free two-way stopcock, thumb control for irrigation and suction wl 27-29cm	1 (one)
46	Ring Applicator with Loader 5 mm , WL 31-33cm	1(one)
47	PCOD Needle 5 mm , WL 31-33cm	1(one)
48	Suction and Irrigation tube anti-reflex surface with two-way stopcock for single hand control size-5 mm length 36cm	1 (one)
49	clip applicator Medium-large dismanteable rotating size : 10mm, length 36cm, for Titanium. Titanium clips : 20 Boxes Titanium Clips medium large & large box with 16 sterile cartridges 10 clips eagh for use with clip applicato	1 (one)
50	Cap Washers- for 5 & 10 mm each for cannula and reducers	50 nos
51	Ring Washers- for 5 & 10 mm each for trocar cannula	50 nos
	All instruments should be USAFDA/European CE (Issued by notified body), compatible to all system	

5: RIRS- Video with CMOS and Fiberoptic

Due to some technical issues, item is deleted.

6: Ultrasound Scanner with all Transducers including ABD Trus Lap and Robotic Arms

	Specifications for Operative Colour Doppler for Onco-Surgery with Intra-Operative probe
1	Should have Ultra High Resolution Imaging and Doppler for Clinical Needs.
2	Should have short boot time
3	Should have graphic processing unit for faster work process
4	Should have speckle reduction technology for enhancing tissue margins for better anatomical visualization and to improve better organ anatomy from different angles
5	Should have optimization of ultrasound image formation by using multi channel synthesis technology to reduce noise and artifacts.
6	19" Flat panel monitor should have swivel facility
7	Should have back illuminated keyboard for easy access.
8	Control panel should be sealed and spill proof for easy cleaning and disinfection
9	Should have height adjustable mechanism with control panel.
10	Should have facility to compensate the motion related imaging artifacts
11	Should have technology to maintain autofocus for entire imaging depth
12	System should have auto axial and lateral gain facility.
13	Should have DICOM capabilities
14	Should have Wifi capabilities
15	Should have an internal hard drive to store images.

16	USB flash memory drive should be the part of the system.
17	Should be of latest generation digital beam former technology
18	Sterilizable remote control for convenient control of the system in the sterile field should be supplied
19	Imaging Modes: System should have following modes: a) B mode. b) M mode c) Color Doppler d) Power Doppler e) Pulsed Wave Doppler f) Continuous Wave Doppler g) Tissue Harmonic imaging
20	In Doppler mode system should have technology to detect high flow in ROI and place Doppler gates automatically and should provide angle independent Doppler velocity measurements with a compatible transducer.
21	Should have facility to connect at least four transducers.
22	Transducer should have pin less connector for easy insertion and to reduce noise.
23	All quoted transducers should be fully immersible for easy sterilization and also compatible with standard sterilization methods like Sterrad and Steris systems
24	System should be able to communicate with daVinici surgical robot's tile pro
25	**The following transducers are to be supplied along with the scanner:**
a	2-6 MHz convex abdominal transducer with an Autoclavable punctures attachment. It should have programmable start and stop button to activate, freeze, unfreeze, and print functions
b	3-14 MHz linear transducer with angle independent velocity measurements for vascular, small parts, testes, breast and thyroid scans. System should be able optimizes Doppler parameters automatically. It should have programmable start and stop button to activate, freeze, unfreeze and print functions.
c	12-4MHz four way deflectable laparoscopic transducer with inbuilt biopsy channel. Transducer should compatible with standard sterilization methods like, immersionand Sterrad.
d	Transrectal transducer with simultaneous biplane imaging facility to visualize, sagittal as well as transverse planes of prostate gland simultaneously. The same transducer should have an enfire array for scanning the apical areas of the prostate during nerve sparing lap radical prostatectomies. Transducer should compatible with standard sterilization methods like immersion, Steris and Sterrad. A reusable biopsy attachment for side fire as well as enfire arrays to be supplied. It should have programmable start and stop buttons to activate, freeze, unfreeze, and print functions. This transducer should be useful for routine multi core prostate biopsies as well as transrectal MRI fusion prostate biopsy
e	Transrectal transducer with simultaneous biplane imaging facility. Transducer should compatible with standard sterilization methods like immersion, Steris and Sterrad. A reusable perinel guide to be supplied. It should have programmable start and stop buttons to activate, freeze, unfreeze, and print functions. This transducer should be useful for routine transperineal prostate biopsies as well as transperineal freehand and stabilized MRI fusion prostate biopsy
f	The electronic transducer for transrectal and trans vaginal imaging with Built in high resolution 3-D and 2-D imaging. It should also be compatible for pelvic floor 3-D study. It should have built in linear array that rotate 360o inside the transducer with no moving parts come in contact with the patient.
	Optional transducers:
g	4-12 MHz multi frequency convex array Robotic drop in transducer for Robot assisted partial nephrectomy. Transducer should be compatible with standard sterilization methods like immersion and Sterrad.
	Fusion specifications (added)
1	Should have Advanced technology of Fusion of MRI with ultrasound images which allows mapping, targeting and tracking of biopsy in real time.
2	Contouring of MRI images should be possible to be done on ultrasound system or another computer with specific software which is then fused with real time ultrasound images to track and target suspicious areas during prostate biopsies in cancer detection
3	It should be high end ultrasound system which gives superior image quality and has advanced features for simultaneous real time bi planar prostate biopsies. It should have an integrated MRI fusion facility and shouild be compatible with multiparametric MRI
4	The High end Ultrasound system should be compatible with Intra-operative transducers which can be completely sterilized along with connectors by various sterilization methods. The transducers offered for prostate fusion biopsy should also have same sterilization features
5	Fusion technology should be integrated in ultrasound system and should have the provision to correct the orientation difference of the MRI and ultrasound images before they are fusedfor a familiar biopsy workflow without the need to conduct additional ultrasound sweeps

