Date: 06-02- 2025

Tender (Ref: IISc-Med-2024-25/3)

GLOBAL TENDER ENQUIRY

To Whom It May Concern

This is an RFQ (Request for Quote) for planning, supplying, installation, testing, commissioning & training of the following equipment/devices; Linear Accelerator (LINAC), MR LINAC, Brachytherapy, Gamma Knife as a package for IISc, Bangalore.

At IISc, the planned infrastructure includes a Linear Accelerator (LINAC) and supporting treatment planning system with Oncology information systems, MR LINAC, Brachytherapy, Gamma Knife. IISc is planning to have research & academic wing, clinical research to develop new treatments and healthcare solutions and imaging modalities will play integral part of research activities.
The vendors are requested to factor this exposure's value into their quotes. Details of IISc can be gleaned from:

https://medicine.IISc.ac.in/

A. Procedure:

1. Vendors are required to submit a technical proposal and a commercial proposal in two separate sealed envelopes. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
2. The deadline for submission of proposals is **February 28, 2025, Monday, 5:30 pm Indian Standard Time.**
3. Bids in the sealed envelope should arrive at the office of Dean (A & F), Main building, Indian Institute of Science, Bangalore 560012, India, by the above deadline.
4. The technical proposal should contain a technical compliance table with 6 columns.
    a. The first column must list the technical requirements in the order that they are given in the technical requirement below in tender specifications.
    b. The second column should provide specifications of the equipment against the requirement (please provide quantitative responses wherever possible.)
    c. The third column should describe your compliance with a "Yes" or "No" only. Ensure that the entries in column 2 and column 3 are consistent.
    d. The fourth column should state the reasons/explanations/context for deviations, if any.
    e. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features and qualify the response of previous columns.
    f. The Sixth column should contain the datasheet & technical offer Page reference number.
5. Vendors are encouraged to highlight the advantages of their equipment over comparable equipment from the competitors.
6. In the commercial bid, please provide the itemized cost of the equipment and required accessories, etc.
7. Please provide itemized cost for any suggested/optional accessories/add-on items that may enhance the equipment usability, capability, accuracy or reliability. Vendors are encouraged to quote for as many add-ons as their product portfolio permits.
8. In the quote, you are requested to provide itemized cost for spares, accessories, consumables expected over 2 years of use.
9. Please indicate the warranty provided with the equipment.
10. Any questions or clarifications can be directed to:

Dean (A & F)
Main building, Indian Institute of Science,
Bangalore 560012
tenders@IISc.ac.in

B. Terms and Conditions

1. Only the Original Equipment Manufacturer or their authorized representatives across the globe shall participate in the bid.
2. The order will be placed only on the bidder who participated in the bid.
3. The decision of the purchase committee of IISc will be final.
4. The vendor is responsible for the planning, supply, installation, testing and commissioning of the equipment & the training of personnel of the installed equipment at the IISc.
5. The RFQ must include references to previous installations including the list of all customers where similar systems were installed in the past 5 years. Please provide the names and contact addresses of the referees so that the committee can contact them independently. Details of such systems with model numbers and users should be provided. The reference letters can be used to disqualify vendors with poor track records of service, build quality, system performance, or poor availability of spares.
6. The vendor should have qualified technical service personnel for the equipment based in India and must assure a response time of <2 hours after receiving a service request. The schedule for periodic preventive maintenance for the equipment and all the items related to OEMs should be provided.
7. The indenter reserves the right to withhold placement of the final order and to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason.
8. Wherever requested in this specifications sheet, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.
9. Upon request, all guaranteed specifications will have to be demonstrated in an active installation. Failure to demonstrate any promised specifications will be deemed as technical non-compliance.
10. Printed literature and published papers to support compliance with the prescribed specifications may be provided duly authenticated by qualified personnel in the company.
11. Technical evaluation by the IISc may include a demonstration to verify the functionalities and capabilities of the equipment quoted. Any discrepancy between the promised and demonstrated specifications will be deemed technical non-compliance. If the need arises, the vendor must be ready to visit IISc for a techno commercial discussion physically.
12. The validity of commercial quotations should be at least 90 days from the last date for the submission of tender documents.
13. **Payment terms:** 100% Payment will be made through an irrevocable and confirmed letter of credit as per below milestones and LC will be issued 4 months before shipment
    a. 70% of the Price shall be paid against presentation of shipment documents.
    b. The remaining balance 30% 180 days from the date of shipment
    c. Supplier will provide a bank guarantee to the institute, for 10% of the PO value, valid for 180 days from date of AERB approval for patient treatment.
14. Price: Currency- Price can be quoted in USD/EURO
    Price quoted should be exclusive of Customs Duty, IGST, CGST, Healthcess, Customs clearance, Entry Tax or any other taxes, Levies etc.
    Customs Duty, IGST, CGST, Healthcess, Customs clearance, Entry Tax or any other taxes, Levies etc. as applicable will be paid directly by the Institute.
    Insurance coverage till site only should be till the Installation of the equipment.
15. The functionalities and capabilities of the equipment to be provided as part of documentation. Any discrepancy in technical specification between what was committed during technical evaluation and demonstrated specification on ground will be deemed technical non-compliance. If the need arises, the vendor must be ready to visit IISc for a techno commercial discussion in person.

C. Other terms

1. Shipment and Delivery Terms

1.1 Partial Shipments

a. Partial shipments are permitted. Transshipment is prohibited for sea shipments but allowed

for air shipments, with the supplier bearing responsibility.

1.2 Delivery Confirmation

a. Delivery shall only be made after receiving written confirmation from the IISc purchase team.

b. Delivery of various equipment as per their standard delivery timelines from the date of LC/AERB NOC/CDSCO approval and any other regulatory agencies for procurement/import of the equipment and site readiness confirmation as per installation guidelines and after receiving written confirmation from the IISc purchase team whichever is later.

c. Linear Accelerator, Brachytherapy delivery up to nearest port within 20-22 weeks and Gamma Knife Equipment delivery up to nearest port within 32-36 weeks from LC/AERB NOC/CDSCO approval and any other regulatory agencies for procurement/import of the equipment and site readiness and upon written confirmation from IISC, whichever is later.

d.MR LINAC Equipment delivery within 12 months from LC/AERB NOC/CDSCO approval and any other regulatory agencies approval for procurement / import of the equipment and site readiness confirmation and upon written confirmation from IISC, whichever is later

1.3 Consignee Details

a. The address of the consignee and the markings on the containers must be clearly stated as per the details provided by IISc.

1.4 Packing Slip and Documentation

a. A packing slip detailing each item and its quantity shall accompany every shipment.

b. The packing slip must be securely attached to the exterior of one of the containers in a visible manner.

c. The purchase order (PO) number must be clearly marked on all packing slips, invoices, and correspondence.

