राजेन्द्र आयुर्विज्ञान संस्थान
(झारखण्ड सरकार का एक स्वयतशासी संस्थान)
राँची–834009 (झारखण्ड)
दुरभाषः 0651–2541533, फैक्सः 0651–2540629,
E-mail: rimsranchi@rediffmail.com

RAJENDRA INSTITUTE OF MEDICAL SCIENCES
(An Autonomous Institute under Govt. of Jharkhand)
Ranchi-834009 (Jharkhand)
Phone: 0651-2541533, Fax: 0651-2540629,
Email : rimsranchi@rediffmail.com

Re Tender notice no. RIMS/Stores/ME(4)/ 8647, Dated 12.12.2017

NOTICE INVITING E-TENDER

FOR SUPPLY & INSTALLATION OF RADIOLOGICAL EQUIPMENT (CT, MRI, ROBOTIC TOOL, CR SYSTEM, SIMULATOR etc.) AT RIMS, RANCHI.

Due to single bidder or no bidder for the undermentioned items of Radiology Department, the previous NIT No. 13277 dated 16.12.2016 for radiology department is being cancelled and re-tender is invited for supply & installation of CT Scan, MRI, Robotic Tool, CR System, GI Sterilizer & Diagnostic Ultrasound Stimulator on turnkey basis in two bid system (Technical bid & Price Bid) from the original equipment manufacturer or experienced authorized dealer only through e-tender process.

A.	**Important dates for Tenders**	
1	Date of uploading of sample tender document on website.	22.12.2017 (The intending bidder may visit RIMS website: www.rimsranchi.org & also on NIC website : www.jharkhandtenders.gov.in
2.	Pre bid meeting for discussion on various technical issues regarding terms, conditions & specification etc.	On 10.01.2018 at 12:30 P.M at RIMS. All the intending bidders must attend the pre-bid discussion meeting for clarification of their queries & requirements of RIMS, No claims will be considered after pre-bid meeting and finalization of tender documents.
3.	Date of uploading of final tender documents with amendments in sample tender paper, after pre-bid discussion meeting.	19.01.2018 (The intended bidder must download the final amended tender document & they have to bid in accordance to final tender paper). The bidders have to submit demand draft for Rs. 5000/- in favour of "**Director, Rajendra Institute of Medical Sciences, Ranchi**" in original at RIMS office as cost of tender document & DD of Rs. 10,00,000/- (Rupees Ten lacs) as EMD.
4	Date of Start for submission of E-tenders	01.02.2018 from 03:00 P.M
5.	Last date of submission of e-tenders	On 14.02.2018 till 04.30 P.M
6.	Opening of technical bid	On 19.02.2018 at 12:30 P.M. All the bidders must have to confirm the submission of original demand draft for tender documents cost & EMD (as mentioned in tender document) at RIMS, Ranchi. Latest by 04.30 P.M. on or before 17.02.2018. The e-tenders of only those bidders will be opened, whose demand drafts will be submitted on due dates.

Note : 1.For details of tender terms, conditions & specification please visit RIMS website : **www.rimsranchi.org or** www.jharkhandtenders.gov.in from 22.12.2017 for sample tender paper to attend the pre-bid meeting.

2. Before participating the pre bid the bidders may physically visit Radiology department, RIMS and if needed they may discuss with Concerned HOD, RIMS, Ranchi regarding their queries.
3. In case on any of the above last date, if announced government holiday, the tender process will continue on the very next working day on the same time and venue.

Sd/-
Director
Rajendra Institute of Medical Sciences
Ranchi

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Re-Tender notice no. RIMS/Stores/ME(4)/ 8647, Dated 12.12.2017

Sample Tender paper for instruments, Machine, Equipment (MRI, CT, ROBOTIC TOOL, CR SYSTEM, ENDOSCOPIC STERILIZER, STEAM STERILIZER, DIAGNOSTIC USG SIMULATOR) of Radiology department, RIMS, Ranchi

Downloaded by:

M/s _____

_____

_____

_____

Signature & Seal of Bidder

E-Tender for supply & installation of instruments, machine, equipment (CT, MRI, USG etc.) of Radiology department of RIMS, Ranchi

To,

M/s _____

_____

_____

_____

Dear Sir,

Director, Rajendra Institute of Medical Sciences, Ranchi invites you to tender for supply & installation of instruments, machine, equipment (CT, MRI, USG etc.) of Radiology department as mentioned hereunder including civil / mechanical / electrical works (if any) required for installation of these equipments on turnkey basis.at RIMS, Ranchi.

The conditions of contract which will govern any contract made are as under. Any special conditions attached in tender will also be part of the conditions

If you are in a position to quote for supply & installation in accordance with requirements stated in tender notice & tender form, you must also furnish all the information called for, along with your tender.

This tender is non transferable.

All legal matter in respect to this tender will be subject to jurisdiction of Hon'ble Jharkhand High Court, Ranchi.

The last date of submission of online tender paper only through e-tenders : 14.02.2018 latest by 4:30 p.m.

Note :- The list of equipments or items with required specification is ecnsloed with this tender document.

The bidders have to submit tender document fee @Rs. 5000/-. Without tender fee the tenders will not be entertained. Similarly the bidders also have to submit the EMD in form of Demand Draft of Rs. 10,00,000/- (Ten Lakhs) only in favour of Director, Rajendra Institute of Medical Sciences, Ranchi.

Yours faithfully

Sd/-
Director
Rajendra Institute of Medical Sciences,
Ranchi

General Terms & Conditions

1. The terms and conditions mentioned in tender notice no. 8647 dated 12.12.2017.
2. The tender should be submitted online with specification, literature, leaflet along with catalogues etc. leaving no room for back references.
3. Bids are to be submitted in two parts viz. (A) Technical Bid containing complete technical aspects including technocommercial documents, catalogues, literature, leaflets, undertakings, Affidavit etc., except price bid & (B) Price Bid containing price elements only.
4. Technical Specification should be in the proforma / format given below :

A. Technical Specification Proforma for department of …… …….. (for Major Equipments)

Sl. No.	Required technical specification as mentioned in tender form	Tenderer's detail technical specification of the equipment or complete system for which they are quoting	Remarks or any other extra advantaves of the quoted model or attachments (if any)

Note: In their offers, the bidders must have to mention clearly the supporting items or consumables required (if any other than the complete job) to run the system in the pre-bid discussion meeting, otherwise the bidders have to provide all the consumables without any extra charges after finialisation of tender process.

B. Tenderers Technical Details of turn key works

i. **Civil /Electrical/Mechanical / furnishing etc works to be done (if any) by the bidders under turnkey project.**

Sl. No.	Tenderer's detailed item list/work list (the bidders have to specify and mention item wise list, Qty, measurements etc in details of turn-key works)	Quantity offered by the tenderer

ii. Electrical works : (If any required under turnkey)

Sl. No.	Tenderer's detailed item list/work list	Quantity offered by the tenderer

Note :

1. All the electrical items including Air conditioning, UPS, Voltage Stabelizers, Switches, inner room wiring, earthing etc. will have to be supplied & installed by the tenderer under turn-key for smooth functioning of their supplied items.

iii. Furnitures works : (If any required to run the machines under turnkey)

Sl. No.	Tenderer's item list	Quantity offered by the tenderer

1. Before quoting the tender & before participating in the meeting the tenderers must have to visit the sites & they have to discuss with authority for location & confirmation of site working site.
2. Before finalization of the tender, if needed by the technical committee, the tenderers have to arrange on site practical demonstration of their quoted machines (major equipment) to the members of technical committee on any of their pre installed sites on tenderer's own cost.

Full signature of the
tenderer with seal
Designation : ……
Dated : ……

5. **Price Bid Proforma / Proforma of BOQ :** Rates are to be given in Rupees (INR) only.

Sl. No.	Item descry ption	Iem code	Qty	Units	Basic Rate	Excise Duty	GST	Freight charges	Any other taxes	Total amount without tax	Total amount with tax
1	3.0 Tesla MRI System										
1.01	MRI System with five years comprehensive warranty of Complete Equipment	01	01	Nos							
1.02	Turn-key works										
1.03	CMC after 5 years warranty- 6th Year										
1.04	7th Year										
1.05	8th Year										
1.06	9th Year										
1.07	10th Year										

Note :

1. Comprehensive guarantee/warranty must be with all accessories, spares, labour charges and maintainance of turnkey works.
2. Similarly CMC will be with all accessories, spares, labour charges and maintainance of turnkey works.
3. For machine & equipments Price of C.M.C. for five years will also be considered during price comparative evaluation without CMC, the tender will be rejected at the time of evaluation.
4. Warranty as well as CMC will cover (inclusive of) all spares, accessories & turnkey works and it will also cover :-
   i. X-Ray, C.T. tubes, Magnets, high tension cables etc.
   ii. Helium replacement
   iii. Any kind of motor
   iv. All Plastic & glass parts including bulbs, tubes, cables etc.
   v. All kind of sensors
   vi. All kind of coils, magnets, probes, transducers, cuffs, paddles, cables, chilling materials, coolants, chart recorders, patient circuits, tube, bulbs, electrodes, humidifiers, sensors, cassettes, printers & images, UPS including the replacement of batteries, Air-conditioners, fuses, transformers, monitors, cameras, stabilizers, furnitures, aprons, badges, radiation accessories, software & Hardware, chambers, phantoms & other accessories (if any) will be supplied & installed by the bidders without charging any extra cost under warranty & C.M.C.

6. During warranty as well as CMC period, the contractors have to supply or replace all the accessories like - USG Probes, Transducers, Cuffs, cables bulbs, nobs and all other consumables or disposables required to run the machine (other than films, papers) without any extra charges.

In case if the bidders require to mention their disposable as chargable then they have to confirm the life of their disposables or reusables life of the same in respect to time or number of uses. Their such items will be compared during price evaluation. If they do not quote any such items in their bid, then it will be assumed that they have quoted their rates with all such

items to run the machine for for further 10 years from the date of installation. No extra payment from RIMS will be done in such case.

Full signature of the
tenderer with seal

Sd/-
Director
Rajendra Institute of Medical Sciences
Ranchi

Name
(in capital letters)

Designation

7. List & specifications of equipments :- Separate list is enclosed herewith this tender documents. All the bidders have to get it confirmed at the time of purchase or during downloading of tender documents.
8. The tenderers have to mention clearly the names and technical specifications of the relevant accessories which they will supply along with the main equipment, free of cost in their technical bid.
9. The price should be inclusive packing, carriage & installation cost.
10. The total cost of each equipments should be quoted in figures and words.
11. The price quoted should be valid for at least two years from the date of opening of tender.
12. The intending tenderers should produce the copy of manufacturing registration certificate. In case of authorization – original authorization certificate issued by the manufacturer in the name of Director, RIMS, Ranchi. The authorization must be valid at the time of tender opening.
13. The tenderer must enclose registration certificate of Jharkhand GST or If the bidding agency is not registered under Jharkhand Sales tax (JGST) department then they must give an undertaking through notary affidavit that “They will supply & install the equipment/items at fixed destination after payment of JGST/Jharkhand Sales tax on their own & they will make their own arrangements for customs clearance in case of imported equipments. They shall not demand any document from Director, RIMS for clearance or duty exemption/waiver/relief in this regard.”
14. The tenderer should furnish the warranty / guarantee period of the complete system.
15. The tender without EMD & without tender cost will be ignored straightway.
16. Incomplete tender will be summarily rejected.
17. The EMD will be refunded in full to the unsuccessful tenderers after finalization of tender and in case of successful tender, the EMD will be refunded only after expiry of warranty / guarantee period.
18. The full EMD shall be forfeited in case of backing out of the offer after acceptance.
19. The successful tenderer have to supply the items in accordance with the specification as finalized and approved by the purchase committee.
20. If there is any need then the bidders have to do the construction or modification works by their own including all mechanical & electrical wroks as per requirement of their quoted equipments for fully functioning of the complete project including all the equipments or for all the machines under the turnkey project. They have to quote accordingly. No consideration regarding extension of work or escalation of rates will be made after finalization of tender.

Full signature of the tenderer
With seal and date

Designation.

21. Contractor Form 'A'

Telegraph Address :- ……..
Telephone No. : ……..
Telex No. : ……
Fax No. …….

From

_____
_____
_____
(Full name and address of the tenderer)

To

The Director
Rajendra Institute of Medical Sciences,
Ranchi.

Sir,

1. I / We hereby offer to supply the stores detailed in the schedule here to such position thereof as you may specify in the supply order at the price given in the said schedule and agree to hold the order (offer) open till it is opened. I/We shall be bound by communication of acceptance within the prescribed time.
2. I / We have understood the instructions to tenderers and terms conditions of contract for contract concluded by Director, RIMS as contained in schedule & tender notice. We have thoroughly examined specification drawing or pattern quoted in the schedule here to and am/are fully aware of the nature of the stores required.
3. The following pages have been enclosed to and from part of this tender's technical bid …… ……

Yours faithfully

Signature of tenderer

Address ……
Dated ……..……
Seal…….

22. All documents duly completed, signed and sealed should be enclosed with your tender offer failing which your quotation will be treated as incomplete.

Technical compliance report duly filled and signed with seal of the bidder.
(It is mandatory to fill the compliance repor5t by all the bidders)

The bidders must fill all the rows/columns of this compliance report. This report will be inspected & evaluated by purchase committee and accordingly documents will be verified on the concerned page numbers.