6	It should have facility to realign the contours during biopsy procedure to compensate for motion of gland or patient or both
7	It should have navigation sensor attcahed to the transducer to track its position by electromagnetic emitter and receiver for transrectal and freehand transperineal MR fusion prostate biopsy. In stabilized transperineal MR fusion prostate biopsy, a stepper should have an encoder to be connected to the ultrasound system to track the transducer position
8	The fusion workflow should easily import MRI data seamlessly via network image transfer PACS, USB or CD drive
9	The fusion workflow should be such that it minimizes the number of steps and thus take less time to complete the procedure while patient is on the table
10	The ultrasound system and fusion software should provide easy and quick transition between B mode image scanning and fusion workflow during the procedure.
11	It should have ability to record and store 30 biopsy targets which help in revisiting the same core location for active surveillance and comprehensive follow up
12	It should use normal biopsy guns and needle guides available in market and should not require special consumables
13	Fusion technology and worksflow should eliminate need of 3D sweep during conouring
14	The intuitive workflow should ensure that the real time ultrasound image and MRI targets stay aligned with either the free hand transrectal, free hand transperineal or stabilized transperineal biopsy approach, without any need for recalibration or re acquire the 3D sweep during the procedures.
15	The fusion system should have software to perform prostate biopsies by freehand transrectal and transperineal approaches and with stabilized Transperineal approach with the use of stepper and template grid. Should be supplied with 10 such disposable grids(complete set) and distendable transducer covers.
16	Should supply a compatible transrectal transducer with simultaneous biplane imaging facility for routine multi core biopsies. The same transducer should be compatible for freehand and stabilized MRI fusion transperineal biopsies
17	Should supply a compatible transrectal transducer with simultaneous biplane imaging facility with end fire array for routine multi core biopsies. The same transducer should be compatible for freehand MRI fusion transrectal biopsies
18	Should be one integrated system occupying minimum space in OR
19	Should be USFDA and European CE approved /BIS approved
20	All parts including spare parts/accessories/transducers should be covered in Warranty and CMC
21	Price of puncture attachments/consumables should be quoted separately

7: Advance Integrated Videourodynamic with chair C Arm with Ambulatory Urodynamic Work Station on Turnkey Basis

SPECIFICATION FOR ADVANCED INTEGRATED VIDEO URODYNAMICS WITH CHAIR, C-ARM AND AMBULATORY URODYNAMIC WORKSTATION LAB ON TURNKEY BASIS