1.5 Missing Items and Substitutions

a. Any items that are not found upon delivery must be clearly noted on the packing slip, and the anticipated availability of such items shall be indicated.

b. Substitutions of items shall not be made without prior written authorization from IISc.

1.6 Packing of Fragile Equipment

a. Fragile equipment shall be packed in wooden boxes to prevent damage during transit.

1.7 Packing of Critical Components

a. Critical components must be packed using foam/bubble wrap and cartons, and securely stuffed within containers to prevent any damage during transit or handling at the site.

1.8 Protection during Transit

a. The Seller shall ensure that all items are securely protected and packed in accordance with best established practices to avoid damage under conditions such as multiple handling, transportation by ship/road, storage, and exposure to heat, moisture, rain, etc.

1.9 Seller's responsibility for damage

a. The Seller shall bear full responsibility for any breakage, damage, or pilferage (including during transit or handling within the hospital) resulting from faulty packing.

1.10 Marking and Packing Slip

a. All packages must be visibly marked with the purchase order (PO) number and name of the Buyer in bold letters.

b. Copies of the packing slip must also be placed inside each package.

2. Insurance and Freight

a. Cost of all Freight & Insurance is Included in the-purchase order value will be arranged by the supplier. The insurance should be from the vendor warehouse to the site till Installation.

2.1 Seller Notification for Insurance

a. If IISc needs to arrange insurance, the Seller must notify promptly.

3. Warranty Terms

3.1 The equipment along with all the 3rd party items should carry a warranty of 12 months from the date of successful commissioning**.**

3.2 The warranty shall commence from the submission of a duly filled "Medical Equipment Acceptance Sheet Checklist," accompanied by all relevant documents, as per the specifications and requirements.

3.3 After-Sale Service

a. After-sales service will be provided by a service engineer trained by the principal company.

b. The credentials and certification of the service engineer shall be shared with IISc for approval.

3.4 Preventive Maintenance and Calibration

a. Preventive maintenance and calibration shall be performed according to the recommendations of the Original Equipment Manufacturer (OEM).
b. Preventive maintenance and calibration shall include calibration for any major breakdowns and be conducted in accordance with local rules and regulations, as well as OEM recommendations.
c. Maintenance and calibration shall also be based on the equipment performance history, using calibrated equipment traceable to international or NABL standards, as required.

3.5 Responsibility for Malfunctions

a. The seller shall take full responsibility for any mishaps or malfunctions related to the ordered equipment caused by delayed periodic maintenance or calibration under warranty & subsequently in a comprehensive annual maintenance contract.

3.6 Maintenance and Calibration Costs

a. Preventive maintenance and calibration shall be executed free of cost during the warranty and Annual Maintenance Contract (AMC) period.
b. The seller shall clearly inform IISc about the list of consumables or maintenance kits that may incur additional costs (not covered under the maintenance contract) before the equipment is supplied.
c. All accessories, including PC's, laptops, shall be covered under warranty/CMC for any obsolence for minimum 7 years. (accessories, batteries, consumables, printers etc. are excluded under CMC)

3.7 Annual Maintenance Contract (AMC) and Comprehensive AMC (CAMC)

The CAMC rate shall be quoted absolute value of the equipment cost per year till nine years post warranty period of equipment. Please refer the template for GENERAL TERMS AND CONDITIONS FOR COMPREHENSIVE/LABOUR MAINTENANCE CONTRACT(CMC/AMC).

3.8 No Additional Terms to be imposed

a. The seller shall not impose any additional terms on the buyer when an Annual Maintenance Contract (AMC) is established on a yearly basis.
b. All the terms mentioned in the tender and subsequent purchase order shall remain applicable without any modifications.

3.9 Warranty Terms during CAMC

a. The warranty terms, including those for preventive maintenance and calibration, shall remain valid and applicable throughout the duration of the CAMC, as per the terms outlined in the tender and subsequent purchase order.

3.10 Payment for AMC and CAMC

a. Payment for CAMC will be made on a quarterly or annual basis.
b. Payments will be disbursed upon the successful completion of preventive maintenance and calibration activities, in line with the terms and conditions of the tender and subsequent purchase order.

3.11 Consumables List

a. The vendor shall provide a list of consumables required for the equipment, along with their associated costs, before the supply of the equipment to IISc.
b. The vendor should provide the price for the second source for Brachytherapy and Gamma knife (The price should include reloading of the source and reexport of decayed source).

3.12 Equipment Recall and Standby Equipment

a. The vendor shall notify IISc of any recall related to the supplied equipment and ensure proper action is taken as per the buyer's recall terms and policies.
b. In the event of an equipment recall, the seller shall provide suitable standby equipment, ensuring the clinical functionality of the buyer is not impacted.

3.13 Adverse Event Reporting

a. Any adverse events associated with the medical devices shall be promptly reported to IISc.
b. The vendor shall ensure that any adverse event is communicated to the National Collaboration Centre-Materiovigilance Programme of India, in accordance with regulatory requirements.

4. Maintenance and Calibration

4.1 Preventive Maintenance and Calibration

a. Preventive maintenance and calibration will be conducted free of charge under the warranty period and any subsequent Annual Maintenance Contracts (AMC).
b. Calibration will be performed in accordance with industry standards and OEM specifications.

4.2 Report of Maintenance and Calibration

a. The Seller shall provide a report of maintenance and calibration with details of the work performed, including calibration standards and methods.

4.3 Qualification of Engineers

a. The Seller must ensure the trained engineers are certified and qualified for preventive maintenance and calibration.

5. Spare Parts

5.1 Supply of Spare Parts

a. The Seller shall supply spare parts for the entire lifetime of the equipment and guarantee availability for a minimum of 10 years from the date of commissioning of equipment.

5.2 Price of Spare Parts

a. The Seller will provide the prices of major spare parts, and each individual part pricing should not exceed 30% of the total equipment value.

b. A list of critical spare parts and their estimated prices shall be submitted with the tender as part of commercial bid.

5.3 Spare Parts Availability

a. The Seller must maintain a minimum stock of spare parts to ensure quick availability for repairs.

5.4 Spare Parts Pricing

a. The prices of spares shall be firm for 3 years, after which adjustments can be negotiated considering inflation, customs duty and exchange variations.

6. Uptime and Compensation

6.1 Uptime Requirement

a. The bidder must ensure a minimum uptime of 97% based on a 365-day excluding national Holidays.

b. In case the uptime falls below the specified 97%, the Warranty/CAMC shall be extended by a ratio of 1:3 days for every additional day of downtime

6.2 Compensation for Test Failures or Erroneous Results

a. The seller shall be liable to compensate the buyer for any test failures or erroneous results generated by the ordered equipment.

b. The compensation amount will be mutually agreed upon by both parties, and this provision will be legally binding.