Sl. No.	Enclosures required	Have you enclosed it? write clearly Yes or No	If yes then on page no. of this bid.
1.	Photocopy of JGST (Sales tax) Registration certificate in Jharkhand State.	Yes or No	Page No. ……
	OR If the bidding agency is not registered under Jharkhand sales tax department, then they must give an undertaking through notary affidavit that "They will supply the equipment/items at RIMS, Ranchi after payment of	Yes or No	Page No. ……

	JGST/Jharkhand Sales tax on their own & they will make their own arrangements for custom clearance in case of imported equipments. They shall not demand any document from RIMS for JGST/custom clearance/duty exemption / waiver/relief in this regard".		
2.	(i) Whether manufacturer or authorized dealer	Yes or No	On Page No. …….
	(ii) If authorized dealer then write names of the original manufacturers and enclose the authorizations issued to you. e.g.	Yes or No	On Page No. …….
	a. Authorization letter of M/s ……..	Yes or No	On Page No. …….
	b. Authorization letter of M/s …….. and so on	Yes or No	On Page No. …….
3.	Income Tax PAN No. (e.g. XYZA1234G) also mention clearly that PAN No. of proprietor or PAN no. of Company	Yes or No	On Page No. …….
4.	EMD in form of Demand Draft No. ……. dated ….. issued by (name of bank) …… amount Rs. 10,00,000.00 (Ten Lakhs) only in favour of Director, RIMS, Ranchi. **(Note :- The bidders also have to submit Rs. 5,000/- for tender papers & Photocopy of the drafts to be attached in technical bid.** **Original DDs to be submitted in RIMS, Ranchi on due dates as mentioned in NIT.**	Yes or No	On Page No. …….
5.	Affidavits through first class magistrate / Notary Public, mentioning that – (a) "Our company has not been black listed or convicted in the past by any Hospital Organization or by any Government / Semi government organization / P.S.Us / C.B.I / C.C.I & free from all kind of litigation/allegations, (b) That the firm has no vigilance case/CBI/FEMA/CCI case pending against him/supplier (Principal) (c) That the firm is not supplying the same item at lower rate quoted in the tender to any government organization or any other institute".	Yes or No	On Page No. …….
6.	Technical specifications with catalogue & dimensions of equipment, accessories & details of turnkey works. The bidders have to provide complete layout plan with details of measurments, quality, quantity etc of the civil constructions, furnishing works, plumbing, Air conditioning & electrical works (if any) required are to be done by the bidder within their offered prices for installation & functioning of the complete system.	Yes or No	On Page No. …….
7.	I.T. return certificate & balance sheet of the bidders for last three financial year having minimum turnover of Rs. 1,00,00,000/- (Rupee One Crore only) in any one year within last three years.	Yes or No	On Page No. …….

8.	Bidders acceptance letter/undertaking that they shall provide five years comprehensive warranty & then after five years comprehensive maintenance contract with all spares, accessories & labour charges for all the equipments.	Yes or No	On Page No. …….
9.	ISO/CE/BIS/FDA certificate in the name of equipment manufacturing company. It must be shown in the certificate that this certificate is for particular product. (As per need of the BOQ)	Yes or No	On Page No. …….
10.	For price justification all the bidders have to enclosed the order copy/copies issued by any govt./semi govt./PSUs for the same equipment model in th bidder offer. **Note : In the technical bid the bidders shall enclose the order copy without price i.e. after deliting the prices but in their price bids all the bidders must have to enclosed the previous order copies with their price value.**	Yes or No	On Page No. …….
11.	The bidders have to enclosed/confirm the list of institutions regarding supply, installations and functioning of the same make & model equipment within last three years. The purchaser or technical committee may verify or confirm the bidders documents from the concerned institutes. (Not mandatory for consumables)	Yes or No	On Page No. …….
12	For all the radiological equipment where there is need of getting NOC from AERB for its operationalization, then bidders have to arrange NOC from AERB by their own effort. RIMS will provide official support to the bidders in signing the required documents for getting NOC. All the bidders have to provide an undertaking regarding the same that – "We / I agree to handle all the responsibilities of AERB for getting NOC for operationalization of the quoted radiological equipment".	Yes or No	On Page No. …….

Note :

1. Sales tax form JGST-504 G / Road permit / Entry tax etc. of Govt. of Jharkhand will not be issued by authority. It will be responsibility of the bidders to arrange JGST form or any other documents related to sales tax / entry tax on their own.
2. If any of the above enclosures are of more than one page then in the page number columns write clearly on page no. ……..….. to page no. ……..
3. Without filling the compliance report the offer will be rejected directly at the time of technical evaluation.

Certificate of Compliance

I Mr. / Mrs. / Miss ……. on behalf of M/s (Name of firm / company) ……..…… do hereby confirm that I have verified the above compliance report, it is duly filled. Our technical bid consists of total (No. of pages) …… (in words ……..……..……)

Signature of the Bidder
with date & seal of the firm / company

23. Please enclose photocopies of your complete registration certificate with DGS&D / NSIC ./ DGQA / GeM (if any) as applicable, which should be valid on the date of tender opening.

24. Price bid of technically acceptable offers would only be opened for which either the respective firm would be invited through telephone / fax or the same may be opened with display in the notice board in case telephone message can not be passed on.

25. The following information should be given in the offer by tenderers :-

    a. Complete configuration of the main equipments.

    b. Relevant (must) accessories should be supplied with the equipment, if it is required for running the complete system.

    c. Optional accessories, if any.

26. In case of late job completion / installation / completion of the full complete project from the stipulated time frame, the liquidated damage charges / panalties shall be incorporated / charged on the bidders as follows :-

    (i) @0.5% of the total contract value after 07 (seven days) from the stipulated date of job completion and subsequently 0.5% on every seven days (weekly) maximum upto 04 weeks.

    (ii) After 04 weeks @1% of the contract value on every 07 days and upto further 04 weeks (i.e. upto toal 08 weeks after stipulated date of job completion)

    (iii) After 08 weeks @2% of the contract value on every 07 days and upto further 04 weeks (i.e. upto total 12 weeks after stipulated date of job completion)

    (iv) After 12 weeks of security money and EMD will be forfeited by RIMS & the amount will be deposited in RIMS account & will be utilized for institute's development / treatment of patients. The same panalties will be incorporated during warranty as well as CMC period.

27. Guarantee For Equipments : All quotees firms shall confirm guarantee of the complete equipments as well as for the turnkey works done by the bidder under this tender for 5 years of trouble free working from real date of handover, installation & functioning. During warranty as well as CMC period they will undertake repairs if needed within 07 days of intimation. Failing which penalty will be implemented as above. The bidder shall also indicate in their technical bids, how many precautionary physical check-up would be carried out by them during guarantee period

28. The successful tenderer shall have to submit security deposit equal to 10% of the value of the contract in form of Bank guarantee pledged to Director, RIMS, Ranchi. The bank buarantee shall ve valid for minimum period of 68 months.

29. The tenderers shall give a clear and guaranteed delivery period for completion of supply & installation and functioning of the complete system in their bid and they have to maintain the time frame.

30. Tenderers are required to answer all the question mentioned in the schedule & should return the same duly signed and filled along with form "A"

31. The tendering firms shall note that the supplies will be made in accordance with the specification mentioned in the tender.

32. Nevertheless, the purchaser shall be liable for price variation after final approval by purchase committee.

33. The tenderer has to mention clearly the quality, specification, names of companies for consumables like films & others to be used in the machines for optimum quality results. The tenderer has to assure in written about the local availability of consumables in their tender.

34. If the supplier, having been called upon by the purchaser to furnish security deposit (S.D.), failed to furnish the same within the period provided it shall be lawful for the purchaser to forfeit the E.M.D. and to cancel the contract.

35. The purchaser shall be entitled and it shall be lawful on his part to forfeit the amount of security deposit in whole or in part in the event of any default, failure or neglect on the part of the supplier in the fulfillment of performance in all respect of the contract under references or any other contract with the purchaser or any part thereof to the satisfaction of the purchaser.

36. The security deposit shall remain in full force and effect during the period that would be taken for satisfactory performance and fullfitment of in all respects of the contract i.e. since final acceptance of the goods/equipments or any other by the consignee and be valid upto guarantee period of the equipments to be purchased.

37. After complete installation of the equipment the supplier shall inform the technical committee or the concerned authority in writing for inspection & functioning of the equipments. If the inspecting officer finds that pre-inspection of the consignment is not as required then the consignment is liable for rejection.

38. Contractor / Seller hereby declare that the goods / stores / articles sold / supplied / installed to the purchaser under this contract shall be of the best quality and workmanship and new in all respects and shall be strictly in accordance with the specification & particulars mentioned in the contract.

The contractor / seller hereby guarantees that the said goods / articles would continue to confirm to the description and quality aforesaid for a period of Five years from the date of final installation.

a. Warranty to the effect that before joining out of production for the spare parts they will give in adequate advance notice to the purchaser of the equipment so that the later may undertake the balance of the life time requirements.

b. Warranty to the effect that they will make available the blue prints of drawings of the spares if & when required in connection with the main equipment.

39. The following clauses are required to be confirmed :-

a. Free routine servicing (at least 3 visits of their engineers at site in one year) will be carried out by the firm till guarantee period as well as during CMC period.

b. The firms will make available full engineer support package (ESP) including essential maintenance and recommended spares for maintenance of the equipment for further 05 years after the guarantee period.

c. The following set of documents in respect of the equipments are also required to be supplied by the firm :-

	Literature	**Distributions**	**Quantity**
(i)	Operation instructions	With each equipment	2 sets each
(ii)	Wiring diagram	Inspecting authority (Concerned authority)	2 sets
(iii)	Maintenance service manual	Inspecting authority	2 sets
(iv)	Spare parts lists indicating cost	(Concerned authority)	2 sets

d. The tenderers should quote the latest models. Quotations for out dated models of equipments will not be entertained.

40. Payment terms as follows :

A) 100 % after job completion.

B) No advance shall be payable to any bidder in normal cases. In emergency, after demand from the supplier party/parties for any releaf in any of the above terms of payments, the matter will be put infront of RIMS purchase committee for decision and then the decision of purchase committee will be kept infront of RIMS governing body for final decision.

Sd/-
Director
Rajendra Institute of Medical Sciences,
Ranchi

Signature of Tenderer
Name (in block letters) : _____
Capacity in which tenderer is signed : _____
Address in full : _____
Dated : _____ Seal _____

BOQ FOR
DEPARTMENT OF RADIOLOGY
LIST OF EQUIPMENTS & SPECIFICATIONS

1. **MRI 3 TESLA**
2. **CT SCAN 256 SLICE**
3. **ROBOTIC BIOPSY & TUMOR ABLATION**
4. **CR SYSTEM**
5. **ENDOSCOPE LIQUID STERILIZER**
6. **USG SIMULATOR FULLY LOADED**
7. **MAMOGRAPHY SYSTEM**

REQUIRED SPECIFICATIONS			
Sl. No.	Item Description & required specification	Bidder's offered make / model / specifications	Remarks or extra advantages of the offered model.
1	**3.0TESLA MRI SCANNER**		
	1. MAGNET A. 3.0T active shielded super conductive magnet should be short and non claustrophobic. B. It should have at least 70 cm patient bore with flared opening with Multi –transmit /Multi-drive /True form or equivalent C. Magnet length should be less than 200cm. D. Best homogenesity possible should be given. Specific homogenecity in VRMS at 10cm ,20cm ,30cm & 40cm DSV and at max FOV achievable with the quoted scanner. Homogeneity of magnet should be less than 3.5 ppm over 45 cm DSV.(Guaranteed homogeneity) Homogeneity should be maintained in large FOV, fat saturation and applications like cardiac, functional MRI, diffusion tensor imaging and spectroscopy. System with the highest homogeneity to be quoted E. The magnet should be well ventilated and illuminated with built in 2 way intercom for communication with patient. F. Cryogen vessel to be of Helium only with appropriate super thermal shielding and refrigeration facility for minimum Helium boils off . It should have a built in cryo-cooler such that helium consumption does not exceed 0.05 lit/ hour. G. There should be a Helium level monitoring equipment in the magnet and facility for appropriate quick shutdown of the magnet in the event of emergency H. Active shielding/Fringe field- quote values for 5 Gauss and 1 Gauss line External shielding-external interference shield		