1. System should be able to perform the following tests: Uroflowmetry, Cystometry , Pressure Flow study, wireless Uroflow with Wireless EMG studies, Automatic Leak Detection & Marker, EMG Studies, UPP, Biofeedback with wireless EMG, Anorectal Manometry, FNIRS, Video Urodynamic & Ambulatory Urodynamic Studies.
2. **Trolley -** The system should be supplied with Original shockproof and wheel with locking mechanism OEM trolley to fit the complete urodynamic system with all in One PC and monitor on a single trolley. Trolley should have integrated inbuilt waterproof keyboard and Mouse/Touch pad to protect from water spillage and Color LED monitor for display. Console should be completely inside the trolley to avoid water spillage.
3. **Computer -** Computer should run on Windows 10 or latest with Core i7 processor or higher with 16 GB RAM & 1TB SSD inbuilt, 1TB HDD external, Original MS Office software, DVD/CD re-writable drive (internal/external), 1 GB Graphic Card, Optical mouse, Microphone & Speaker for EMG, Video Editing Software, UPS of suitable rating for minimum 30 Minute back up and 22-26 inch flat Color LED Touch screen monitor for display and Color Ink Tank or Laser printer.
4. **Configurable Channel Port** - Should have minimum 5 Configurable channels port and should be able to configure up to 16 display channels. Should have 3 regular channels and two spare channels for applications like UPP & Anorectal manometry. Should display at least 7 curves /channel at once.
5. **Pressure Kit** - Equipment should be supplied with Pressure kit containing 3 reusable pressure transducer with bracket, cable, holder fixed on IV Pole attached with trolley. Should have pressure range of (-50 to +350 mm Hg) and automatic zero facility. Should have auto 80-100 mm Hg test/calibration button and through the software for checking the transducers calibration. Should be supplied with 3 reusable pressure transducer extra.
6. Software for multiple connections. Console, Wireless Uroflow and EMG should be connected wirelessly.
7. Should be supplied with Urodynamic Software for conducting Tests with Event Markers, Zeroing facility.
8. Software should have data storage facility.
9. Software should have playback of Test facility.
10. Software should have No Data Loss Technology for Prevention of Data Loss and recovery.

11. Software should have facility to generate report in PDF or Word format & should have facility for editing of report in word format