7. Software and Support Services

7.1 Software Licenses

a. All software supplied as part of the equipment must come with the necessary licenses for use in India.

The supplied application & operating system software will be kept updated in the form of Free of cost as & when they are released by the factory.

However, for new application software any additional hardware is needed, the cost will be borne by IISc management at negotiated special price.

7.2 Software Support Services

a. Any software updates or bug-fixing services will be free of charge during the lifetime of equipment.

8. Integration with Clients HIS & PACS-RIS

8.1 Integration Requirement

a. The Seller must integrate the Oncology Information System provided/supplied along with the equipment's with clients' Hospital Information System (HIS) & PACS-RIS at no extra cost.

9. Confidentiality and Ownership Transfer

9.1 Confidentiality

a. The service provider must not acquire or retain any confidential data from IISc.

9.2 Ownership Transfer

b. Any change in the ownership of the principal company must honor all existing agreements with IISc.

10. Recall of Equipment

10.1 Equipment Recall

a. In the event of any recall of equipment, the Seller shall promptly inform IISc in writing.

b. During the period when the equipment is under recall, the Seller shall provide suitable standby equipment of similar or higher specifications to IISc, at no cost.

11.Force Majeure

If either Party is unable to carry out his obligations under this Contract due to an Act of God, war, riot, blockade, strike (I.e. national/ state or city), lockout, flood or earthquake or Government orders/ restrictions not within the control of the parties hereto which results In an Inability, In spite of due diligence of either party in performing its obligation In time, this Contract shall remain effective, but the obligation which the affected party Is unable to carry out shall be suspended for a period equal to the duration of the relevant circumstances provided that :

The non-performing party shall give the other Party prior written notice describing particulars of the Inability including but not limited to the nature of occurrence with its expected duration and the steps which the non-performing parties is taking to fulfil its obligation.

Upon receipt of such notice the other party shall discuss the matter with the non-performing party with a view to helping the non-performing party to fulfil obligations. This clause does not envisage financial assistance.

If in any event the Force Majeure situation continues for a period of three weeks both the parties shall meet again and discuss whether the Contract can be amended to overcome the Force Majeure situation so the Project can proceed further.

Notwithstanding anything contained to the contrary it is clarified that economic hardship, non-- availability of material, labor and transport shall not constitute Force Majeure. The overall responsibilities and obligations of the parties shall not be excused by reasons of Force Majeure situation.

Notwithstanding the above If the Force Majeure continues for a period of three months or more in that event without prejudice to the rights of the parties, the Buyer shall have the right thereafter to terminate this contract.

12.Seller's Personnel at Buyer's Premises

12.1 Adherence to Safety Regulations

a. Seller's personnel on IISc premises must adhere to all IISc safety regulations and protocols.

12.2 Seller's Responsibility for Personnel's Safety

a. The Seller is responsible for their personnel's safety and health while on IISc premises and shall indemnify IISc for any accidents or injuries.

13.Site Evaluation

a. The Seller must conduct a site evaluation including transportation path, power, air conditioning and other requirements before equipment installation.

b. The Seller shall submit detailed drawings, specifications, and color codes for all ordered items for Buyer review and approval via email or other methods. Manufacturing shall commence only after drawing approval and joint inspection of the proposed site.

14.Skilled & trained Engineer for Installation

a. Installation must be carried out by a skilled engineer and is considered complete only when the equipment is fully operational as per the tender specification.

15.Inspection and Quality Plan

15.1 New Equipment Requirement

a. Only brand-new equipment will be accepted, and it must be accompanied by quality conformance and manufacturer test certificates.

15.2 Training

a. Hands-on training for IISc engineers and technicians must be provided at no extra cost.

LINAC - Minimum Two weeks onsite training for all staff and clinical users should be provided by the Supplier as per mutual convenience.

MR LINAC– Minimum 6-8 weeks onsite complete training for all staff clinical users should be provided by the Supplier as per mutual convenience.

MR LINAC – Minimum 4-5 days overseas training (subject to regulatory/statutory approvals at a reputed institute for 4 staff / clinical users (Radiation Oncologist, Technicians & Physicist) should be provided by the Supplier as per mutual convenience. If Overseas training cannot be provided alternatively training should be provided in a reputed institution In India

Brachytherapy- (Minimum 4-5 Days) onsite training for staff and clinical users should be provided by the Supplier as per mutual convenience.

Gamma Knife – Minimum One-week onsite application training for all staff clinical users should be provided by the Supplier as per mutual convenience.

Gamma Knife – Minimum 4-5 days overseas training (subject to regulatory/statutory approvals) at a reputed institute for 4 staff clinical users (Neuro Surgeons) should be provided by the Supplier as per mutual convenience. If Overseas training cannot be provided alternatively training should be provided in a reputed institution In India

Third party items (SGRT and Dosimetry items) - (Minimum 4-5 Days) onsite training for all staff clinical users should be provided by the Supplier as per mutual convenience.

A refresher training should be provided after 6 months of commissioning of the equipment for 1-2 days at site as per mutual convenience

16.Marketing Support

a. The Seller shall provide marketing support to IISc as mutually agreed upon.

TEMPLATE FOR ACCEPTANCE OF MEDICAL EQUIPMENT FOR CLINICAL USAGE

Sl.No.	**MEDICAL EQUIPMENT PRE-COMMISSIONING CHECK-LIST (To be filled during commissioning handover)**	**Vendor to fill the details**
1	Equipment name	
2	Main Unit Model & Serial No	
3	Date of receipt of equipment at site	
4	Goods opening report (item wise)	
5	Principal Company name	
6	Dealer/ Vendor name	
7	Vendor contact details including email address	
8	Equipment Model name	
9	User Department name	
10	End User (Head of Dept) Signature	
11	Clinical Engineers name	
12	Clinical Engineers Signature	
13	Service Engineers name and Contact number	
14	Application specialist name and contact number	
15	Main Unit - hardware as per Purchase Order (Vendor-signed PO and list of items supplied as per PO with invoice) to be enclosed as part of the commissioning documentation.	
16	Main Unit - software as per Purchase Order (Vendor-signed PO and list of software supplied as per PO with invoice) to be enclosed as part of the commissioning documentation.	