	(sufficient to house the magnet, anesthesia and physiological monitors) should be provide **2. Magnet cooling system** A. - specify the boil off rate -Devices for helium level monitoring in the magnet should be supplied. B. High performance, highly stable shim system with global and localized automated shimming for high homogeneity magnetic field for imaging and spectroscopy. (3D shimming for volume imaging and CSI). C. Auto shim should be available to shim the magnet with patient in position. It should take minimum time to shim the magnet with patient in position (specify the time). **3. GRADIENT SYSTEM** A. Actively shielded Gradient system in all x y & z planes. B. The gradient should be actively shielded with each axis having independently a slew rate of at least 200 T/m/s and peak amplitude of 44mT/m,(higher slew rate and peak amplitude will be preferred). These true slew rates should be available in each axis independently, for overall better duty cycle performance of the gradient. C. The system should have efficient and adequate Eddy current compensation D. Effective cooling system for gradient coil and power supply **4. RF SYSTEM** A fully digital RF system capable of transmitting power of at least 25 kW or more with **(dual)** RF power amplifier. System should be capable of multi transmit with multi amplifier driving/ Multi-drive/true shape for better. Specify transmitter frequency range (10-86 MHz), it **should have latest software as standard.** B. Optical /digital RF receiver system with /high efficient RF receiver system /or its equivalent located on the magnet inside the shielded scan room . It should also have at least 32 independent RF receiver channels with each having bandwidth of 1 MHz or more along with necessary hardware to support quadrature ICP array/Matrix coils. The highest receiver channels available / mentioned in the product catalogue with the vendor should be quoted. The system should have necessary hardware to support quadrature phased array & flex coils. C. It should support Parallel acquisition techniques		

	with a factor of 12 or more. D. Should allow remote selection of coils and / or coil elements E. SAR limits should be as per FDA guidelines for all protocols, including neuro and abdominal imaging. **5. PATIENT TABLE** The table should be fully motorized with computer controlled table movements in: vertical and horizontal directions. Position accuracy should be +/- 1.0 mm or better. Specify the patient load capacity. B. A CCTV system with LCD display to observe the patient should be provided: Moving table angiography should be possible C. There should be a hand held or auto alarm for patients. D. Emergency manual traction of the patient from the table should be possible. E. Table Technology – Bolus chasing with the automatic/continuous moving table should be offered and should be available with fluoro triggered MR angiography for manual and fast switchover in less than 1 sec for CE-MRA. Latest table technology available with the vendor should be quoted. **6. PATIENT MONITERING** Patient monitoring devices for ECG ,respiratory ,pulse rate ,oxygen saturation ,at the console etc Remote display of gatting signals on magnet & at console . **7. PATIENT COMFORT FEATURES** Two way patient communication with head phone ,microphone & necessary accessories Patient alarm Lighting Music system (complete) MR compatible patient trolley (to transfer patient to the magnet table) MR compatible wheel chairs-2no. Closed circuit TV & CCD video camera for patient monitoring Provide other standard patient comfort devices ,with quoted sytem (please specify) **8. COMPUTER SYSTEM /IMAGE PROCESSOR/ OPERATOR CONSOLE** A. The main Host computer should have a 19 inches or more high resolution LCD TFT or LED color monitor with 1024 x 1024 matrix display B. The system should have image storage capacity of 100 GB for at least 200,000 images in 256x256 matrix. C. Additional storage of 25 terabytes to be offered. It should be possible to transfer the images from this		

	storage to main console or workstations D. The reconstruction speed should be at least 10,000 images per sec or more for full FOV 256 matrix. E. The main console should have facility for music system for patient in the magnet room. The system should have DVD/CD/flash drive archiving facility. Supply 5000 DVDs along with the system. The system should be provided with auto DVD writer. It should be possible to record multiple cases on the DVD F. Two way intercom system for patient communication. Patient monitoring devices for ECG, respiratory rate, pulse rate, O2 saturation at console. G. MRI System should be enabled and networked to RIS / HIS **9. MEASUREMENT SYSTEM** A. Largest Field of View should be at least 45 cm in all three axis. Higher FOV will be preferred B. The measurement matrix should be from 128x128 to 1024x1024. C. Minimum 2D slice thickness mm should be equal to or less than 0.5mm D. Minimum 3D slice thickness mm should be equal to or less than 0.1mm **10. COIL SYSTEM** A. The main body coil integrated to the magnet must be Quadrature/CP. In addition to this following coils should be quoted B. Standard Head coil (15 channel or more) C.. Head coil (32 channels or more) for EPI/DTI and fMRI applications compatible with fMRI projection device quoted with the system. D. Neuro-vascular Coil with 20 or more channels or Head/Neck Coil combined, capable of high resolution neuro-vascular imaging or combination of head and neck coli for similar coverage. E. Spine Array/Matrix Coils for thoracic and lumbar spine imaging with at least 32 channels acquisition per exam F. Body Array/Matrix coil with at least 45 cm z axis coverage for imaging of abdomen, with at least 32 channel Acquisition for body part angiograms and heart. In case one coil cannot provide this coverage then multiple coils should be offered. (The best available body coil with the vendor must be supplied). G. Suitable surface Coil for Peripheral Angiography application of at least 32 **Channel with coverage of 80 cm or more.** H. Dedicated Knee Coils at least 12 Channels or more. I. Flex Coil large		

	J. Small flex coil 8 channel or more for pediatric applications and for neonatal head and neck imaging. K. Cardiac Coil/suitable/coil combination, 32 channels or more for dedicated cardiac work. L. Suitable coil for carotid plaque imaging should be quoted as standard M. Total number f coils 10 (ten) excluding the main body coil integrated to the magnet. N. The coil system should permit coverage of 200 cm. O. A caddy to be provided for storage of coils. P. Dedicated Breast coil -8channels or more Q. Dedicated Shoulder coil R. Dedicated coil for Inner ear & orbit . S. Dedicated wrist coil (8 channels or more) T. Endocavitary coil for prostate & uterus evaluation—(Quantity 10) The system should continuously monitor the RF coils used during scanning to detect failure modes. RF coils should not require either set up time or coil tuning; Multi coil connection for up to 2 or more coils simultaneous scanning without patient repositioning i.e. like **TIM4G**/GEM/ **FLEX** stream coil combination should be quoted as standard **The supplier should quote Coils or their combinations exclusively for 10 applications, the number of coils should be thus mentioned as independent and not be having overlapping applications.** **Computer Control System** **-The vendor should supply the latest computer system along with the MR system to handle all the latest applications available on the MR platform.** **- During warranty period any hardware updates that are launched globally should be supplies and installed.** **Host Computer and array processors** **Latest state of the art computer system with suffient RAM (8GB or more) and computational speed to match the single short Echo Planar Imaging (EPI), interactive angiogram , multiplanar three dimentional (3D) reconstruction , surface rendering and dynamic imaging, Vascular imaging/ angiography, and adequate storage(1TB) for images and other applications.** **11. Application Package**		

	Data acquisition: 1. The system should be capable of 2D and 3D acquisitions in conventional, fast and ultrafast spin echo and gradient echo modes so that real-time online images can be observed if needed. All the sequences that are available with the vendor at the time of delivery should be provided as per their manual. 2. 2D multi-slice imaging should be possible in all planes (axial, sagittal, coronal, oblique and double oblique). 3. Up to 1024 x 1024 matrix acquisitions preferred for all applications 4. Half Fourier or other techniques to reduce scan acquisition time while maintaining adequate SNR. 5. 3D volume, multiple contiguous slabs, multiple interleaved and multiple overlapping slabs. 6. Slice thickness in 2D and partition in 3D to be freely selectable. 7. Dynamic acquisition (serial imaging) with capability to initiate scan sequences either from the magnet panel or from the console. 8. Dynamic acquisition: number of repeat scans with delay time either identical time interval or selectable. 9. Auto slice positioning from the localizer images 10. Maximum-off center positioning both anterior-posterior and lateral direction and should be selectable. 11. Gating: physiological signals like ECG, pulse, respiratory 12. External signal triggering (interface for triggering input pulse from external source). The provision should be available at the console also (for fMRI, EEG, etc) 13. Simultaneous acquisition, processing and display of image data in 2D multi-slice mode. 14. Selection of voxels from oblique slices should be possible while doing spectroscopy. 15. Artifact reduction/ imaging enhancement/ image filtering/ image subtraction/ addition/ multiplication/ division techniques: 16. Flow: 1st and 2nd order flow artifact compensation 17. Presentation slabs: a number of relocatable saturation bands to be placed either inside or outside the region of interest 18. Graphic prescription 19. Fat saturation techniques: frequency selective RF pulses to suppress fat signals in the measured image FOV. ROI selective (regional) fat suppression should also be given.		

	20. Magnetization transfer saturation: Off resonance RF pulses to suppress signals from stationary tissue in FOV 21. Phase contrast capability in 2D and 3D mode: Image intensity correction 22. Breath hold acquisition 23. EPI mode 24. DTI with MDDW or equivalent with a minimum of **12 and selectable upto 32 directions encoding.** 25. Data acquisition in all three standard planes (axial, sagittal and coronal) and oblique and double oblique planes or more oblique planes. 26. Higher matrix acquisition capability in single shot EPI. Acquisition time, TR, TE and slice thickness should be clearly mentioned and supported by data sheet reference. 27. The vendor should offer multi coil acquisition in order to optimize throughput increase and increased effective FOV. Individual acquisition elements of every coil should be mentioned. **MPR** 1 . Multi-planar reconstruction (MPR) in any arbitrary plane including curved planes with freely selectable slice thickness and slice increments 2. Surface Reconstruction and evaluation on reconstructed images with minimum time. 3.MIP in displaying in cine mode 2D and 3D mode, targeted /segmented MIP in any orthogonal axis with minimum processing time and capable of displaying in cine mode. **ADC, PERFUSION,** 1. Evaluation and displaying of diffusion images, ADC map, fMRI in reference of EPI optimized sequence. 2 Perfusion image evaluation with time intensity graph and other statistical parameters 3. Evaluation packages for calculating rCBV, rCBF, MTT, perfusion map , corrected CBV calculation , Fusion of perfusion map with Contrast enhanced 3D T1 images etc. Mention the packages /software offered with brochure 4. Flow quantification and evaluation for vascular (high & low) CSF, bladder outlet and cine display. **BOLD ANALYSIS.** 1. Evaluation of functional images of brain with appropriate statistical algorithms, color display and overlay on base anatomical images. **2.** Software for evaluation of functional mapping (BOLD EVALUATION) and neuro-metabolite mapping.		

	VBM **1.** Voxel-based morphometry for segmentation and quantification **TRACTOGRAPHY** **1.** Post-processing packages for DTI and Tractography, estimation of ADC, FA(Lamda, parallel, perpendicular separately and combined) , fibre tracking , fibre statistics and display of fibre tracts on anatomical images(s). ***Co-Registration .*** ***1.*** Superimposition on Neuro tractography geometry and tensor diffusion field on both functional BOLD mapping and neurometabolite (CSI) mapping. ***Image statistics.*** 1. Measurements of distance , area, volume, angle, mean, SD, image addition , subtraction , multiplication , division , interpolation, 2. Image filtering and image fusion software. 3. Software for co-registering MRI/fMRI/ MRS/Metabolite mapping with images from CT,PET, and SPECT. ***4.*** Evaluation features like zoom, rotation, scroll roaming, image synthesis, multi-point T1 and T2 calculation (more than 8) window stretching , text dialogues graphics, sorting, searching , archiving ,recalling etc. **SPECTROSCOPY** 1. Full post –processing for single –voxel MRS,CSI(multi-voxel MRS) , metabolite mapping with color coding (metabolic images). 2. Post processing should include FFT, base line correction , curve optimization , automatic phase correction , metabolite imaging, spectral mapping, magnetic resonance spectroscopic imaging(molecular imaging) with bnaming and peak integral values for all in vivo metabolites. **FUNCTIONAL MRI PROCESSING AND POST – PROCESSING**. 1. Functional imaging with package for BOLD imaging and processing package(capable of real-time processing and display of color overlay (in real time) using 32-channel Head coil being supplied with system. 2 Complete fMRI solution including audio-visual projection (3D capable) system , with headphones		

	with grey good noise suppression (more than 30 db) (Preferable to have LED/LCD monitor for projection) 3 Binocular eye tracker cameras, integrated with the visual system(preferable to have separate wearable eye-tracker cameras) 4 The audio-video projection system should have the capability to project 3D images /movies to the subject, and should be compatible with 32-channel head coil, and should all attachments that may be required for complete integration. 5 The system should be integrated with stimulus presentation /paradigm generator software, along with permanent license (like Superlab, eprime, Presentation, etc), which is capable of presenting audio-visual picture , audio, video (multiple formats) 6 The paradigm generator should be synchronized with the scanner(for starting along with measurements) 7 Integration (and Provision near the console) for external trigger (of the sequence) for synchronizing fMRI acquisition with paradigm. 8 Provision for serial ports and DB15 ports in the penetration panel for routing SVGA/EEG connections(one each for) 9 FMRI console should have all functions to develop and integrate the paradigm, to deliver the paradigm and also, to monitor the task being presented. The Volume control option should be available with the operator (at a convenient place at the console) 10 Post –processing workstation /server with post-processing software and hardware associated. with licenses for processing the BOLD data(with required licensed operating platform) 11 The system should have integrated MR compatible binocular eye –tracker(binocular), along with eye –tracking software at the console(on separate PC/Laptop) 12 The entire fMRI hardware package should bVivo, M/s. Philips, Nordic Neurolab, Noraway, Resonance Technology Inc. USA, or better). 13. Brain voyager post –processing software (along with permanent license) **a) Neuro Applications** Functional Imaging with package for BOLD Imaging and spectroscopic imaging and processing package with paradigm generator (non-goggle based) with large high resolution monitor that can be moved to any part of the exam room. It should be fully integrated with MR console for driving the paradigms. Should have console computer, E prime, microphone, fiber optic cables etc.		

	i.. Functional Imaging with package for BOLD Imaging and spectroscopic imaging and processing package capable of real-time processing and display of color overlay (in real time) using 32-channel head coil being supplied with the system. ii. Complete fMRI solution including audio-visual projection system iii. The audio-video projection system should be compatible with offered head coil, and should include all attachments that may be required for complete integration iv. The system should be integrated with stimulus presentation/ paradigm generator along with licensed software (like superlab, sprime, presentation, etc.) which is capable of presenting audio-visual, audio, video (multiple formats), etc v. The paradigm presentation should be synchronize with the scanner (for starting and ending along with measurements) vi. Integration and provision near the console for external trigger (of the sequence) for synchronizing fMRI acquisition with paradigm. vii. Provision of serial ports and in the penetration panel for routing SVGA/EEG connections (one each for customer use) fMRI console should have all relevant functions to develop and integrate the paradigm to deliver the paradigm and also to monitor the task being presented. The volume control option should also be available with the operator (at a convenient place at the console). viii. Post-processing work station / server with post-processing software and hardware associated, with licenses for processing the BOLD data (with required licensed operating platform required like MATLAB, IDL, etc.) ix. The system should have the complete hardware & software for visual simulation with facility for generating all paradigms. 2. Arterial spin labelling- **3D/2D** 3. Perfusion imaging of brain with software for rBV, CBV etc analysis. 4. Susceptibility weighted imaging with phase information SWI/SWIp/ SWAN. 5. Multi Direction DTI with minimum of 32 directions (Complete package including DTI quantification and tractography software). **Prospective motion correction enabled software should be part of standard equipment like 3D PROMO/3D PACE/PMC**. Spinal tractography should also be possible. 6. T2 Relaxometry and volumetric analysis for Hippocampus.		