12. Should have ICS nomogram, Siroky, purr and Schaffer Nomograms, Paediatric Nomograms
13. Software should have Data rate adjustment from 1-18 points for different tests and can be denoted with different colors.
14. Must have Running Tap Water sound.
15. Urodynamic System should have the facility to carry all tests with Air charged catheter / water charged catheter / Electronic Catheter / Microtip Catheter
16. Urodynamic System Should have USFDA/ European CE with notified body with 4 digit no or BIS approved for the quoted model. Must have registered with CDSCO and should attach FORM MD- 15 for imported items.
17. Should have HIS/DICOM facility for connection to Hospital Information system.
18. **Uroflowmetry** - Should be supplied with two weight based Uroflow transducers.
    a. One should be Wired and another Wireless Uroflow Transducer (RF/JIGBEE/XBEE technology based). Both should have flow range 0-50ml/sec with volume range up to 0-2000ml.
    b. Should be supplied with protective cover for flow transducer to avoid water spillage. Should have facility for Auto start or Manual start with Zeroing facility.
    c. Should be supplied with Height adjustable Micturation Chair with folding arms, detachable seat & cover - 1No, Removal Funnel - 3 Nos., Beaker/Collection Jug - 2Nos. Transparent Security Cover for uroflow -10 Nos. Should be supplied with height adjustable uroflow stand with funnel.
19. **UPP -** Should be supplied with UPP module with Puller and stand for doing Urethral Pressure Profilometry.
20. **Wireless EMG Module -**Should be supplied with 1 Channel wireless EMG amplifier with charger. Should be compatible with surface electrodes, needle electrodes.
    a. Should have both Visual and sound EMG.
    b. Should have facility to adjust Sound, Gain & Threshold.
    c. Should have frequency upper and lower limit of 3.5KHZ & 2.4KHZ respectively with sensitivity of 500mvolt for full scale
21. **Infusion Pump -** Should have inbuilt 4 Roller peristaltic pump for infusion with filling rate of 1 ml/min - 150 ml/min with increment of 1ml, 5ml & 10ml by the control of software. Calibration software controlled.
22. **Infusion Sensor -** Should have integrated infusion Sensor / Infusion transducer to check correct infused volume.
23. **Calibration & Infusion Volume -** Should have infusion volume up to 2000 ml and software based calibration control. Should have inbuilt infusion sensor and should measure infusion volume through infusion Sensor / Infusion transducer and not through rotation of pump. Should have weight based infusion transducer.
24. **Data Protection -** Should have software to protect all unsaved data and should help in retrieving datas.
25. **Bladder Scanner -** Should be supplied with hand held Bladder scanner or ultrasound for PVR Measurement**.**
26. **Biofeedback Module with wireless EMG -**System should be supplied with EMG Biofeedback module with wireless EMG for Pelvic floor training. Should have animated games for patient engagement as per ICS standard. Can be attached with Computer & Printer & should be able to give print out. Should be supplied with Anal & vaginal probes.
27. **Video Urodynamics -**Should be supplied with Digital Video Urodynamic software for Video Urodynamic Studies. Should have provision for recording live videos and taking images of bladder during video urodynamic studies and result can be stored in Computer. Should have facility to superimpose bladder images with urodynamic traces. Should be supplied with Compatible CARM with following specification.
28. **Automatic Leak detector module** - Should be supplied with Automatic Leak detector module from same manufacturer, which can be attached to Channel port of machine at one end and second side with meatus of urethra through catheter to detect even small drops of urine leakage which do not come into beaker and mark leak automatically in to software. Leak detection should not involve any camera for recording video or clicking pictures for patient privacy.
29. **Anorectal Manometry** – Should be supplied with 4 channel Anorectal Manometry software and hardware with catheters for doing anorectal manometry studies.
30. **Ambulatory Urodynamics -** Should be supplied with Ambulatory Urodynamics complete set with Laptop, Dongle, Software key, Catheter, Leak Detection Pad & event Marker.
31. **System should be supplied with follow Consumables and accessories-**
    a. Pump Tubing - 100 nos.
    b. Double Lumen Catheter for Cystometry 6 Fr. - 50 nos.
    c. Double Lumen Catheter for Cystometry 8 Fr. - 50 nos.
    d. Triple Lumen Catheter for UPP - 20 nos.
    e. Double Lumen Abdominal Rectal Balloon Catheter for Cystometry 10 Fr.-12 Fr. - 100 nos.
    f. Pigtail Catheter, PVR, 5 Fr. and bladder filling - 10 nos.
    g. EMG Surface Electrode - 300 nos.
    h. Measurement (Connection Tubing) - 50 nos.

i. Air Pressure Cuff for Perfusion - 1 no.
j. Dome for pressure transducer (Disposables) - 50 nos.
k. Anal Probes for Biofeedback - 5 nos.
l. Vaginal Probes for Biofeedback - 5 nos.
m. 4 channel ARM catheter with Balloon 1cm long– 10 Nos
n. Urethral Perfusion Line - 5 nos.
o. 500gm calibration weight - 1 no.
p. Plastic protective cover for Uroflow – 25 Nos
q. 2 Litre Collection Jug – 5 Nos

32. **C-ARM:** Should be supplied with compatible flat panel CARM for doing Video urodynamic studies. It should have minimum following features:

1 It should be based on ALARA (As Low As Reasonably Achievable) principal of radiation dose Management for the safety of operator and patient
2 Should have orbital travel of 140 degree or more
3 Should have C-Arc depth of 700 mm or more
4 Should have Source to image distance of 1000 mm or more
5 Should have Generator frequency of 220 KHz or more
6 Should have Continuous Fluoroscopy mA range of 0.1 mA to 4.5 mA or more
7 Should have 0.1 to 2.25 mA or less in low dose paediatric fluoroscopy mode
8 Should have 0.6 to 8 mA in Boosted fluoroscopy & Pulse Fluoroscopy mode
9 Should have KV rise time of more than 40 KV/sec or more in Auto Dose rate control mode for radiation safety in auto mode
10 Should have Dynamic Flat Panel Detector of size of 9" x 9" with resolution of 1.5K x1.5K or more
11 Should have dual focus stationary anode X-Ray tube
12 Should have single 32" or more High Resolution, flicker free Flat Screen Monitor with split screen display of Live image & Saved Memory Image
13 Should have Digital Image Memory PC based with storage of more than 10000 images in 1.5K x 1.5K or higher resolution format
14 Should have USB Pen drive provision for external image storage
15 Should be DICOM ready, DICOM Work list, DICOM Print and ready to connect with HIS/RIS/PACS system
16 Supplier should do the radiation protection of window door according to AERB Guidelines
17 Radiation hazard board with red lamp in front of the UDS Lab
18 Accessories should supply along with C-Arm:
   a Light weight Lead Apron (4)
   b Thyroid Shield (4)
   c Gonad shield (4)
   d Voltage stabilizer for image handling function (1)
19 Others:
   a It should have valid AERB type approval
   b It should be certified from BIS, European CE Certified from 4 digit notified body or USFDA approved
   c Manufacturer must have positive net worth and undertaking must be produced in bid
   d Manufacture should not be black listed/debarred in any Central or State Government body in last ten years from the date of tender opening.
   e Radiation Protection accessories must be of reputed brand only and must be ICMED 13485 certified, meeting the requirements of 89/686/EEC from a notified body and manufacturer of radiation protection accessories should be ISO 13485 and ISO 9001 certified
   f Internal civil & and electric work & and establishment of a paediatric-friendly Video urodynamic lab should be done by the company. Bidder has to do Lead Protections on Doors and Windows for radiation safety as per AERB Guidelines. The wall of UDS room should be painted with child-friendly pictures. Electric supply up to the single point in the room will be provided by the buyer. All other electric wiring and electric sockets and switch must be provided by the seller. Bidder encourage to make a site visit, before bidding, so that turnkey work can be planned and coasted better.
   g. Bidder must have experience in establishing Video Urodynamic Lab with C-ARM at least at two centres

33. **Neurodynamic Study** - Should be supplied with Transcutaneous Muscle & Nerve Stimulator for the treatment of Incontinence and for urogenital use and should be supplied with electrodes for Neurodynamic studies.

34. **Video Urodynamic Chair -** Should be supplied with 3 Motors Radiolucent Video Urodynamic Chair for doing Video Urodynamic Studies with following specifications:-

- Motor - 3 motors
- Positions for studies - Sitting , Supine and 90 Degree Standing Position

- Chair adjustments - Trendelburg, reverse Trendelburg & back position adjustments
- Should have Side mounted cantilevered design for Physician anterior, posterior, lateral and oblique views without obstruction.
- Should be rated IPX^ protection against water incursion
- Should eliminate risk of catheter falling out during ambulation
- Should have Radiolucent Carbon Fibre sheet and back for complete Head to Toe imaging.
- Should Four double wheel caster for easy manoeuvrability
- Should have Remote control
- Should have perineal cut
- Should have lithotomy attachments
- Should have attachments for funnel
- Should have length with foot rest – 190cm – 200 cm
- Should have Height with cushion – Max 130 cm
- Imaging area – 150cm – 160 cm
- Patient load capacity- 250 kg in all positions
- Manufacturer should have ISO/CE/FDA/BIS approval
- Should be supplied with Plastic funnel, Arm rest holder, arm rest, Leg rest holder and leg rest and side rail.
- Chair should be registered with CDSCO for import and Bidder should submit OEM authorization

35. **FNIRS -** Should be supplied with FNIRS for checking Oxygenation and deoxygenation in blood of detrusor muscle during voiding Cystometry and should be synchronized with urodynamic traces to compare both findings.
36. **Optional / Upgradation Accessories -**Should be upgradable to following & price should be quoted separately & will be freezed for 5 years.
    a. Ambulatory Urodynamics complete set with catheters and leak detection pad having live streaming facility.
37. **Internal Civil Work -** Firm should do Internal Civil work in UDS Lab, Like Painting and designing of UDS Lab, Wash basin fittings, Curtain partition, two chairs, storage cabinet, Lead protection on Doors and walls, fan , A/c , Board for UDS lab and one Plasma TV for biofeedback.
38. **Past Experience -** OEM/Bidder should have experience of establishing Video Urodynamic Workstation Lab with identical specification at least at three premier institutes in India in last Three financial years and supply order copy alongwith installation report or performance certificate should be attached and at least one should be in the name of Bidder with installation report and performance certificate.
39. Bidder must submit Detailed Technical Quotation of their offering along with Technical compliance with supporting documents like Technical brochure, Feature sheet, Manuals etc with duly numbered point wise in support of their claim. Without this their bid will be rejected out rightly.
40. Bidder should be ready for Physical Demonstration of the quoted model as per technical specification of tender if asked by user.
41. Manufacturer & Bidder both should have ISO Certification for proper maintenance of equipment.
42. Bidder quoting Products more than one overseas manufacturer should submit Authorization from each manufacturer for supply and maintenance of equipment for 10 Years.
43. System should be supplied with 5 Years warranty and price of CAMC for next 5 years to be quoted separately (Will be considered for price calculation).