17	OEM items as per Purchase Order (Vendor-signed PO and list of items supplied as per PO with invoice) to be enclosed as part of the commissioning documentation.	
18	Accessories as per Purchase Order (Vendor-signed PO and list of items supplied as per PO with invoice) to be enclosed as part of the commissioning documentation.	
19	Consumables as per Purchase order (Vendor signed PO and List of items supplied as per PO with invoiced) to be enclosed as part of commissioning documentation.	
20	Brochure of equipment to be enclosed as part of the commissioning documentation.	
21	Technical Data Sheet to be enclosed as part of the commissioning documentation.	
22	Set of service manuals (1 hard copy & 1 PDF soft copy) to be handed over to the Clinical Engineering Dept.	
23	Set of instruction manuals - Two copies (1 hard copy and 1 PDF) to be handed over to the Clinical Engineering Dept.	
24	List of spares & additional accessories with re-ordering codes and costs used along with the equipment as a standard package (PDF).	
25	Equipment demo training information materials like PPT/Video to be handed over to the Clinical Engineering department.	
26	Duly signed letter from the vendor organization head (MD/CEO) stating that the supplied unit, accessories & OEM items are brand new from the factory, to be enclosed as part of the commissioning documentation.	
27	Quality test certificate of equipment from the factory, duly signed by the factory production in-charge, to be enclosed as part of the commissioning documentation.	
28	Software license document (PDF); including OS, system and application software, and commitment to support over the lifetime of the equipment, to be enclosed as part of the commissioning documentation.	
29	All cables from the equipment should have proper cable management, i.e., cable labelling.	
30	2S and HIRA (Hazard Identification and Risk Assessment) to be conducted during preventive maintenance wherever applicable to keep the working area clean.	
31	First-level training to Clinical Engineering (training certificate).	
32	Application training to the end-user on all functions demonstrated (training certificate).	
33	Do's and Don'ts for the equipment for the user group to be provided as part of the training module, to be enclosed as part of the commissioning documentation.	
34	Preventive maintenance frequency calculated based on Equipment Risk Classification, Usage and Operational Intensity, Manufacturer's Recommendations, Historical Performance, and Failure Data.	
35	Preventive maintenance (PM) checklist to be predefined & duly filled during preventive maintenance, to be enclosed as part of the commissioning documentation.	
36	Preventive maintenance kit specification & details to be shared in advance, to be enclosed as part of the commissioning documentation.	
37	Preventive maintenance schedule should be done during non-clinical work operational hours based on prior approval from the user.	
38	Calibration schedules should be based on Manufacturer's Recommendations and after every major equipment breakdown servicing.	
39	The calibration process should follow NABL 126 guidelines.	

40	With each maintenance work, the service provider should hand over two physical copies of the service report (one for the user and one for the Clinical Engineering Dept.) along with a duly filled PM checklist. If physical copies are not available, soft copies should be provided to both the user and the Clinical Engineering Dept. Accepted downtime in hours & accepted equipment breakdown frequency as per PO terms should be understood by the service team, including downtime penalty	
41	Accepted Downtime in hours & accepted equipment breakdown frequency as per PO terms are understood by the service team including downtime time penalty.	
42	The service provider should maintain a logbook of maintenance at the user site.	
43	Shelf-life details of critical spares/accessories/consumables to be provided, to be enclosed as part of the commissioning documentation.	
44	Commissioning report should include (IQ/PQ/OQ) as part of equipment commissioning documents, duly signed by the user group, to be enclosed as part of the commissioning documentation.	
45	Cleaning & disinfection methodology, including the material used, to be provided at the time of commissioning of equipment, to be enclosed as part of the commissioning documentation.	
46	User application training schedule to be provided along with the PM schedule.	
47	Training materials soft copy (PPT/Video) to be shared for installation sign-off.	
48	Letter from the principal manufacturer stating their commitment to IISc for support of equipment for the coming years as per Purchase Order terms to be provided.	
49	CE/FDA/CDSCO Certificate to be enclosed as part of the commissioning documentation.	
50	The single-phase power cord supplied along with the equipment should have a 3-pin plug (Neutral, Phase, Earth) for Indian usage.	
51	Warranty card and details of the warranty to be enclosed as part of the commissioning documentation.	
52	Short shipped items (if any) with quantity. The warranty will start only after full supply, installation, testing, and commissioning of hardware, application software, and third-party equipment supplied along with the main equipment.	
53	OEM and Dealer Sales and Service Escalation contact details, including CEO/MD, to be enclosed as part of the commissioning documentation.	
54	Life of the equipment as committed during technical discussions to be provided with maintenance and spare support during the course of the year, irrespective of dealer change, as per PO terms and conditions, to be given on the OEM letterhead. In case the OEM stops service support during the sales-committed life, the vendor is expected to compensate with the depreciated cost of equipment or provide buyback or upgrade options according to the hospital's requirements.	
55	Any adverse events and recalls related to the equipment, if reported, need to be intimated to IISC in a timely manner to ensure patient & staff safety by the vendor.	
	Signature: User Dept Head Head-Clinical Engineering	
	Date and Time	
	All these details should be given in a spiral bound document by vendor to IISc.	
	EQUIPMENT WARRANTY WILL START ONLY AFTER FULL COMPLIANCE OF ABOVE FORM	

GENERAL TERMS AND CONDITIONS FOR COMPREHENSIVE/LABOUR MAINTENANCE CONTRACT(CMC/AMC)	
1)	ALL TERMS AND CONDITIONS REMAIN UNCHANGED AS PER SALES PO
2)	AMC & CMC VALID FROM _____ TO _____
3)	THIS CONTRACT INCLUDES
1	All equipment and items supplied by the OEM are covered under service contracts and must be replaced /repaired free of cost under CMC.
2	All equipment must be serviced by trained, authorized service engineers. The training certificate of the engineer must be submitted to the IISC Clinical Engineering Team in advance.
3	Preventive maintenance frequency is calculated based on equipment risk classification, usage, operational intensity, manufacturer's recommendations, historical performance, and failure data.
4	The equipment preventive maintenance must be performed according to the predefined checklist provided in the service manual.
5	Operating system and anti-virus updates are an integral part of preventive maintenance.
6	The vendor will not allow their service engineer to train junior staff on our equipment.
7	Vendor to attend unlimited breakdown calls.
8	Call response time of two hours to be maintained; response time to attend calls within 4 hours is applicable, including holidays and non-working hours.
9	The breakdown frequency should not exceed twice the preventive maintenance frequency. If the breakdown frequency exceeds four times, proactive services should be provided based on mutual agreement.
10	Vendor must submit soft copies of all reports in two copies.
11	Vendor must maintain a service logbook at the user department.
12	Yearly downtime and breakdown frequency will be calculated based on the call logbook.
13	Any damage to hospital property during maintenance by the company engineer should be compensated to the hospital.
14	Vendor must ensure two preventive maintenance visits per year before the due date. Any malfunction or harm to the patient due to delayed preventive maintenance or calibration will be the sole responsibility of the vendor, including legal compensation. Preventive maintenance and calibration must be mandatory after repair or replacement of any spare parts, and necessary kits are to be provided FOC.
15	A copy of the preventive maintenance report with a checklist and a soft copy of calibration, if applicable, is to be shared within one day of execution. The preventive maintenance and calibration label, with done and due dates, must be affixed to the machine without fail, along with the clinical engineer.
16	Periodic training to clinical engineers and end-users, as and when applicable, is mandatory. Training documents must be provided for all concerned staff prior to the renewal of the contract. It is the vendor's responsibility to ensure training, including application training for all staff, without fail. Relevant training materials like PPT/Video must be submitted to the clinical engineering team prior to any training.
17	Vendor should provide the cleaning and disinfection protocol for the equipment, carry out necessary training periodically, and ensure that all concerned members are trained on the same.
18	Any recall related to the above equipment must be notified in writing, and required corrective actions must be carried out FOC. Necessary training must be provided to concerned staff.
19	Any adverse event reported must be intimated to the Materiovigilance department, and corrective action must be shared within one working day with the hospital.
20	Complete breakdown details, including downtime and preventive maintenance/calibration history, must be shared before the renewal of the next contract. Any downtime of more than 48 hours must include root cause analysis and corrective & preventive action with due diligence. Service reports must be legible and include call received, call attended, and call closed (including date & time) accurately. Any report missing this