	7. 3D-T2 weighted Turbo Spin for volumetric acquisition reconstructed in any plane e.g. for lumbar spine and for nerve root analysis. 8. High resolution imaging for inner ear for visualization of the structures fine structures like cranial nerves . (Appropriate sequences like CISS etc other equivalent) Please specify sequences 3D sequences for internal auditory canal imaging. Dynamic imaging of pituitary using appropriate sequences 9. The system should have facility for flow quantification of CSF aqueduct, spinal canal, vessel flow. Both retrospective and prospective gating should be possible. 10. Whole spine imaging with fusion software. Whole spine T1,T2 ,IR sequence Whole neuro examination with automatic planning, scanning & post processing with single localizer positioning without changing the coils /repositioning . 11. Real time Brain Wave, Pre Acquisition / post processing or Inline BOLD or BOLD Specialist. 12. Sequences such as Double Inversion recovery for "Plaque Imaging' in Carotids to be provided. MR ventriculography, cisternography, myelography Diffusion /DTI Sequence package for diffuse including DTI (tractography) study in organs like brain ,kidney ,muscle ,heart ,spine ,breast Prostate etc .There should be capability of calculating ADC map (isotropic and anisotropic from the regular diffuse and tensor data.MR diffuse tensor imaging package with tractography. b) **Cardiac applications:** 1.. Complete Advanced Cardiac Applications: Full comprehensive cardiac sequences which includes MR cardiology package for evaluation of heart in long & short axis with black blood cardiac imaging Package for coronary artery imaging including sequences for motion compensation –prospective & retroprosopective gating etc EPI based sequences for stress perfusion MRI including ability to adjust the cardiac phases required increasing HR ECG gating, Morphology/wall motion; Cine perfusion imaging; Myocardial viability imaging; Arrhythmia rejection techniques, Advanced Cardiac Ventricular Measurement Analysis; Cine Cardiac Tagging Techniques; Coronary artery techniques; real time interactive imaging, 2D/3D fast field echo/balanced/steady state techniques. Myocardial		

	tagging, STIR for cardiac use, stress perfusion, CARDIAC MRS , 3D acquisition of whole heart in one breath hold.2D and 3D sequences enabled with delayed enhancement .3D sequence of cine (bright blood & dark blood options). Rapid acquisition of heart using acceleration techniques.3D whole heart sequence (with & without contrast for coronary imaging).Ability to acquire multiple arterial and venous phases on CEMRA .3D whole heart sequence (with &without contrast for coronary imaging) Quantitative flow analysis soft ware .4D TRAK /TRICK-XV/TWIST /Equivalent (with maximum FOV). Provision for timing /stopwatch (MR compatible) for timing drug infusion. 2. Coronary artery techniques, real time interactive imaging, 2D/3D fast field echo/balanced/steady state techniques and evaluation package on workstation. 3. T1, T2, **T2* imaging.** c) **Musculoskeletal:** 1. High resolution imaging for cartilage and musculoskeletal imaging. Parametric MAP be available. dGEMERIC or equivalent, radial imaging for menisci and labrum. 2. Whole body screening imaging studies for metastasis should be possible upto 200 cm without repositioning of the patient. 3. The system should have software package for evaluation of bone marrow. 4. Metal artifact reduction sequence – MAVRIC/MARS / WARP **d) Hepatobiliary and abdominal system.** 1. High resolution Abdominal and Liver imaging in breath hold and free breathing modes with respiratory triggered volume acquisitions with navigation and liver fat quantification software, and spectroscopy. 2. The system should have basic and advanced MRCP packages including free breathing and 3D techniques. Pancreatography 3. Liver FAT quantification software should be quoted as standard. 4. Please quote software for MR Elastography as Standard. 5 . Flow quantification in vessels & CSF, hepatobiliary system . 6. Fly through faciflity with flow analysis including display of various velocity values 7. Optimized breath hold sequences for abdominal studies including angiogram 8. Pulmonary 2D/3D MRA sequence ,including single		

	breath hold sequence 9. Single sequence for to acquire four different contrast (in phase ,out of phase water only ,fat only)The same technique should be used in other sequences ,for dynamic angiography /T1 quantities analyses 10. Radial /Spiral pulse sequences for ultrafast imaging 11. Suitable artifact /fat suppression technique to be incorporated in all sequences to have optimum image quality . 12. A sequence for differentiation of fluid & cartilage in ortho applications (sequence like DESS or equivalent) 13. Susceptibility artifact correction technique to be incorporated in all sequences to have optimum image quality SWI 1. Sequence for susceptibility imaging 2. Sequence for prostate & uterine imaging 15. Sequence for imaging of breast (including sagittal ,bilateral breast imaging in a single acquisition) e). **MOTION CORRECTION** 1. Sequence for in-line motion correction for uncooperative patients /children(with soft ware & acquisition sequence like 2. Sequence with ultra short TE 3. Sequence for nullifying CSF pulsations artifact 4. Sequences enabling prospective motion correction in quick time & real time during fMRI 5. Sequence employing arterial spine labeling (ASL)technique 6. Whole body imaging (using body coils & surface coils) 7. Whole body diffuse weighted imaging (using body coils & surface coils) 8. Automated fusion and composing for the above two (without any artifacts) 9. Volume acquisition for neuro applications. f). **Vascular Imaging** 1. MR angio Imaging Should have 2D/3D TOF, 2D/3D Phase contrast (with and without gating and magnetization transfer saturation), black blood angiography for cerebral, pulmonary, abdominal and peripheral vessels and TONE, CEMRA, Facilities for high temporal and high resolution 4D angio imaging for time resolved vascular imaging with imaging frame of 40 frames/sec or more. For peripheral moving table angiography should be offered covering hip to limbs to		

	be examined in one go with high resolution & high SNR. 2. Bolus chasing with automatic and manual triggering from fluoroscopy mode to 3D position mode with moving table facility for whole body application. Specify table movement. Inline subtraction should be available. 3. "Non contrast enhanced" peripheral angiography for arterial flow with Native/ Trance/inhance sequences. 4. Time resolved angiography with contrast kinetics like 4D TRACK/TWIST/ **TRICKS/TRACKS** 5. Fast acquisition and reconstruction approach like KT Blast/mSense &GRAPPA/ ARC & ASSET for phase contrast velocity mapping 6. Perfusion study in organ systems like kidney, brain, heart etc. quantification of rCBF/ rCBV, MTT, etc, with color maps. 7. Bolus tracking soft ware package 8. Sequence for breath hold angiography with contrast enhancement 9. Sequence for time resolved angiography with contrast kinetics 10. ECG triggered non contrast angiography 11. Contrast bolus tracking (including single shot whole body MRA, interactive & automatic tracking etc. g) **Diffusion Weighted Imaging** with at least b value of 10000 or more. 1. Whole body diffusion weighted imaging with background suppression. SPECIAL APPLICATION PACKAGES The Vendor must provide their specialized and optimized imaging sequences with post processing packages for 1. a) Neuro (Smart exam / ready brain / smart brain) b) Body c) Oncology d) Cardiac(detailed in (j)), e) Angio (including DSA approach , capturing arterial, capillary and venous phases in a single acquisition with a single bolus), f) Ortho and MSK, g) Liver(including 3D T1 Fatsat for dynamic liver imaging) h) Pediatric i) Breast j) Prostate Smart exam /Smart Brain/Ready Suite/equivalent technique should be quoted in all available imaging packages. Please list other applications available with the Vendor, which,		

	h) **Spectroscopy:** 1. The system should have the Hydrogen, Single Voxel spectroscopy, Multivoxel, Multislice & Multi-angle 2D, 3D Spectroscopy and Chemical Shift imaging in 2D / 3D. The complete processing / Post processing software including color metabolite maps should be available on main console and on all clients currently. Complete prostate, breast, liver spectroscopy hardware (eg VAPOR,CHESS ECT) with all post processing software. If separate coil are needed for carrying out MRS ,it should be provided . Sequence for phosphorus single voxel and multi voxel spectroscopy should be provided ,with all post processing soft ware. RF sequences for cardiac ,prostate ,breast ,liver musculoskeletal & brain (if there is any specilaised/ optimized sequence available ,the same should be offered)with all post processing soft ware . Water and lipid suppression in automated sequences i). Productivity improvement Techniques with availability of "Previous Scans" such as Smart Exam/ DOT engine for Brain, Ortho, Spine etc. to be provided as standard. Integrated exam planning should be possible. All filming, viewing and export options should be possible. ***12.*** **WORK STATION** Multimodality Client server Architecture-server with Four concurrent clients capable of rendering **20000** images at peak performance. Workstation hardware should be industry standards and should be the latest with the vendors, as per their globally launched product catalogue. Please quote separate licenses concurrently available for all Four clients for all the application quoted. A reputed Anti- Virus Solution as well as for all clients, workstations should be in place. The vendor should provide antivirus updated for five years and make sure of the updated antivirus every week (using automatic update with internet facility by the vendor). A. Both workstations should work concurrently with multimodality client server architecture-server. i)Basic and advance post processing software including MIP, MPR, surface reconstruction and volume rendering technique, image fusion, 3D evaluation in all Four clients concurrently. ii)Advanced post-processing offered applications including FMRI, perfusion quantification, advanced diffusion and DTI on all 4 clients concurrently. iii)Advanced cardiac evaluation(EF, Calculation, Wall		

	motions, analysis) including perfusion analysis, processing of 2D/3D CSI data, with color metabolite mapping, quantification of CSF flow data, vascular analysis package **on four clients** concurrently. The clients should display cardiac cine images in movie mode with rapid avi creation. iv)Image Fusion software : Image filtering and image fusion software for co-registering MRI/fMRI. Calculation of Diffusion of Diffusion/Perfusion Mismatch. Overlay of perfusion and diffusion maps on anatomic maps and DTI Software for fusion of MRI and DSA. Advanced spine application package for nerve root analysis. Whole Body image fusion (composing) v)Each Client to have at least 19 inch LCD TFT 2MB pixel color monitor, with hard disk of at least 20TB for at least 100,000 image storage in 256 matrix, and 40 GB RAM capacity. Total 4 client hardware and software to be provided. vi)Each of the client should enable printing in laser film camera and color printers vii)The PACS should be provided by the vendor for incorporating 4 individual viewing station within the department. viii)Archiving options: Best archiving options to be provided. Additional Archive Storage server of 20 TB which is scalable should be supplied. **SAFETY FEATURES** The System should have following safety features A. The magnet system should include an Emergency Ramp Down unit (ERDU) for fast reduction of the magnetic field with Ramp Down time below 3 minutes. B. The magnet should have quench bands that contain the fringe fields to a specified value in the event of a magnet quench C. Real time SAR calculation should be performed by software to ensure that RF power levels comply with regulatory guidelines and are displayed on each image D. The system shall have manual override of the motor drive for quick removal of the patients from the magnet bore E. Temperature sensor (built in) for magnet refrigeration efficiency must be provided **13. DOCUMENTATION** A. One dry chemistry camera with resolution of 500 dpi or more. It should be digital DICOM 3.0 compliant i. The camera must be able to process up to 100 films/hour (min.) depending on the size ii. The system must deliver its first film within 80 seconds from request		