Firm should quote price of Consumables/Accessories/Spares separately & will be freezed for 5 Years warranty period (Will not be considered for price calculation).

8: DA Vince Robotic System by Intuitive

Due to some technical issues, item is deleted.

9: Flexible Disposable Digital RIRS

1 (A): <u>Specifications for Flexible Digital Uretero-renoscope</u>
Flexible Digital Ureterorenoscope

1.1) Digital CMOS imager, Chip on Tip technology

1.2) Direction of view: zero degrees (forward-viewing)

1.3) Field of view: 110 degrees or more

1.4) Observation depth of field : 2mm – 50 mm

1.5) Integrated camera head: no secondary external attachments are required.

1.6) Display the usage time of each scope

1.7) Flexible insertion sheath with logical deflection mechanism

1.8) Active deflection tip length should be 6.5 cm or more

1.9) Deflection of scope tip should be possible to 270 degrees in both the directions

1.10) Insertion tip diameter: 7.7Fr or less.

1.11) Insertion sheath outer diameter: 8 Fr or less.

1.12) Working channel [ID]: 3.3Fr or more.

1.13) working length: 650 to 670 mm

1.14) compatible with laser lithotripsy: uses existing technologies and familiar surgical tools

1.15) It must be compatible for sterilization methods with ETO, Steris &Sterrad.

1.16) It should also be compatible for full scope including hand piece in high Level Disinfection by complete immersion in liquid chemicals like Cidex&Paracef.

1.17) Must connect to a digital video processor unit with built in cold light source with LED bulb as light source , integrated 14 inch screen or bigger with provision of connecting via DVI and SDI connection ports to view live image on external medical grade monitors.

1(B): Specifications for Flexible Digital Uretero-renoscope

Digital Video Processor Unit

1. Digital recording provision for both Still & Moving images directly on a USB device.
2. Must have an output for HD (1080p) video feed to connect via DVI/SDI connection ports to view a live image on external Medical grade monitors.
3. Should include an integrated 14-inch HD screen or bigger in the video processor unit
4. Compact and ergonomically designed with an easy-to-carry handle.
5. Must have auto-brightness control with provision for adjusting brightness during surgery.
6. Must include auto white balance function along with an option to adjust the white balance if required with a dedicated button.
7. Should have a built-in cold light source with LED bulb as light source (Minimum LED life: 10000 Hours)
8. Must connect to a flexible digital ureteroscope with OD of 7.5 Fr and compatible for sterilisation methods with ETO, Steris, Sterrad and also compatible with complete immersion of full scope including hand piece in high level disinfectant like cidex and paracef.