	information will be deemed incomplete.
21	Unlimited spare support must be provided, except for consumables (filters). All accessories and parts are covered and included in the contract. Spares must be ordered and moved immediately after diagnosis, including during holidays and non-working hours.
22	Uptime must be maintained at 97%, excluding National Holidays.
23	Uptime is defined by the machine working for its intended purpose without compromising patient care or revenue. Any deviation will count as downtime, and for any additional downtime, the contract will be extended by 1:3 days.
24	The vendor escalation matrix, including sales and service contact details (mobile numbers & email IDs), must be provided without fail.
25	First-level service training must be provided for the concerned equipment, and the training report must be provided to the clinical engineering team members.
26	Preventive maintenance must not be executed during peak working hours and must be carried out as per the user's convenience. The preventive maintenance kit is included in the CMC and must be replaced during preventive maintenance.
27	The AMC bill will only be cleared after the submission of the equipment log report, which must include details of downtime and preventive maintenance (PM) or calibration history. This report must be provided prior to the renewal of the contract.
28	For equipment under AMC, the quotation for spare parts must be provided within one day of the service engineer's recommendation in the service report.
29	For equipment under AMC, no cannibalization of spare parts from working equipment by the service engineer is allowed.
30	Any spare part ordered for equipment under CMC must reach the hospital site within 120 hours.
31	If the equipment remains non-functional after spare part installation, the concerned service engineer must be replaced from the IISC site.
32	All defective spare parts under labor AMC will be retained by the hospital. For equipment under Comprehensive AMC, IISC will mark the spare part as defective, and a non-returnable gate pass will be issued.

Template for purchase order terms
General: Acceptance of this Purchase/ Work Order (hereinafter referred to as "PO/Order") includes the acceptance of the following terms & conditions and is made expressly conditional on Seller's assent to the exact terms contained herein. None of the terms in the Order may be modified, added to, or superseded, except with the written consent of Indian Institute of Science ("Buyer").
1.**Price:** The prices mentioned in this Order are the prices at which Buyer has agreed to purchase the Goods or Services (as applicable). No escalation in the aforesaid prices shall be binding on Buyer, notwithstanding anything that may be mentioned in Seller's terms of acceptance of Order.
2.**Advice of Dispatch:** A full and comprehensive dispatch advice notice shall be sent to stores or concerned departments of the Buyer ("Buyer Stores"). Instructions regarding dispatch & Insurance as mentioned in this Order should be complied with and the packing slips giving reference of Buyer order number shall be included securely with the goods in closed envelopes.

3.**Delivery Terms:** (a) Deliver Date: Time is the essence in any Purchase Contract. Time of delivery/performance as mentioned in this Order shall be the essence of the Agreement and no variations shall be permitted except with prior authorization in writing from the Buyer. (b) Place of Delivery: The goods/services shall be delivered/performed strictly as per the instructions in the Order. All Goods/Services delivered/performed at should reach Buyer Stores before 2.00 p.m. on weekdays except that no deliveries/ dispatches shall be made or accepted on Sundays or holidays in the working place of the Buyer. (c) Delayed Delivery: The time and date of delivery/performance as stipulated in the Order shall be deemed to be the essence of the Agreement. In case of delay in performance of its obligations by the Seller, or any extension granted by the Buyer, the Buyer shall at his option either (i) accept delayed deliveries at price reduced by a sum/ percentage (%) mentioned in the Purchase Order for every week of delay or part thereof; and/or (ii) cancel the Order in part or in full and purchase such cancelled quantities from open market at the prevailing market price at the risk & cost of the Seller without prejudice to his rights under 3(c) (i) noted above in respect to the goods delivered; and/or (iii) refuse to accept the Goods delivered beyond the delivery date and claim/set-off the difference between the prevailing market price and contracted price of such quantity delivered belatedly by the Seller. (d) Delay due to force majeure: In the event of cause of force majeure occurring within the agreed delivery terms, the delivery date may be extended by the Buyer at its sole and absolute discretion on receipt of application from the Seller without imposition of liquidated damages. Only those cause which have duration of more than seven (7) consecutive calendar days will be considered the cause of force majeure. The Seller must inform the Buyer, by a Registered Post or courier letter duly Certified by the Chamber of Commerce or Statutory Authorities, the beginning and the end of the cause of delay immediately, but in no case later than ten (10) days from the beginning and end of each cause of force majeure as defined above. (e) The goods shall correspond with the description of the samples of the original specification thereof in full details and must be delivered and dispatched within the stipulated time, as the case may be. Otherwise, the same shall be liable to be rejected and the Seller shall be deemed to have failed to deliver the goods in breach of the PO. The Buyer shall in that event at its sole and absolute discretion, will be entitled to either purchase such goods from other sources on Seller's account, in which case, the Seller shall be liable to pay to the Buyer any difference between the price at which such goods have been purchased and the price calculated at the rate set out in this Order or to hold the Seller liable to pay the Buyer damages for non-delivery of goods for such breach. (f) Packing: Goods supplied against this order must be suitably and properly packed (conforming to special conditions stipulated by the Buyer, if any, for safe and/or undamaged transport by road or rail.)

4. **Examination of goods:** Irrespective of the fact that the goods are delivered to the Buyer by the Seller at the Seller's place or at Buyer's said office or are dispatched as per Buyer’s instructions by rail or road, the goods shall always be supplied, subject to detailed inspection, at the Buyer works or such other destinations as specified in the Order for ascertaining whether the goods are in conformity with the Agreement or not and until then in no event the Buyer shall be deemed to have accepted such goods and upon any rejection of goods in question the Seller shall be deemed to have failed to deliver the concerned goods in accordance with the Agreement.