	iii. The system must have contrast resolution of 16 bits/pixel or more iv. The system must have at least three online film sizes, and should be capable to print on any of the 8x10, 10x12, 11x14, 14x14, 14x17 sizes. v. The system must not involve any wet process and must give a dry film in single stage (without any users intervention) functionally vi. Start up time should be less than 10 minutes vii. Easy day light loading viii. The system should be freely configurable by the user, to use any of the above mentioned size B. The camera must be DICOM compatible. (Attach conformance statement.) Film sorting system. (reported and unreported) **14. UPS** A. The UPS system should be provided for complete MRI unit with Chiller and emergency lights and for all accessories mentioned in the tender documents with at least 30 minute back up, preferably 150 kVA or more (specify kVA). Genset of adequate wattage to support the ACs and chiller to be provide. An emergency door or hatch should be provided in RF cabin. **15. SUITABLE RF ENCLOSURE** A. RF Cabin: The system should be supplied with the imported RF cabin with RF room shielding, RF Door screen, and interiors for the same should be carried out suitably. **16. ACCESSORIES** A. Dual head MRI compatible pressure injector with i. Non- Ferrous, automatic syringe size detection ii. It should be capable of performing single dual phase contrast injections, provides saline flush delivery and allows timed contrast delivery. iii. It should be possible to observe progress of injection and view injection results. B. Water Chiller for Cold Head I Gradients C. Patient comfort accessories i.e. patient call button, two way communication, music system, head phones, non –magnetic I/V stand, restraint strap, comfort pads, knee support and positioning accessories to be supplied. MR Compatible pulse oximeter should be quoted as standard. D. Two non-ferromagnetic patient transfer trolleys and two wheel chairs of international make should be provided E. Coil storage cart/carts capable of storing all the coils		

	offered with the system should be provided F. MR compatible defibrillator and Anesthesia Machine. **Specification for MRI compatible Anaesthesia machine** 1.Power backup (batter) for anaesthesia ventilator and monitor more than /equal to 45 minutes 2. Incorporated with electrically controlled, electrically driven ventilator with fallowing features. a. Operating modes-Manual/spontaneous, volume controlled, pressure controlled, pressure support, synchronized volume controlled ventilation. b. Breathing frequency 4-60bpm. c. Max minute volume 25L/min. d. PEEP 0-2- cmH2o e. I:E ration- 4:1 to 1:4 f. Tidal Volume – 20 to 1400 ml in volume control. g. Trigger – 2 to 15 lit/min. 3. Integrated safety feature like oxygen ratio controller and alarm for oxygen failure. 4. Anaesthethic agent vaporizer – 2 position dragger mount , one for Halothane and one for Isoflurane. 5. Gas supply from supplementary with pin index system and MR compatible cylinders with traded connectors. Specification for MRI compatible Anaesthesia monitor. 1. Validated for use in MRI scanners up to 3T outside the magnetic field strength of 300 Gauss. 2. Active remote screen for viewing and controlling the monitor outside the MRI room. 3. Intuitive usability and user automatically when connected to main power. 4. Built in back up batteries charged automatically when connected to main power 5. Improved safety with measurements and alarms of magnetic field strength. Parameters. 1. Hemodynamic options developed specifically for the MRI environment to measure Three –leade ECg , Spo2, NIBP. 2. Airway gas measurements with aneathetic agents and patient spirometry available with compact airway options. Accessories 1. Specifically designed ECG and Spo2 accessories for use in MRI environment. 2. Standard accessories to be used in NIBP, IBP and		

	airway gas monitoring 3. Cart for easy positioning and mobility between care areas. 4. Ambu bag for neonate and child for 2-4 years,. 5. Peadiatric laryngoscope with blade. 6. One portable suction machine. F. Two hand held metal detector should also be supplied G. Two Closed circuit CCTV camera at the head side of the patient with viewing panel at the console MR compatible (minimum 2000 Gauss line) cardiac & physiological monitors (ECG ,NIBP,SPO2) for neonates /infants & adults (with all accessories for five years)(Med Rad /In vivo /better models) MR compatible anaesthesia machine (for peadiatric & adult use)with dual vaporize (for isoflurene ,halothane) and other accessories (minimum 1000 Gauss line)(phelone /leon better models . Provision for external trigger (of sequences) near the console Provision for serial ports & DB 15 ports in the penetration panel for routing SVGA/EEG connections(one each for) Two quantity :Non magnetic IV stand Two quantity :Digital patient weighing Scale (the range of 0-200kg) MR compatible storage carts & wall mounted cabinets Coil cabinets to be provided Network cable & other required materials for complete installation to be provided by the supplier **ANTI VIRUS s/w and Web updates** All the server & work stations in the net work (MRI console & additional work stations ,PACS work stations (fMRI work station etc) that is supplied by the vendor should be provided with antivirus soft ware (periodically updated)for 5 years The vendors should provide antivirus five years & make sure of the updated antivirus every wk(using automatic update with internet facility by the vendor) Vendor should ensure that all the above modalities include necessary connections ,image & work list send /receive ,image data storage, scheduling ,patient registration & synchronization functions as per DICOM standards for smooth & effective integration with RIS/PACS. **Radiology reporting software with e record keeping facility with updated antivirus .** Training: On site clinical training of 4 weeks to be provided. Training : Of two radiologists In reputed international centre for 2wks for cardiac, fMRI & recent advanced applications.		

	OTHER ACCESSORIES 1. Ten revolving chairs (Godrej make) with ergonomic support 2. Table for the MRI console, MRI additional console/ workstations 3. Necessary desk, chairs & rack for the PACS server & workstation to be provided by the supplier 4. All the necessary interconnecting interfaces , cables, modules and other hardware and software to fully integrate the system for full operational status 5. Uninterrupted power supply (UPS) with sufficient capacity (appropriate rating as required with minimum of 200KVA or more UPS) for 30minutes back up of the full load MR system and its accessories during patient MR imaging 6. PACS system should be connected to the UPS (if a separate UPS is required for this purpose , this should be provided) 7. Two (quantity) MR compatible oxygen cylinders (for the anaesthesia system) 8. Good quality air curtain at MRI entrance (for patient) to filter the dust and prevent the leakage 9. Cupboards for patients to keep metallic belongings , watch, wallet, purse etc. **OPTIONAL SEQUENCES PACKAGES** Any other special sequence that are available as a product (other than those mentioned in this section)should be offered as an option If any optimized package is not included in the main bid , but available with the vendor ,the same application packages should be quoted as Optional. Please list all available packages with the vendor . Please list of all applications packages that are available with the vendor, which are optional /premium/advanced/application suite/etc. If these are not listed in the tender, please quote the cost of each package separately (two –bid system) Any advanced organ specific imaging with automatic planning , scanning and post –processing application should be quoted Rapid acquisition of heart using acceleration techniques. **17. Warranty and CMC:** ii). Warranty: 60 months from date of satisfactory installation & handing over to the department. Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period.		

	Warranty shall cover all the turnkey work including 3T magnet ,chiller ,helium and cold head (repair and /or replacement) + labour + spares for the complete system which includes all the accessories supplied such as camera, UPS, Generator, AC etc with 24 hrs manpower for operations (including all consumables like batteries for UPS, etc) iii). Note any Liquid Helium due to quenching or due to any other causes during the warranty period shall be borne by the firm. **L POST GAURANTEE ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT (CMC)** i) The post -warranty (after 5 CMC should be comprehensive and should include magnet, chiller ,helium and cold head (repair and /or replacement) + labour + spares for the complete system which includes all the accessories supplied such as camera, UPS, Generator, AC etc with 24 hrs manpower for operations (including all consumables like batteries for UPS, etc) and maintenance for another 5 years .the vendor should provide the cost of manpower separately .the CMC should be quoted in Indian rupees. The price of post warranty 5 years shall be taken for price comparison. ii) The desired up-time during post-warranty CMC is 95% of 365 days (24 hr basis) along with the penalty clause that in case exceeds the 5 % limit, extension of the post warranty CMC period by the twice the excess down-time period. **M. MISCELLANEOUS** The model with the best and latest technical features available with vendor should be quoted in tender response with original printed data vendor sheets the system should incorporate the feature as per the 2016 RSNA standard/declaration. All product catalogues in original When the vendor data sheet disagree with the bid response, clarification should accompany in the form of letter/certificates from the principal in original. List of all installation of the system in the country. The compliance statement must be filled strictly under headings given in the tender. Each specification corroborated in the compliance statement must give the page number where it is listed in the original technical data sheets along soft copy. *2* **Patient queue management system with overhead display and announcement system.** **Fire management with safety alarm of whole department.**		

SITE PREPARATION WORK ON TURN KEY BASIS FOR 3.0T MRI

The system should be satisfactorily installed & handed over in working condition, with all necessary electrical, AC & civil work undertaken
By the vendor in consultation with user department. Some re –arrangement of the exiting place including relocation of staff place may have to be carried out .

CIVIL/ELECTRICAL/PUBLIC HEALTH/AIR CONDITIONING WORK ETC.

1. The bidder should inspect the area and submit the plan for complete installation on a turnkey basis. The lay out plan and detailed drawing has to be approved by the Institute authorities. The scope of work involved including complete rework of civil, electrical and air conditioning including fire fighting. Any existing unserviceable diagnostic equipments may be relocated / taken away as per the departmental considerations. It will be the responsibility of the tendering firm to ensure that the proposed MRI system site has been inspected and is adequate for the installation of the quoted model including the air conditioning system.
2. The tendering firms will provide fire detection system and alarm & in rooms (inMRI section) and where there is fire alarm. Fire fighting in the MRI system to be linked with the main fire detection system of the hospital as approved by the concerned sectional incharge.
3. In addition to this the supplier has to provide additional facilities in the proposed MRI i.e. a MRI toilet, a counter, waiting hall and a patient preparation room, evaluation room, store for spares, if space permits All drawing and the list of works along with complete specification for civil, public health, electrical, air conditioning must be spelt out and provided along with the tender and needs pre-approval.
4. All the necessary interconnecting interfaces ,cables ,modules and other hard ware & software to fully integrate the system for full operational status.
5. Installation & integration of the uninterrupted power supply.
6. Turnkey items ,UPS ,Generator & other local items have to be quoted in Indian rupees only.
7. Water/Air chiller should be of Good quality with performance.
8. For transportation of MRI machine, vendor will modify the transportation route on their own cost if required.

Furniture:

a) Reception counters with granite.
b) Revolving chairs in the control room and viewing

	area –4 Nos. c) 12 chairs patient waiting area – Three in one (metallic). d) Dark room counter/film processing station. e) Adequate number of cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. f) 1 office table & 4 office chairs (non-revolving). g) Drug trolleys 1 numbers for patient preparation area. h) MRI compatible patient trolleys with rubber foam mattress to be kept in the patient preparation room. i) Any other furniture item as per requirement. **GENERATOR:** 1. 24 hour back up DG set of adequate capacity shall be installed as a standby along with other site preparation jobs in a separate enclosure. The standby generator should be of adequate capacity in support electrical load of MRI including equipment and AC plant. . 2. The agency will remove the material (civil/electrical & air conditioning) from the site and will give credit to the Institute for the same including old air condition and generator.		
2.	256 SLICE C.T. SCANNER		
	**** The Model offered should be the latest High end model under current production, should be Slip Ring Technology. The detector should be of latest technology having nano panel equivalent of Elite/Stellar/Clarity detector technology. Refurbished-Gold Seal Units will not be accepted. The Offer should meet the Specifications as follows.** **PACS for radiology Department with VNA architecture for long term storage & retrieval of images .Collaborative plat form for video conferencing with clinicians on PACs system .Robotic CD writer for dictating report directly into PACs. Need PACS for at least 4 users simultaneously.** **1. Manufacturer :** **2. Type & Model:** **3. Country of Origin :** The system should be latest state of the art, independent 128 or more rows of detectors with acquisition of at least 256 slices per rotation capable of integrating with any PACS/HIS system. The system should be DICOM - ready with true isotropic volume acquisition and sub millimeter resolution. The model quoted should be, AERB Type approved, US FDA and European CE certified. The essential requirements of the system are as follows:-		

	a) Gantry: - Aperture: 70 cms or more. - FOV: 50 cms or more - 3-D laser lights for positioning. **b) X-Ray Generator:** - High Frequency type. - Power output: 120 kW or higher with single source - mA Range: 20-1000 mA (With incremental steps of 10 mA) - KV Range: 90-110 or more **c) X-Ray Tube:** - Tube Voltage: 100-110 kV or more - Anode Heat Storage Capacity of at least 8 MHU or direct cooling tube with - Peak Heat dissipation rate of Anode should be at least 1600 Khu/min **d) Patient Table:** - Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less - Metal free scan-able range of 150 cm or more - Floating table top with foot pedal/hand control for positioning. -carbon fiber table top -Facility of positioning aid in horizontal isocenteric positioning of the patient **e) Spiral Acquisition:** - Scan Time should be 0.3 sec or less for full 360 degree rotation. - Minimum slice thickness should be 0.625 mm or less. - Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.5 to 1.5 or more. Specify all possible pitch selections. -Single continuous spiral scan time should be at least 100sec or more. - Bolus Triggered or bolus chase spiral acquisition should be available. -ECG gating triggered - Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual. **Real time CE fluoroscopy** :at 6 to frames per second with 19'' color TFT /LCD monitor **f) Image Resolution:**		