10: Open Surgical Instrument for Renal Transplant, Self Retacning Retractors

SPECIFICATION OF OPEN SURGERY INSTURUMENTS-

1. Final specs especially regarding length, tip width etc will be decided at time of procurement
2. Fine quality needle holders of length 8-10 cm and 10-14 cm and 20-25cm with fine tip for 4-0 , 5-0 and 6-0 suture needle(debakey type, mayo hegar type and crile wood type)
3. Fine quality needle holder of length 8-10 cm and 10-14 cm and 18 to25 cmwith broad tip for 1-0 and 2-0 suture needle(debakey mayo hegar and crilewood type)
4. Fine quality tc coated curved metzenbaum scissors of length 8 -10 cm and 10-14 cm with tip size 2mm to 4mm Bookwalter self retaining retractors
5. Vascular clamps to be applied externa iliac vein and internal iliac artery for renal transplant-straight,curved with angle and satiskey type(types include-ligature,leland jones, satinsky, morris angled, anastomotic forceps derra)length varying from 10 to 30 cm
6. Bull dog straight and curved types of length 3-5 cm and 7-10 cm
7. Hemostats of sizes ranging from 5cm to 15 cm(mosquito and Kelly type)-curved and straight both
8. Allis forceps of sizes ranging from5-15 cm and tips containg 1 to 4 teeth
9. Debakey atrauamatic hand forcep of size ranging from 8-18cm and tip size ranging from 2 to 3mm
10. Castrovij needle holders with round shaft locking type wiith length ranging from 8 to 20 cm
11. Heparin cannula straight and curved type with length 3 to 8 cm and size of 14- 22 guage
12. Ring tip forceps for hand with size ranging from 8 cm to 18 cm and diameter of tip from 1mm to 4 mm-both straight and anlgled
13. Fine quality potts scissor of size 10cm to 18 cm
14. Balfour self retaing retractors
15. Hand tissue forceps –plain length 10-18cm
16. Hand tissue forceps –toothed –length 10-18 cm and tooth should be fine and broad
17. Retractors –daevers ,kochers,mickulicz and Kelly type
18. Wound spreader mastoid reractor type of varying length from 10-20 cm including traight one and hinged ones
19. Metal bowel of capacity 0.5 liter to 1. 5 liter
20. Kidney tray of various sizes 20 cm to 30 cm length and breadth 10-15 cm
21. Trays and container for storing and sending instruments to autoclave

22. Right angled dissecting forceps of length ranging from 10 to 25 cm and tip length ranging from 1 to 3 cm and tip width of 1-3mm
23. Babcocks forceps of length 10-25 cm with tip ranging from 2-4 mm
24. Micro needle holder castrovij type with straight tip locking jaw round shaft length ranging from 8 to 20 cm for holding 5-0 to 8-0 suture
25. Mallet with plastic handle 15-20 cm and 25-30 cm
26. Mayo table for instruments
27. Sitting chair with cushion arm support and adjsutalble height for operating surgeon
28. Normal table of lenth varying from 1.5 to 4 meter and breadth 1 to 2 meter with wheel having lock for arranging instruments in operation theater
29. Loupe with magnification customized type for renal transplant surgery(3.5X)Omnitract self retaining retractors for renal transplant
30. Scissors needle holders and forceps should be TC coated
31. OMNITRACT RETRACTORS or similar for Renal transplant
32. Ligaclip applicator fpr open surgery of small, medium, large & very large size of length 15cm and 20 cm with straight & curved tips.

Note: Final design like length, tip width, angle etc to decided on seeing designs and diagrams during pre-tender bid

11: Flexible Digital Uretero-Renoscope

A	**SPECIFICATION OF FLEXIBLE URS**	
1	Uretero-Reno Fiberscope with contra positive deflection mechanism, steerable, deflection of distal tip of at least 270°/270°, direction of view 0°, angle of view of at least 88°, working channel inner diameter 3.6 Fr., sheath size 7.5 Fr., working length of at least 67 cm Following accessories should be included: Carrying Case, Leakage Tester, with bulb and manometer, Cleaning Brush, flexible, for working channel diameter 1.2 - 1.8 mm, length 150 cm, LUER-Adaptor, with seal	1 no
2	Grasping Forceps, 3 Fr., double action jaws, flexible, length100 cm	1 no
3	Biopsy Forceps, 3 Fr., double action jaws, flexible, length 100 cm	1 no
4	Stone Basket, sterile, disposable, 2.5 Fr., length 120 cm	1 no
5	Coagulating Electrode, 3 Fr., unipolar, length 110 cm	1 no
6	Cleaning adapter for instrument ports	1 no
7	Sealing for instrument ports	1 no
B	**High Power Suction Machine**	
1	Housing : Power Coated Heavy MS Cabinet Capacity : 730 mm Hg at 60 LPM,Noise Level: < 50dBa Pump Type: Oil free double piston,Jars: Polycarbonate 2x2.5 liters cap with mechanical over flow system and ABS lid,Filter: Reusable bacterial filter Tubing: Non collapsible suction tubing,Vacuum Gauge : 2.0,"Power : 220/230VAC 50Hz sinlge phase with two sets of extra jars with lids & 5 set of patient tubing ISI, CE Certified	1 no
C	**PEDIATRIC CYSTOSCOPE,RESECTOSCOPE& URETHROTOME SET**	
1	Straight Forward 0 & 30 degree Telescope, diameter 1.9mm/2.1mm, autoclavable,Length18cm,fiber optic light transmission incorporated	1 no
2	Cystoscope- Urethroscope Sheath,9.5Fr,length 14cm with instrument channel 4Fr with obturator and 2 LUER-lock connectors	1 no
3	Cystoscope-Urethroscope Sheath, 11Fr,length 14cm with instrument channel 5Fr with obturator and 2 LUER-lock connectors	1 no
4	grasping forcep,3Fr, double action jaws,flexible,length 28cm	1 no
5	Biopsy forcep,3Fr,double action jaws,flexible,length 28cm	1 no
6	Ball electrode,3Fr,length 53 cm	1 no
7	needle electrode,3Fr. Length 53 cm	1 no
8	Resectoscope Sheath ,including connecting tubing for inflow,11Fr and obturator	1 no
9	Urethrotome Sheath,10Fr,with obturator	1 no
10	Telescope bridge,with 1 lockable channel to be used with resectoscope sheath	1 no
11	Telescope Bridge to be used with Urethrotome sheath	1 no
12	Working for 1.9mm ,the thumb support is movable and inrest position the electrode is inside the resectoscope sheath	1 no
	Working for 2.1mm ,the thumb support is movable and inrest position the electrode is inside the resectoscope sheath	1 no
13	cutting loop,angled	1 no