5. **Rejection/ Removal of rejected goods and replacement:** Buyer shall have the right to reject the goods whether in full or parts which are not delivered in accordance with the terms of the PO. within fifteen days from the receipt of the intimation from the Buyer of his rejection to accept the goods the Seller shall remove, at his own cost, the rejected goods from the Buyer's works or wherever such goods are lying. The Buyer shall not be in any way responsible for or be held liable for any loss or deterioration of the rejected goods as this shall be at the Seller's risk entirely. The Seller shall pay to the Buyer reasonable storage charges for storing such rejected goods for a period exceeding 15 days as aforesaid. Upon rejection, if the Seller fails to replace the goods with the goods acceptable to the Buyer within the contractual period then the Buyer may, solely at his discretion, exercise all or any of the following options in respect of the rejected/undelivered quantity:- a. Dispose-off the rejected goods and claim/set-off the difference between the prevailing market price and contracted price of such undelivered/rejected quantity to the Seller’s account; and/or b. purchase such undelivered/rejected quantity from the open market at the prevailing market price at the risk and cost of the Seller.

6. **Transit Insurance:** In case insurance is not included in Seller's scope he must furnish details such as reference, Lorry Receipt, Note No., nature of packing, number of cases, gross weight net weight, train carrying the goods, value of the goods dispatched etc. immediately on dispatch to Buyer's office to take up insurance in case of goods sent by Regd... Post, the Regd. Post parcel No. should be furnished to the Buyer with a packing slip when action will be taken to insure the goods. This procedure will be adopted unless specially advised by the Buyer to the contrary.

7. **Insurance:** Seller agrees that during the term of its performance hereunder, it shall, at its sole cost, maintain worker's compensation insurance and other legally required insurance in accordance with and meeting requirements of applicable law.

8. **Invoices:** All bills/ invoices for supplies/ services made bearing registration number of the Seller should be marked to concerned Office or as mentioned in Order (quadruplicate) duly endorsed with Purchase Order, Reference Number and Date and be accompanied by advice of dispatch detailed packing list and by an appropriate certificate necessary under the GST Registration Rules and Regulations.

9. **Billing Instructions:** Seller must follow the billing instructions carefully and correctly to enable early settlement of his dues. Disregarding the same may involve delay in such settlement. Seller must mention the following information in his bill: (1) Vendor Code Number (2) Purchase Order Item Number (3) Material Code Number, if any. The abovementioned information will be always available in this Order sent to him. One copy of the above document is to be sent to Buyer at The Assistant Registrar, Stores and Purchase Section, Indian Institute of Science, Sir C V Raman Avenue, Bengaluru-560012 or to the address as advised by the Buyer.

10. **Compliance with laws:** It is clearly reiterated that the Seller is representing an Entity which is strictly complying with all the Laws of the Land as is expected generally from a Seller of a product. It is also made explicitly clear that (a) the Seller has and shall maintain as valid shall under this order strictly comply with the specifications and the requirements agreed upon. At any given point of time, the seller is obliged to produce all applicable licenses, permits, approvals, authorizations and/or or other statutory approvals required to perform its obligation/s under the PO; (b) shall at all times duly observe, perform and comply with all obligations, requirements and/ or prohibitions contained in any statutes, regulations or ordinance of any authority whether governmental or provincial, relating to or in any way affecting or regulating the respective performance of the PO by it.

11. **Standard GST Clause:** a. The price quoted in this PO for supply of goods shall be exclusive of any applicable Goods and Services Tax, Customs duties, or any other indirect tax as may be imposed by the Government of India from time to time. The Seller shall provide a proper invoice in the form and manner prescribed under GST Invoice Rules containing all the particulars mentioned therein. In the event that the Seller fails to provide the invoice in the form and manner prescribed under rules, Buyer shall not be liable to make any payment against such invoice. Notwithstanding anything contained anywhere in the Agreement, in the event that the input tax credit of the GST charged by Seller is denied by the tax authorities to Buyer, Buyer shall be entitled to recover such amount from the Seller by way of adjustment from the next invoice. In addition to the amount of GST, Buyer shall also be entitled to recover interest at the applicable rate and penalty, in case any penalty is imposed by the tax authorities on Buyer. b. As required by any applicable legislation, where identifiable cost savings are realized by virtue of the enactment of the GST law, those cost savings will be reflected in the calculations of the consideration under this Agreement and shall be passed on by the Seller to Buyer. c. Event of default clause – In the event that the Seller does not deposit the GST charged on the invoice issued to Buyer or such GST charged on the invoice and paid by Buyer is not reflected in online tax credit ledger on common GSTN portal of the govt. as eligible input tax credit for any reason whatsoever, this Agreement shall be liable to be terminated with immediate effect and Seller shall be liable to pay such damages as may be reasonably estimated by Buyer. In the event that the compliance rating prescribed under the GST Act, 2017 read with GST Rules, 2017 of Seller falls below prescribed level for any reason whatsoever, this Agreement shall be liable to be terminated with immediate effect and Seller shall be liable to pay such damages as may be reasonably estimated by Buyer. d. Representation and warranties clause – The Seller represents and warrants that it shall have and maintain in effect level of compliance rating as prescribed by the govt.

12. **Warranty:** The Seller warrants that goods and/or services supplier shall be of the highest grade and quality unless otherwise specified; shall conform to the specifications, drawings, samples or other descriptions contained in the Order or furnished or specified by the Buyer; shall be performed in a workmanlike manner; shall be fit and sufficient for the purpose intended; shall not violate any third party intellectual property rights and shall be merchantable, of good material and workmanship and free from all the defects whether latent or patent. In case the same is found to be defective, inter-alia, in respect of materials, workmanship, design or process of manufacturing within a period 12 months after the same had been put in use or 20 months from the date of acceptance of the goods by the Buyer, whichever is earlier, the Seller shall refund the price paid by the Buyer in respect of the said goods. The Seller shall guarantee that the material Seller further agrees that all materials / goods shall be repaired or replaced as the case may be as noted in Clause 20 below. All spare parts should carry the following: a) Name of the Machine b) OEM/Party's name c) Sr. at his / her own expense. The Seller shall be liable for all costs and damages and replacements at the sole option of the Buyer. These warranties are in addition to those implied by or available at law to Purchaser and shall exist notwithstanding the acceptance and/or inspection by Purchaser of all or part of the goods or services.

13. **Right of the Buyer to Set Off:** In the event, the Seller fails to deliver the goods in accordance with the terms of this PO, the Buyer shall have the right to cancel the PO forthwith and claim refund of any payment made by the Buyer as advance or otherwise to the Seller under the PO. The Buyer shall also have the absolute right to withhold, adjust, and/ or set-off any payment required to be made by the Buyer to the Seller under this PO or any other PO entered into between the parties against the cost, losses, damages etc. suffered by the Buyer due to the failure of the Seller to deliver the Goods in accordance with the terms of this PO, and the Seller expressly waives any objections it may have in this respect.