	1. High contrast resolution should be at least 21 lp/cm for axial and spiral scan at 0% MTF with full FOV. 2. Low contrast resolution – 4.0mm @ 3% @ 27 mGy surface(CATPHAN phantom on 10 mm slice thickness.) **g) Data Acquisition System:** - Detector- Capable of acquiring 256 slices per 360 degree of rotation. - At least 128 rows of independent detectors are required with Z-axis coverage of 50mm or more. -Detector shall cover 40mm per rotation for standard & cardiac scan in 1:1 pitch - Solid state or rare earth detectors of latest technology of low dose and low noise like ELITE/STELLAR/ CLARITY free from repeated calibration. -Inbuilt pediatric protocols. Based on infant weight. **h) Image Reconstruction:** - High speed 20fps real time reconstruction with display matrix of 1024x1024 or more. - Reconstructed slice thickness should be sub-millimeter to 7mm freely selectable. - Latest iterative reconstruction technique to reduce noise and reduce radiation dose should be quoted as standard. The image reconstruction rate should be at least 16 images/sec with this reconstruction technique. - Scan field & reconstructed field specify **i) Operator Console:** - High resolution medical grade LCD color monitors of 19‖ or more. - Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation. - Raw Data storage with at least 1.5TB Hard disc having image storing capacity of 2,00,000 or more in 512x512 format. - Auto-voice capability with custom designed key board and mouse. - Archiving options: CD-R, DVD, should be available. 5000 rewritable DVDs should be provided. - Additional storage of 25 terabytes to be offered. It should be possible to transfer the images from this storage to main console or workstations **k) Workstation client server architecture (Please quote Four concurrent licenses for the applications given below)**		

	2. Two way data transfer between the operator console & the satellite workstation should be automatic and standard. 3. Post Processing Soft-wares i) Perfusion CT for whole brain ii) CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view. iii) Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps. iv) Advanced complete cardiac package with ECG gated studies (prospective & retroprospective tagging) 1-cornary Artery Imaging, 2-Coronary tree extraction 3-one touch volume rendering of whole heart 4 -Calcium Scoring , 5-Calcium & coronary angio reporting 6- Myocardial Viability software, 7-Cardiac functional analysis and advanced Vessel analysis including stenosis assessment, arrhythmia editing and reconstruction and diagnosis of patients with arrhythmia during acquisition must be possible , 8.Dynamic myocardial perfusion should be available For complete LV coverage of 8cm or more Facility for prospective and retrospective ECG gating, facility for automatic selection of rotation speed according to heart beat and step and shoot for low dose acquisition should be available. Temporal resolution of 70msec or less should be quoted as standard. v) Automatic bone Removal facility for rib cage and skull. vi) Dental CT. (vii) Auto Liver segmentation display software in different colours, volumetry and virtual surgical plane identification for a comprehensive analysis and quantification of clinical information. viii) Bone mineral densitometry soft ware. 5. Interactive & Automatic Cine display should be available. 6. Image Evaluation Tools i) Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms, ii)Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms. iii) Distance & angle measurement, freely selectable, positioning of co- ordinate system, grid and image annotation. **PLEASE NOTE THE WORK STATION SHOULD BE MADE BY THE MANUFACTURER OF THE CT SCANNER AND MUST BE**		

	CE AND US FDA APPROVED. **iv) Archiving options: Best archiving options to be provided. Additional Archive Storage server of 25 TB which is scalable should be supplied.** **l) Patient communication system:** 1. An integrated intercom and Patient Instruction System (API) should be provided. 2. Two closed circuit TV for patient monitoring. **m) Dry Imager:- 2 nos.** 1. Resolution: 16 bits/ 500 dpi or more with minimum two ports. 2. Support Multiple Film Sizes: one of which must be 17‖x14‖. 3. DICOM 3.0 Compatible. – attach conformance statement ***Laser color printer (Paper)** **-DICOM compliant** **-Resolution-at least 1200x1200dpi** **-more than 20ppm** **n)Defibrillator** **-Biphasic, latest model with auto and manual mode. Minimum 50 manual selection upto 200joules** **-The charging time of higher energy level should be less than 7seconds** **-Disposable defibrillator pads-10 Nos. with each machine should be provided** **-Should have external pacemaker facility.** **General anaesthesia machine with circle absorber, vaporizer for halothane & isoflurane and ventilator to provide** **o) System Configuration Accessories, spares and consumables:** - Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations Light weight -Radiation protection apparels including Aprons -5 Nos, Gonadal shields -5Nos, Thyroid shields - 5Nos, Lead goggles -5 nos , Lead gloves -5Nos ,collapsible wheel chair with rubberized swivel wheels Standard patient positioning accessories & restraining devices - 2 in number Medical illuminator (LED) with light regulator for viewing at least 4 films of 17''x14''size , 6 in number		

	- Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes back up. - Dual Head Pressure Injector with 200 syringes of 200 ml. - Software for Remote Diagnostics Service should be provided. - System must be PACS, HIS/RIS interface ready without any new hardware or software. **- A free comprehensive software update guarantee for entire life of scanner must be provided.** - **Real time CT Fluoroscopy** with at least 6 to 8 frames per second with dedicated 19" or more color LCD monitor. Facility table side controls and foot switch for biopsy to be quoted separately. **p) Phatoms to be provided for regular QA studies** **.** **q) Instructions to the vendors/suppliers:** All companies must give product data sheets confirming the specifications along with the tender. ***The compliance statement must be filled strictly under the heading given in the tender.*** Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered. Vendors are requested to see the site for installation of the CT. **As there is continuous development of technology latest model available with the manufacturer shall be offered in the tender.** **r) AERB site approval:** Vendors shall be responsible for getting AERB Site Plan approval prior to installation and licensing. **It is the responsibility of the bidders to visit the consignee site for assessing site requirements and readiness.** **The technical specifications given above are the minimum requirements. Higher specification will also be considered at the time of technical evaluation.** **s)Training: On site clinical training of 4 weeks to be provided.** **Training : Of two radiologists In reputed international centre for 2wks for cardiac & recent advanced applications** **t)Warranty :60 months from date of satisfactory installation & handing over to the department**		

	Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period **The warranty shall cover all the tunkey work including CT tube, camera, UPS, power injector & all consumables. Comprehensive maintenance contract for next five years including all the accessories, turn keywork, CT tube, air conditioning, camera, power injector & all consumables.** **u)Please attach a complete list of spares which will be provided with the equipment** **COMPUTER FOR REPORT GENERATION** **1. Radiology reporting management software for report generation and record keeping.** **2. Latest available CPU with 16GB RAM , 2TB hard disk , 19'' high resolution monitor & high resolution graphic card : 2 in no** **3. Laser printer with scanner –Black & white** **SITE PREPARATION WORK FOR MULTI SLICE CT SCANNER TO BE INSTALLED IN THE CT DEPARTMENT** **CIVIL / ELECTRICAL / PUBLIC HEALTH / AIR CONDITIONING WORK ETC** 1. The bidder should inspect the shaded area earmarked for the proposed CT scan and submit the plan for complete installation on a turnkey basis. The layout plan and the detailed drawing has to be approved by the Institute authorities. 2. The tendering firm should give a certificate that the proposed CT scan site has been inspected and is adequate for the installation of the quoted model including the air conditioning system. 3. The tendering firms will provide fire detection system and alarm system and fire fighting in the area to be linked with the main fire detection system of the hospital. 4. All drawing and the list of works along with complete specification for civil, public health, electrical, air conditioning must be spelt out and provided along with the tender. .5 For transportation of CT machine, vendor will modify the transportation route on their own cost if required.		

	Civil work 1. Preparation of control room, examination room, patient preparation room, computer/auxiliary devices room should be designed with proper lead protection as per AERB recommendations. 2. Whole area should have complete wall to wall vitrified non-slippery tile flooring and dado upto ceiling height ceiling, aluminum doors with proper lead protection as per AERB recommendations and with hydraulic door closers locking arrangements. 3. The aluminum glazed door of thickness 10 gauge with 20 micron anodizing and with 5.5 mm thick wired glass/12mm thick pre-laminated board for the main entrance doors. 4. Antistatic PVC flooring to be done after final installation of machine. **Electrical work and earthing:** 1. The firms shall be required to specify the total load requirements for the entire equipment's the air conditioning units, room lighting and for the accessories if any. 2. The electrical work will including wiring, different lights and main switch fittings. The special roof light will be required particularly in the equipments room which should have long life and should not be affected by frequent on and off. 3. The electrical work shall include the following a. Wiring – The wires shall be of copper of different capacity as per the load and should be renowned make like FINOLEX, POLYCAB b. Switches light and power points should be of modular type and of make MK/ North west. c. General lights- Mirror optical type 1x40w or 2x40w PHILPS / CROMPTON/ KESSELEC SCHREDER / WIPRO make d. The under ground cable supplying the electricity load should be of HAVELLS/ECKO and INCAB e. MCBs / ACBs/ MCCbs should be MDS/ SIEMENS/ABB f. Roof light – LED down lighter of PHILIPS / OSRAM/ WIPRO g. Main switchgears, fuse units should be L&T / SIEMENS / GE h. Telephone cables should be of FINOLEX & R.R cables i. Electrical load of the system to be added as per the tender / brand of the equipment. j. Complete earthing as per requirement of the system based on the total electrical load.		

Air conditioning

1. Whole area needs to be air conditioned. Use of fresh air system with recycling as required as per the size of the area and circulation efficiency. Ventilation is required in toilet
2. Environment specifications

a. Humidity range 40% to 60% relative humidity in all areas except equipment room which shall be as per requirement of the equipment
b. Temperature ranges 22+ / -2 in all areas except equipment room which shall be as per requirement of the equipment.
c. Details for the ducting diffuser, grills etc. to be supplied by vendor,
d. Air conditioning load: Air conditioning load for the data centre shall be as per design with air cool package units having stand by system of makes VOLTAS/ BLUE STAR/ CARRIER. However, the heat load calculation and maintaining temperature and humidity shall be the responsibility of the bidder.

Furniture

a. Revolving chairs with arm on castors - 4Nos.
b. Non-revolving chairs with arm - 6 No.
c. 16 chairs patient waiting area (metallic).
d. Cup board – 1 Nos.
e. Office Table - 1
g. Drug trolleys 1 numbers for patients preparation area
h. Patient trolleys with rubber foam mattress to be kept in the patient preparation room 12).
i. Any other furniture item as per requirement

Miscellaneous

1. One channel stereo musical system with inter room communicating system connecting the reception counter with other cabins of the complex
2. CCTV system should be provided connection the gantry room with the console room with additional CCTV in the entire CT complex area including installation as per requirement approved by HOD.
3. Thin view box (<1") three – in – one configuration – 2 nos.

GENERATOR:

1. 8 hour back up DG set of adequate capacity shall be installed as a standby along with other site preparation jobs in a separate enclosure. The standby generator should be of adequate capacity in support electrical load of CT including equipment.
2. The agency will remove the material (civil/electrical & air conditioning) from the site and will give credit to the Institute for the same including old air condition.

3	**ROBOTIC TOOL FOR CT GUIDED TUMOR ABLATION SYSTEM WITH INTEGRATED TREATMENT PLANNING SOLUTION**		
	Computerized Needle positioning guiding tool along with Radio Frequency Ablation system to provide integrated workflow solution under CT guidance to perform Tumour ablation from Planning to completion of Ablation. 1. System shall include a Robotic Positioning tool, controlled by the integrated treatment planning system for placement of Biospy or Ablation needles • 1.1 System should be able to work with DICOM Compliant CT and PET CT scanners. • 1.2 System should be able to support commonly available ablation techniques like RF, Microwave, Cryo, IRE etc. and preferably other percutaneous procedures like Biopsy, Pain management, Drainage etc. • 1.3 System should be able to support any Ablation device that is commercially available in India. • 1.4 System should have the facility to receive images and support procedure planning within and outside of procedure room. • 1.5 System should allow clinicians to fuse or register images from at least two series of CT Images. • 1.6 System should have commonly used tools like zoom, pan, measurement, window level adjustment etc. • 1.7 System should have a set of post processing tools like segmentation, image registration for visualization of tumour and other structures including multiple tumours. • 1.8 System should have tools to help clinicians identify vital structures like bone, vasculature and other critical organs that should be spared from needle and thermal injury during procedure. • 1.9 System should have facility to create a library of devices along with their characteristics like needle throw, exposure, ablation size etc. • 1.10 System should have a tool for trajectory planning of one or more needles on 2D and 3D volume rendered images including for multiple tumours. • 1.11 System should have a tool to overlay ablation zones of selected Needle on tumour volume both in 2D & 3D images and determine appropriate ablation device and parameters for adequate tumour coverage • 1.12 System should have a facility to alert the user during planning, for possible collision of a needle with another needle or with identified vital organs or potential Thermal injury to vital organs based on the Ablation volume data .		