14	coagulating electrode angled,blunt	1 no
15	coagulating electrode,hook shaped,ball end	1 no
16	coagulating electrode,without ball end.	1 no
17	coagulating electrode,angled,pointed.	1 no
18	Cold knife,straight	1 no
19	Cold knife,round	1 no
20	High frequency cords(Monopolar	1 no
21	Protection tube for sterilization and storage of electrodes.	1 no
C	**Flexible Sensor Cystoscope for FLEXHD**	
	Flexible Sensor-Cystoscope 16.2fr wl 400m working channel 7.5Fr, slanted distal tip, deflection +210°/-210°, two function buttons, for connection to Flex HD, LED-illumination, distal Sensor, Fix focus It should be included accessories; Leak tester, pressure equalization valve, disposable cleaning brushfor working channel ,Luer sealing cap,irrigation set, Control lever distal deflection up/down	**1 no**
D	**Flexible Sensor Ureterorenoscope for FLEXHD**	
	Sensor Ureterorenoscopeflexible, sheath 8.7fr. working channel 2,3.6fr., distal tip 6.6fr.atraumatic stainless steel tip, wl 680mm, angle of view 90^0deflection +270°/-270°, two function buttons, for connection to, distal Sensor, Fixfocus,LED integrated to handle for Lighting,ergonomically contoured handlewith axial camera cable,Endoimagesquare,1.5 x zoom, detail enhancement,automatic white-balanceand light control,no focusing necessary,Cable length2.5 m It should be included accessories; Leak tester, pressure equalization valve, disposable cleaning brushfor working channel ,Luer sealing cap,irrigation set, Control lever distal deflection up/down , Compatible endocameraFlex HD **OR** Sensor Ureterorenoscopeflexible, sheath 9.9 fr. working channel 2 ,3.6fr., Laser channel2.4 Fr. distal tip 5.2fr.atraumatic stainless steel tip , wl 680mm, angle of view 90^0deflection +270°/-270°, two function buttons, for connection to, distal Sensor, Fixfocus,LED integrated to handle for Lighting, ergonomically contoured handle with brake for locking the instrument tip and axial camera cable,Endoimagesquare,1.5 x zoom, detail enhancement,automatic white-balanceand light control,no focusing necessary,Cable length2.5 m It should be included accessories; Leak tester, pressure equalization valve, disposable cleaning brushfor working channel ,Luer sealing cap,irrigation set, Control lever distal deflection up/down , Compatible endocameraFlex HD	**1 no**
E	**SINGLE INTERGRATED SINGLECYSTO URETHROSCOPE ALSO CALLED AS FEMALE CYSTOURETHROSCOPE OF 14 TO 18 FR**	**3**

N.B. QUANTITY AND ACCESSORIES CAN BE ALTERED LATER

Sd/-
Director,
IGIMS - Patna.