14. **Cancellation/Termination:** The Buyer reserves the right to cancel/terminate this Purchase Order or any part thereof. The Buyer shall be entitled to rescind the Agreement wholly or in part in a written notice to the Seller if (i) The Seller fails to comply with the terms of the Purchase Order; or (ii) The Seller goes bankrupt or goes into liquidation proceedings; or (iii) The Seller fails to deliver the goods on time and / or replace the rejected goods promptly; or (iv) the Seller fails to deliver the Goods/Services of desired quality, weight, specification, drawing, layout, design, etc.; or (v) The Seller makes general assignment for the benefit of the creditors; or (vi) Receiver is appointed in respect of property of the Seller. The Buyer shall also be entitled to cancel this Order without assigning any reasons or becoming any way liable in such cancellation.

15. **No Assignment:** This Purchase Order shall not be assigned to any other agency by the Seller without obtaining prior written consent of the Buyer.

16. **Force Majeure**: Failure or omission to carry out or observe any of the stipulation or condition of the Agreement shall not give rise to any claim or be deemed a breach of the Agreement if the same shall arise from any of the following causes. viz. the imposition or restriction on Import, Acts of God. The Seller submits his acceptance of this agreement with the above conditions by acceptance of Buyer's Order even in cases where the confirmation has been made under assumption of different conditions.

17. **Special Conditions:** Seller will ensure that all statutes, regulations of the Central or State Government are strictly followed. Buyer shall not be liable to pay any damages/compensation due to non-compliance of these rules / regulations by Seller.

18. **Arbitration:** Any dispute arising out of or in connection with the agreement shall be settled by Arbitration in accordance with the Arbitration Conciliation Act, 1996. The arbitration proceedings shall be conducted in English in Bengaluru by the sole arbitrator appointed by the Buyer. The cost of arbitration shall be shared equally between the parties unless decided otherwise by the arbitrator.

19. **Dispute & Jurisdiction of Bengaluru:** All disputes shall be subjected to the exclusive jurisdiction of the court in Bengaluru only or as provided in the PO/Order.

20. **Limitation of Liability:** In no event shall Buyer be liable to Seller, or to Seller's officers, employees or representatives, or to any third party, for any indirect, consequential, incidental, special, punitive or exemplary damages of whatsoever nature (including, but not limited to, lost business, lost profits, damage to goodwill or reputation and/or degradation in value of brands, trademarks or trade names, service names or service marks, or injury to persons) whether arising out of breach of contract, warranty, tort (including negligence, failure to warn or strict liability), contribution, indemnity, subrogation or otherwise.

21. All spare parts should carry the following: a) Name of the Equipment b) OEM/Party's name c) Sr. No. as per the catalogue d) Buyer's Order No. and date and e) Quantity all relevant information.

22. Works carried out in Buyer's Institution or premises by the Sellers representatives etc.: Agent representative or employees of the Seller who in pursuance of the Agreement have to work in Buyer/Owner's Institution/Premises will be subject to the rules and regulations existing in the works. The Buyer shall not be liable for any accident which may cause to the Sellers personnel.

23. **Intellectual Property Rights:** All drawings, specifications and other documents furnished by Buyer and the Buyer's consultants, and copies thereof furnished to the Seller, are for use solely with respect to this Order. Such drawings, specifications and other documents are to be returned to the Buyer at the completion of the Order or earlier termination of this Agreement. All drawings, specifications and other documents prepared by or for Seller in contemplation of, in the course of, or as a result of performing the work shall be deemed works for hire and all right, title and interest therein shall vest in Buyer, whether or not the Order is ultimately completed. To the extent such drawings, specifications or other documents cannot be considered, by operation of law, works for hire, Seller shall assign to Buyer all right, title and interest thereto and all copies of such drawings, specifications and other documents shall be delivered to Buyer upon completion of the Order or earlier termination of this Agreement. Seller agrees to provide Buyer with reasonable assistance necessary to perfect Seller's interest in intellectual property created under this Agreement. This shall include, but not be limited to, the execution of documents necessary for the Copyright registration. No drawings, specifications or other documents may be used by the Seller or any Sub seller or material or equipment supplier on other projects or for additions to their Project outside the scope of the work without the specific written consent of the Buyer. The Seller, Sub suppliers, Sub-Sub suppliers and material or equipment suppliers are authorized to use and reproduce applicable portions of the drawings, specifications or other documents appropriate to and for use in the execution of their work under the contract documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the drawings, specifications and other documents prepared by or for the Buyer. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Purchaser's copyrights or other reserved rights. Any intellectual property conceived or developed during the course of the Order based upon or arising from Buyer's confidential and proprietary information shall be solely owned by Buyer. Except as expressly provided herein, no license or right is granted hereby to the Seller, by implication or otherwise, with respect to or under any patent application, patent, claims or patent or proprietary rights of Buyer.

24. The terms and conditions of this Order constitute the entire Agreement between the parties here to and changes will be binding only if the amendments are made in writing and signed by the authorized representatives of the Buyer and the Seller.

25. Risk of loss and/or damage to any goods furnished hereunder shall be upon Seller until the goods are physically delivered to Buyer's facility specified on the face of the Order and accepted by the Buyer.

26. **Indemnification:** Seller agrees to defend, indemnify and hold harmless the Buyer, its affiliated companies or parent companies, and their officers, employees, agents, guests, invitees and customers from and against any and all liability, loss, damage, fine, penalty, cost or expense (including attorneys' fees) by reason of any allegation, claim, action or suit, whether for death, personal injury, property damage or otherwise, arising out of (1) failure of the goods or services supplied to meet specifications or warranties or for the goods or services to be otherwise defective; or (2) any alleged or actual, direct or contributory infringement or misappropriation of any patent, copyright, trade secret or other proprietary right arising from the purchase, use or sale of such goods or services; or (3) any leak or spill of any goods while being transported or delivered to Buyer; or (4) any breach by Seller of any term or condition contained in the Order; or (5) violation of applicable laws; or (6) alleged defect in the Goods and/or packaging material, or packed Product, or due to the Goods or packaging thereof being alleged to not adhere to any standard or quality set out herein or under any applicable laws; and/or (7) the acts, omissions, or willful misconduct of Seller's employees and subcontractors, including their agents and representatives, and all other persons performing any services under the Order with the Seller, whether or not caused in part by a party indemnified hereunder. In the event that the goods or services, in Purchaser's reasonable opinion, are likely to infringe a patent or copyright, or misappropriate a trade secret (and in any event, if a court of law finds that the goods or services, in fact, do infringe or misappropriate), then Seller shall further provide Buyer one of the following forms of relief to be chosen by Seller: (a) obtain a license on Buyer's behalf to continue to use or sell the goods or services; (b) redesign the goods or services so that they do not infringe or misappropriate; or (c) refund Buyer the price paid for the goods or services in question. In any and all claims against Buyer by any employee of Seller, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under the Paragraph shall not be limited in any way by any indemnity or limitation on the amount or type of damages, compensation or benefits payable by or for Supplier, any subcontractor, or anyone directly or indirectly employed by any of them under workers' compensation acts, disability benefit acts, or other employee benefit acts.