	1.13 System should be able to generate the comprehensive ablation planning report. 1.14 System should have the capability of Image – Patient registration and assist clinicians to place needles accurately at the target as planned on the image without mandatory need for fluoroscopic exposure or any other external devices for feedback. 1.15 System should have tools to monitor breathing related movement and also to control patient movements during procedures. 1.16 System should support placement of multiple needles with single planning either for simultaneous Multi probe ablation or sequential ablation without collision during placement. 1.17 System should have a tool to register intra-procedural images to verify device placement with respect to plan. 1.18 System should have the ability to present segmented volumes of pre and post treated targets, taking into account intra procedural target movements with ability to Register/Fuse pre and post procedure images in 3D and 2D MPR views. 1.19 System should have a comprehensive reporting package with an ability to automatically document all key parameters and selected procedure images. 2 . Should include a Radio Frequency Ablation generator with following features 2.1 Frequency of the RF generator should be at least 450 KHz 2.2 Should support Multi-prong Electrode or similar technology and capable of ablating up to 5 cm in one sitting. 2.3 Should have real-time temperature monitoring at least at 5points. The temperature range should be 15-125 °C with steps of 1 ° C. 2.4 All Required standard RFA accessories should be supplied with the system. 3. The entire system mentioned above should be CE and USFDA certified . **Note:_Bidders shall furnish technical compliance statement for the model quoted , details of manufacturer including deviations if any. Technical catalogue /data sheet shall also be furnished in support of technical compliance statement without fail.**		

	Warranty : 60 months from date of satisfactory installation & handing over to the department. Licencing and registration to be done by the company. Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period **The warranty shall cover all the including machine, monitor, UPS , & all consumables .Comprenhensive maintenance contract for next five years including all the accessories , ,aircon**		
4	**COMPUTED RADIOGRAPHY (CR) SYSTEM**		
	The Computed Radiography (CR) system should have following essential features: **1. Image recording system (Cassettes and Imaging Plates):** The following size of cassette and imaging plate should be supply along with the unit. a) 14" X 17" – 6 Nos. b) 10" X 12" – 6 Nos. c) 8" X 10" – 6 Nos. **2. Image Reader/Digitizer** a) System must have capability to read following sizes of Cassettes 14x17 inch, 14x14 inch, 10x12 inch and 8x10 inch. b) System must achieve minimum 65 plates/hour or more for largest size of cassette. c) System must have scanning resolution of 6 pixels/ mm (minimum) or more for standard resolution. d) System must be standalone floor model. e) Gray scale resolution must be at least 12 bit or more. f) IP inside the cassette should be rigid or dual side reading capability. g) System should have 20 pixel reading option for mammography or Pediatric patient. h) System must be FDA approved for mammography application. **3. Workstation** a) System must be capable to support dual monitor configuration b) 19" or bigger size of Monitor should be LCD/LED. c) Monitor resolution must be at least 1280X1024 d) Image processing algorithms are based on multifrequency processing type e) Software automatically masks the area outside the collimation edges for better productivity. f) Manual adjustments of the masked area should be possible		

	g) System must be capable to connect to PACS through Dicom Store h) System must be capable to print to dry laser printers through Dicom Print i) System has the capability to connect to existing RIS/HIS system and communicate through HL7 protocol j) System must be capable of burning patient images on CD/DVD k) System must be capable of running a QA/QC test to verify performance l) A statistical report must be generated to track repeat exams, dose etc m) Images can be freely rotated n) System must be capable to export images to media such as USB, CD Rom etc o) System must be capable of importing images into the database from various media type such as USB sticks, CD rom etc p) System must make available Advanced measurement tools such as lengths, angles, cobb angles , Cardio Thoracic Area ,etc q) Patient list can be created either form the main workstation or from a web client remotely connected r) System can offer optional feature of a specific module to generate reports and store them on the same database along with images s) System should have Optional feature of Reports can be created either from the main workstation or from any web client remotely connected t) System must offers the capability to acquire images from modalities as CT, MR, US etc, review them and store them u) Images and reports can be distributed across web clients connected to the main workstation v) Minimum number of concurrent web clients supported should be 4 w) System must be able to print images through standard paper printers networked to the main workstation x) System offers the capability to crop images, zoom and print y) System allows to add patient picture to demographic screen z) Provided PC for Workstation/Consol must be from reputed brand like Dell, HP, IBM or similar reputed brand. **4. Dry Printer/Imager** a) Printer Should have 2 or 3 online supply trays. b) Printer/Imager must have dry technology and avoid use of any wet chemical for process film. c) Printer should have automatic image quality/density controlling system. d) Each tray of the printer must be capable to accommodate following international standard films sizes 8X10 inch,10X12 inch,11X14 inch and 14X17 inch without alteration to the tray.		

	e) Printing resolution must be standard 500 dpi/ppi or more for all type of DICOM image printing. f) Throughput should be 100 film/hour or more for 8"x10" size of film. g) Printer must have14-bit pixel depth architecture h) Printer must day light film loading technology. **5. Suitable online UPS with minimum 30 minutes battery backup.** **6. Warranty: 60 months from date of satisfactory installation & handing over to the department.** **Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured.** **In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period** **The warranty shall cover all the including CR machine, film reader and cassette, monitor, UPS & all consumables. Comprehensive maintenance contract for next five years including all the accessories, airconditioning & all consumables.**		
5	**Endoscope/ GI Sterilizer for immediate use**		
	The system is meant for terminal Sterile Processing of cleaned, immersible, and reusable critical and semi-critical, Heat sensitive medical devices in healthcare facilities. An intended system should be used with liquid sterilization process for Both surgical as well diagnostic equipments It should have following features - - It should be portable preferably on Wheels along with water treatment plant - It should use Peracetic Acid as Oxidative chemistry for sterilization of the scope - The system should be with Top Loading facility which intends to process minimum one number endoscope at a time in one cycle - During the cycle the temperature in the chamber should be in the range of 50- 56 Deg C - The system should have minimum exposure time of 10-15 min for active sterilization - Total cycle time should not be more than 35 min for any type of scope. - The system should have touch sensitive keyboard for operation, with indicator light for cycles - The system should have appropriate in built printer facility to take print outs of respective cycles - The system should have optional feature of bar code reader - There should be status button which shows status of the phase cycles - The system should have various tray to cover generic scopes, flexible scopes, Universal trays to cater various scopes - The system should work with single phase 230 V , 50 Hz		

	- There should be dedicated drain for a system - The system should have portable water purification assembly in stages with membrane size of 0.2- 0.3 Micron filter pore size - There should be dedicated sterilent cup per cycle. Consumable such as chemical indicator & biological indicator should be offered as an optional item - desired quantity 500 units each separate price for sterilent should be provided along with the price bid Along with the system 30 no of sterilent cups should be provided as standard. - The system should be FDA certified. Corresponding certificate t be attached along with technical bid - Minimum 3 certificates from endoscope manufacturers to be enclosed along with technical bid **Warranty: 60 months from date of satisfactory installation & handing over to the department.** **Licensing and registration to be done by the company.** Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period **Comprehensive maintenance contract for next five years including all the accessories & all consumables.**		
6.	**<u>Diagnostic Ultrasound Simulator</u>**		
	<u>Basic Equipments (Hardware):</u> • Mannequin • Computer – Including keyboard, mouse, cable and screen • 21" TFT monitor • Transducers: a) Phased ArrayTransthoracic Echocardiography (TTE) Probe b) Trans Esophageal Echocardiography (TEE) Probe c) Curvilinear Probe (For FAST, Abdomen, Pleural & Ob/GynModules) d) Transvaginal (TVS) probe **<u>Training Modules:</u>** • **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. • **Trans Esophageal Echocardiography – TEE** : System should have at least 30-40 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) 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. • **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. • **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. **Mannequin:** 1. Male Mannequin for Cardiac, Pleural, Abdomed/FAST Modules 2. Female Mannequin for Ob/Gyn Modules 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 **System should have the following features:** • M-Mode imaging and Color Doppler • 3D animated augmented reality feature shows ultrasound beam and target structures. • Biplane mode for cardiology • Spilt screen display with corresponding 2D image. • TEE probe insertion. • 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. • Should have task training of probe basic movement & orientation for the trainees. • Multimedia ICCU course on point of care ultrasound included with the simulator. • Should have Color Doppler in cardiac pathologies. • Mannequin should have ability to be placed in the tilted left lateral decubitus position. **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 **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 **<u>System must have following FAST Pathologies:</u>** • 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 **System must have following Emergency Ultrasound Pathologies:** • 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 the following features for Ob/Gyn Module:** • Features an 8-20 week fetus (1st& 2nd trimesters) with realistic fetal and maternal anatomy. • Ability to date a pregnancy, estimates the amount of amniotic fluid, and detects structural abnormalities (birth defects). • Ability to load pathologies in stealth mode to hide the name of the pathology from learners. • Augmented reality display includes interactive, animated 3D anatomical depiction of organs, structures and abnormalities. • High resolution, real-time ultrasound images that can be viewed simultaneously with 3D anatomical images in split screen mode. • Visual display of surrounding anatomical structures: fetus veins and arteries, mother's bladder, mother's bones, mother's intestine, umbilical cord, placenta, uterus and skin. • Ability to toggle on/off structures from the augmented reality display. • Ability to change the position of the fetus. • Ability to change the gender. • Target Cut Planes allow learners to visualize correct probe positioning. • Metrics to assess competency and for research purposes.		

	• Metrics, reports, images, and video captured may be exported to a USB storage device. **<u>System must have the following Pathologies:</u>** **8 Week Pathologies - Ultrasound can be done with the Curvilinear and Endovaginal Probes** 1. Normal Fetus 2. Bicornuate Uterus 3. Blighted Ovum 4. Cesarean Scar 5. Dermoid 6. Ectopic Pregnancy 7. Enlarged Corpus Luteum Cyst 8. Fetal Demise 9. Fetus Younger Than Expected 10. Intrauterine Device 11. Molar Pregnancy 12. Subchorionic Hematoma 13. Twins Dichorionic-Diamniotic 14. Twins Monochorionic-Diamniotic 15. Twins Monochorionic-Monoamniotic **12 Week Pathologies - Ultrasound can be done with the Curvilinear and Endovaginal Probes** 16. Amniotic Band Syndrome 17. Anencephaly 18. Cephalocele 1 19. Cephalocele 2 20. Megacystis 21. Normal Fetus 22. Nuchal Translucency 2.8mm 23. Nuchal Translucency 3.2mm 24. Nuchal Translucency 4.7mm 25. Nuchal Translucency 5.5mm Hygroma 26. Nuchal Translucency 9.5mm Hygroma 27. Omphalocele **20 Week Pathologies - Ultrasound should only be done with the Curvilinear Probe** 28. Cleft Lip 29. Gastroschisis 30. Normal - 20 weeks 31. Unilateral Ventriculomegaly 32. Bilateral Club Foot 33. Choroid Plexus Cyst – Small 34. Choroid Plexus Cyst – Large 35. Cleft Lip and Palate 36. Cleft Palate 37. Cloacal Bladder Extrophy 38. Dandy Walker Syndrome 39. Esophageal Atresia 40. Fetal Growth Retardation – Shortened Femurs 41. Left Renal Agenesis 42. Mega-Cisterna Magna 43. Multicystic Renal Dysplasia		

	44. Nasal Bone Absence 45. Nasal Hypoplasia 46. Oligohydramnios 47. Omphalocele 48. Polyhydramnios 49. Renal Pelvis Dilation 50. Right Renal Agenesis 51. Unilateral Club Foot **Realistic Echo Environment:** • Transducer • Electronic calipers • Area measurements • Gain and contrast settings • Depth of field adjustment **Downloadable Software Upgrades:** • Capable of downloading automatic software updated from the central server. **General:** • Should have sufficient spares bank locally to maintain the up time. • Should have dedicated company's Customer Support Representative in India to handle break down of the system. **(A) Ultrasound Based Interventional Training Models** **Hepatobiliary drainage and biliary stenting training model.** **Renal stone retrieval / extraction by PCNL training model.** **Ultrasound Central Line Training Model** • Model should have ultra-durable tissue and extremely realistic in ultrasound imaging characteristics feels and cannulates like real human tissue • Should be realistic and ultra-durable central venous access ultrasound training model excellent for training clinicians in the psychomotor skills associated with ultrasound guided central venous access procedures • Should have ultra-durable self-healing tissue is extremely realistic in ultrasound imaging characteristics and feels like real human tissue • Self-healing tissue shall withstand tremendous use and will save you money by dramatically reducing the necessity for purchasing replacement parts • Should contain anatomically correct vascular anatomy of the right upper thorax and neck including the internal jugular vein, brachiocephalic vein, subclavian vein, axillary vein, carotid artery, subclavian artery, and axillary artery, as well as anatomical landmarks		

	including the clavicle, the two heads of the sternocleidomastoid muscle, and the sternal notch • Positive fluid flow in 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 users to easily verify successful venous access procedures • Tissues should match the acoustic characteristics of real human tissue so when you use your ultrasound system on our training models, you experience the same quality you expect from imaging patients in a clinical environment • Arterial pulsation are simulated using a provided integrated automated pumping system • Soft pricking part should be good for at least 1000 pricks before replacement. **Femoral Vascular Access Lower Torso Ultrasound Model with DVT Option** • Realistic and ultra-durable femoral vascular access ultrasound training model excellent for training clinicians in the psychomotor skills associated with ultrasound guided procedures • Superb ultrasound imaging characteristics • Ultra-durable self-healing tissue is extremely realistic in ultrasound imaging characteristics and feels like real human tissue • Self-healing tissue will withstand tremendous use and will save you money by dramatically reducing the necessity for purchasing replacement parts • Contains anatomically correct vascular anatomy of the right lower torso including the femoral artery and vein • Anatomical landmarks of the lower torso • Utilize traditional anatomical landmarks for blind insertion techniques, or utilize ultrasound to obtain images of anatomical structures • Accommodates full threading of guidewires and catheters • Venous and arterial fluids that are removed during central catheter insertions training are easily refilled using quick fill ports • Arterial pulsation are simulated using a provided integrated automated pumping system • Positive fluid flow in the vessels provides users with immediate feedback when vessels are accessed • Simulated blood fluids in the arterial vessels differ from the venous system allowing for users to easily verify successful venous access procedures		

	• Tissues match the acoustic characteristics of real human tissue so when you use your ultrasound system on our training models, you experience the same quality you expect from imaging patients in a clinical environment • Deep Vein Thrombosis (DVT) option available • Performs well using any ultrasound imaging system • Soft pricking part should be good for at least 1000 pricks before replacement. **PICC with IV and Arterial Line Vascular Access Ultrasound Trainer** • Should be able to train ultrasound guided PICC placement, ultrasound guided IV placement and ultrasound guided arterial line placement • Should have correct catheter placement with ultrasound or X-ray • Should have ultra-durable tissue which is self-healing to prevent leaks and able to last over 1,000 needle cannulations • Designed to match the acoustic properties of human tissue; will work with any ultrasound system • Should have Vascular Anatomy that Includes: o Cephalic Vein o Radial Vein o Basilic Vein o Ulnar Vein o Medial Cubital Vein o Brachial Artery o Radial Artery o Ulnar Artery o Superior Vena Cava & Subclavian Vein (To verify catheter placement) • Should have easy to refill simulated vessels • Pulsating arteries via included hand-bulb • Should have user replaceable tissue inserts **Lumbar Puncture and Spinal Epidural** • Model should be an excellent training platform for lumbar puncture, lumbar epidural, thoracic epidural, and cervical epidural procedures. • Should be excellent for blind insertion techniques or using ultrasound for guided lumbar puncture and spinal epidural procedures • Superb for needle access as well as the placement of catheters • Can be positioned in the upright or lateral decubitus position allowing users to accurately position the model for appropriate training scenarios		

	• External landmarks as the iliac crests can be palpated in the model to initially orient the user to the proper access points • Palpation of the spinous processes provides additional landmarks • The accessory obese spinal insert** should provide more adipose tissue disallowing the palpation of the spinal processes • Each spine tissue module should be superb in its realism and contains the appropriate spinal segment, skin tissue, ligamentum flavum, epidural space, dura, subarachnoid membrane, and subarachnoid space containing cerebral spinal fluid • Should be able to utilize for full procedural training including injecting local anaesthetics, introduce the needle to the epidural space and/or subarachnoid space, thread catheters, infuse simulated anaesthetics, and obtain manometer measurements • The cerebral spinal fluid pressures can be easily increased in order to simulate pathological scenarios during lumbar puncture procedures • Ultrasound can be used for identification of the optimal insertion points, angle of needle insertion, and determination of the depth to the ligamentum flavum, epidural space, and spinal cistern • Should have ultra-durable self-healing tissue is extremely realistic in ultrasound imaging characteristics and feels like real human tissue. • Soft pricking part should be good for at least 1000 pricks before replacement. **Renal Biopsy Ultrasound Training Model** • Excellent for training clinicians in the psycho-motor skills associated with ultrasound guided kidney biopsy procedures • Anatomically correct adult male torso with an ultrasound tissue module containing skin, ribs, and right kidney with surrounding tissue • The kidney internal and external architecture is superb in its realism and imaging characteristics and contains the renal cortex, renal medulla and major and minor calyx • Superb ultrasound imaging characteristics: extremely realistic in ultrasound imaging characteristics and feels like real human tissue • Ultrasound tissue is ultra-durable; self-healing tissue offers a long life providing a low cost of ownership • Users can expect to remove core biopsy samples 30 times before the kidney requires replacement		

	• Easy to reposition or replace kidney as necessary after significant core biopsy use • Package includes a kidney • Ultrasound tissues match the acoustic characteristics of real human tissue so when you use your ultrasound system on our training models, you experience the same quality you expect from imaging patients in a clinical environment • Excellent imaging characteristics using any ultrasound imaging system **Elastography Ultrasound Breast Phantom** • Contains a broad range of elastic masses; gain experience using stiff, soft, as well as isoelastic lesions – all in the same model. • Echotextures that are hypoechoic, isoechoic, as well as echogenic (hyperechoic) • Masses range in size from 6mm to 11mm in size • Ultra-durable models do not require special storage and will not dehydrate or decompose over time which saves you money. • Excellent for B-mode ultrasound imaging as well as elastography ultrasound imaging • Constructed using Blue Phantom's patented ultra-durable and realistic simulated human tissue providing users an extremely realistic training model • Gain imaging and procedural efficiencies using this extremely realistic model • Self-healing tissue • Synthetic tissue will never dehydrate • Excellent for developing and refining the psychomotor skills associated with breast elastography ultrasound procedures • Varying sized masses allows users to develop their skills starting with larger lesions and target smaller masses as their skills progress • Breast lesions present in both the central breast tissue as well as the Tail of Spence • Fluid can be injected into the model to verify needle tip location (automatically expelled) • Feels and biopsies like human tissue • Masses in central breast tissue and the Tail of Spence • Extremely durable; use for repeated training • Use with any ultrasound imaging system with appropriate transducer		

	Soft Tissue Biopsy Ultrasound Training Block Model • Excellent for developing and refining the psychomotor skills associated with ultrasound guided soft tissue biopsy procedures • Contains a variety of masses that are hyperechoic, hypoechoic, and echolucent allowing users to gain experience utilizing a wide range of lesions as they would experience in the clinical environment • Contains 16 masses of varying sizes – ranging from 4mm to 11mm - allowing users to develop their skills starting with larger lesions and target smaller masses as their skills progress • Ultra-durable design saves you money • Self-healing tissue • Synthetic tissue will never dehydrate • Masses present randomly throughout the simulated human tissue • Fluid can be injected into the model to verify needle tip location (automatically expelled) • Convex surface contour offers a scanning environment similar to human body habitus • Use with any ultrasound imaging system with appropriate transducer • Model should be capable for 1000 procedures **Breast Ultrasound Training Model** • Feels and biopsies like human tissue • Contains a variety of hyperechoic, hypoechoic, and echolucent masses • Contains 14 masses of varying sizes – ranging from 4mm to 11mm • Masses in central breast tissue and the Tail of Spence • Extremely durable; use for repeated training • Self-healing tissue • Synthetic tissue will never dehydrate **Peripheral Doppler Ultrasound Training Model** • Peripheral Doppler Ultrasound Training model • Superb 2-D and Doppler flow characteristics • Excellent for learning and teaching how to use ultrasound for the assessment of peripheral arterial and venous blood flow • Use with any ultrasound system configured with Doppler ultrasound capability • Utilize a variety of Doppler techniques to assess		

	the vascular structures in the model including; color Doppler (color flow Doppler), pulsed Doppler, color power Doppler, and continuous wave Doppler • User defined pulsatile or continuous blood flow • Contains the brachial and basilic vessels of the upper arm as well as the radial and ulnar arteries and the cephalic and median cubital veins of the lower arm • Offers users a consistent and repeatable training environment • Excellent for training users in ultrasound guided vascular access procedures • All vessels can be repeatedly cannulated and offers extremely realistic and durable performance • Users can expect extended utility with our self-healing tissue providing over 1000 cannulations without replacement or compromising its excellent imaging quality • Self-healing tissue • Utilize and ultrasound imaging system for simulation training **Paediatric 4 Vessel Ultrasound Training Block Model** • Model should be ultra- durable and realistic simulated human tissue providing users an extremely realistic training model • 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 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) • Learn to acquire and interpret imaging of vessels used for venipuncture • Gain imaging and procedural efficiencies using this realistic vascular access ultrasound training model • Should be able to use with any ultrasound imaging system with appropriate transducer • Soft pricking part should be good for at least 1000 pricks before replacement.		

7	**DIGITAL MAMOGRAPHY SYSTEM**		
	A) X-RAY GENERATOR - High Frequency X-Ray Generator with 50kHz frequency or more should be provided. - Power of generator should be more than 4KW. - Maximum mA output should be more than 100mA - KV Range should be 20 to 35KV in steps of increment of 1 KV each. - mAs Range should be from 1 mAs to 650 mAs or more. - 1 No. High Voltage Cable should be provided. **B) X-RAY TUBE** - Rotating Anode X-Ray Tube having dual focus dual angle should be provided. - Focal Spots should be Small Focus = 0.1 Large Focus = 0.3 - Anode Heat Storage Capacity should be more than 200KHU **C) CONTROL PANEL** Control panel should have below features: - ***Fully integrated system. Imaging system controls X-Ray parameters.*** - Following Technique selections should be provided: □ Zero Point Technique with Digital AEC □ Manual Two Point Technique selector (KV and mAs) □ Anatomical Programming for different Breast sizes. - ***Inbuilt Digital AEC for better exposure control and diagnosis.*** - Multiple step Image Optical Density Control. - Filter should be automatically selected as per the KV selected (Molybdenum filter and Rhodium filter) - Following parameters should be displayed: □ KV □ mAs □ Interlocks indicating the fault in the machine □ Type of filter selected □ Compression force in Kg □ Compressed breast thickness □ Gantry angle		

	- Following Switches should be provided on Acquisition PC graphic interface: □ Focal Spot Selection □ APR/AEC selection □ KV increment and decrement □ mAs increment and decrement ***Breast Release mechanism in case of power failure:*** Push to OFF type emergency switches should be provided on both sides of gantry to release breast in case of power failure. This mechanism should operate from a inbuilt power source Below Safety features should be provided: • Computer controlled exposure parameter selection. Microcontroller based embedded platform to ensure accuracy of these parameters. □ Automatic compression locking after maximum compression of compression paddle. □ Earthing interlock is provided in the machine for safety of user and machine. (Without proper earthing machine would show error). □ Fast Compression release mechanism in case if patient is uncomfortable with compression. □ Automatic breast release after x-ray exposure is completed. **D) STAND ASSEMBLY** - A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube & Bucky Assembly should be provided. - Vertical Movement (Motor operated) should be 650mm or more. - Motorized rotation:+90 degree to -90 degree. - Source to image distance (SID) should be 600mm or more - Breast Compression: Motorized compression with fine manual adjustments of compression force. Automatic Compression release after exposure is over. - Compression Paddles for Normal & Magnification Mode (Spot Compression) should be provided. Compression		

	Scale: 0 to 15 cm. - Magnification Device: 1.8 X should be provided. - 24 x 30cm digital Bucky with 24x30 cm Grid of 5:1, 30 lines/cm. should be provided. - Suitable Filters(Preferably Molybdenum/Rhodium) should be provided. - Light Beam collimator with Halogen Lamp with Auto shut off facility of Light source should be provided. - 18cm x 24cm collimator should be provided. - Cone for Localization & Radiation protection should be provided. - Switches for up/down movement of Gantry, placed conveniently on both sides of Gantry Arm should be provided. ***Separate foot control for gantry movements should also be available for hands free operation.*** - Hand Switch with Retractable cord for initiation of exposure should be provided. - Free standing fully Transparent Lead Glass Screen for operator protection should be provided. E) FLAT PANEL DETECTOR (FPD): A complete imaging solution with cutting edge of performance integrated with our X-ray systems should be provided. SPECIFICATIONS OF FLAT PANEL DETECTOR: ***Direct conversion type solid state flat panel detector.*** ***Type: Amorphous Selenium (a-Se)*** Size: 24cm x 30cm Pixel pitch should be less than 100µm F) IMAGE ACQUISITION SOFTWARE should have below features: ***Acquisition software should have complete control of all image capture functions as well as x-ray parameters within the examination room***, enhancing the entire workflow by delivering diagnostic images instantly and allowing users to move X-ray images electronically to remote workstations, image archives, and printers, also has the superexcellent performance on image quality control such as: • Patient data entry with unique identification accession number. • Instant preview of the captured image • Processing algorithms based on WW/WL , brightness & contrast • ROI (region of interest) Magnification tool • Spilt screen to compare two breasts on same screen • Annotations: Left/right marking, Text additions, Lines, Rectangles, arrow marking and circles in workstation PC		

	should be provided. • Measurements: length, area and angle in workstation PC should be provided. **Networking:** System should be fully DICOM 3.0 compatible which can be configured with existing PACS and RIS over TCP/IP Protocol. -DICOM send/receive, query/retrieve, DICOM print, HIS/RIS work list, storage and, MPPS. ***WORKSTATION: 1 No. DICOM Workstation should be provided.*** G) POWER SUPPLY REQUIREMENT : - Single Phase, 230 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. ***H) Biopsy system*** ***Digital Stereo tactic Biopsy system*** ***- CAD (Computer Aided Detection) software.*** ***- High-resolution LCD monitors of 5 Megapixel.*** **I) Other Requirements:** **The company should be ISO & EN ISO company with USFDA / CE Certified products.** **The unit should be approved by AERB.** The company should have a local Service center. The company should have proven track record in Govt. sector. AERB site approval: Vendors shall be responsible for getting AERB Site Plan approval prior to installation and licensing. Warranty : 60 months from date of satisfactory installation& handing over to the department Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5%limit, extension of the warranty period will be twice the excess downtime period The warranty shall cover all the tunkey work including X-ray tube,detectors,x ray degenertors UPS including battery, control panel ,work stations, power & accessories all consumables.Comprehensive maintenance contract for next five years including all the accessories,turn keywork . Please attach a complete list of spares which will be provided with the equipment		

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Professor & Head
Radiology, RIMS
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Director
Rajendra Institute of Medical Sciences
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