27. **Confidentiality:** Seller shall keep confidential all specifications and proprietary information furnished by Buyer or prepared by Seller in connection with the performance of the Order (including the existence and terms of the Order) and shall not divulge or use such specifications or information for the benefit of itself or any other party, except as required for the efficient performance of the Order. Upon completion of the Order, Supplier shall make no further use, either directly or indirectly, of any such specifications or information.
28. **Disposal:** If applicable, Seller shall at all times retain title of ownership to any and all materials, substances or chemicals not incorporated into the work that Seller or any subcontractor brings onto Buyer's premises. Seller shall be solely responsible for the handling, transportation and disposal of any and all materials, substances and chemicals. Seller or any subcontractor brings onto Buyer's premises, and any waste generated or resulting from the use thereof. Seller shall not dispose or permit the release of any materials, substance or chemical, or any waste generated or resulting from the use thereof on Buyer's premises. Seller shall handle, transport, and dispose of any and all substances and chemicals, including but not limited to hazardous wastes and substances as defined by applicable federal, state and local laws, rules, regulations, codes and ordinances.
29. **Severability:** If any provision of this Agreement is held to be invalid, illegal or un- enforceable, either in whole or in part, that holding will not affect the validity, legality or enforceability of the remaining provisions of this Order
31. Original Excise Gate pass must accompany each delivery for excisable goods, if applicable.
32. The Seller will not claim without our knowledge any refund from the excise authorities for the amount of Central Excise duty on the supplies made to us. The Seller shall also undertake to refund to the Buyer all money recovered by him from Govt. authorities for which he has been paid by the Buyer.
33. Unless a specific objection to each of the terms of this Purchase order is raised within 24 hours from the date of Purchase order/email under which this PO is sent, it shall be deemed to be accepted in full.
34. Supplier (Seller) Code of Integrity: The Seller/ Supplier agrees to follow code of integrity and code of conduct as prescribed by General Financial Rules 2017.

I. Tender specification

Common Technical Requirements

S.NO		HIGH ENERGY LINAC
1	**EQUIPMENT SPECIFICATION AND STANDARDS**	
2		Linear Accelerator (with 2D, 3D-CRT, IMRT, VMAT, IGRT, SRS, SBRT capabilities)
3	**ENERGY SPECIFICATIONS:**	
4	Photons	**(i)** 6,10 and 15 MV with FF. (Flattening Filter) mode
5		(ii) 6MV and 10MV with FFF (Flattening Filter-Free Mode)
6	Electrons	(i) At least 5 energies between 6 - 15 MeV
7		(ii) Electron energies available for TSET/ HDTSe mode. **Specify** in detail
8	RF power source	Klystron / Magnetron **Specify**
9	Waveguide Type	Standing / Travelling wave **Specify**
10	Target Type & Materials	**Specify** Detail
11	Flattening Filter	**Specify** the flattening filter materials in details
12	Electron Gun	Sealed / Unsealed also mention type of gun **(Specify)**
13	Bending Magnet	Mention Characteristics **(Specify)**
14	Focal Spot	beam focal spot should be less than 3 mm.
15	**TREATMENT MODES:**	
16		Normal - TSD / TAD
17		Rotation: CW/CCW
18		ARC: CW/CCW
19		Dose Rate: MU/degree
20		Research Mode must be ENABLED
21	**PHOTONS / X-RAY BEAM PARAMETERS:**	
22	Dose Rate Specifications	Sustainable high Dose rate will be preferred
23		**(i)** Conventional (FF) mode-Range from **100 to 500 MU/min or mo**re for field size 10 cm X10 cm at depth of the dose maximum for TSD 100cm.
24		**(ii)** High Dose Rate in FFF mode- Minimum of 1000 or more MU/min for 6MV and 2000MU/min or more for 10 MV.
25	Dose rate in Arc mode	It shall have continuously variable dose rate. **Specify** the range in terms of MU/deg

26	Field size	Min. 0.5 cm x 0.5 cm to Max. 40 cm x40 cm or more, at 100 cm TSD.
27	Beam quality	**Specify** the beam penetrative quality parameters for all offered photon beam energies with FF: (i) depth of maximum dose (dmax) (ii) percent depth dose at 10cm depth (D10) or (iii) quality index, TPR 20,10
28		**Specify** the beam penetrative quality parameters for all offered photon beam energies with FFF: (i)depth of maximum dose (dmax) (ii) percent depth dose at 10cm depth (D10) (iii) field intensity at 10cm depth (measurement at three points from the central axis for 10X10 cm2 and 30x30 cm2 or above).
29		**Photon Beam Specifications (As per AERB guidelines)**
30	Beam Flatness	It shall be within ± 3 %. Please **specify** the same for both FF and FFF beams.
31	Beam Symmetry	Shall be within ± 3 %. Please specify the same for both FF and FFF beams.
32	Penumbra	≤ 10 mm for 10 cm x 10 cm field at 10cm depth and SSD 100 cm
33	**ELECTRON BEAM PARAMETERS:**	
34	Dose Rate Specifications	Sustainable high Dose rate will be preferred
35		Minimum 600 MU/min at isocenter or higher for each electron energy. Maximum of the range not less than 1000 MU/min
36		Maximum of the range not less than 2500 MU/min for High dose 6 MeV (electron Energy)
37	Electron Applicator	Minimum four applicators from in range from 5cm x 5cm to 20cmx20cm
38		A method to obtain irregular field shapes should be provided along with beam shaping mould,
39	Electron Beam Quality	**Specify** the electron beam quality specification parameter such as R50 depth of ionization for all offered electron beam
40		**Electron Beam Specifications (As per AERB guidelines)**
41	Beam Flatness	shall not exceed 5%
42	Beam Symmetry	shall not exceed + 3% at gantry angles of 0, 90, 180 and 270 degrees.
43	X-ray Contamination	The x-ray contamination of the electron beam shall be less than 5% of the maximum dose for all electron energies specified above.
44	**DOSE MONITORING SYSTEM:**	
45		Built-in chambers: Independent system of Two or more separate internal ionization chambers with built-in digital electrometer
46		Precision: ± 1% or 1 MU
47		Linearity: ± 1% or 1 MU
48		Reproducibility ± 1% or 1 MU

49		Isocenter: The mechanical and radiation isocenter of the equipment should be less than 1 mm along the x, y and z directions.
50		Dose Rate Dependence: Please Specify
51	**GANTRY:**	
52		Rotation: 360° (± 180 degree)
53		Read Out: Digital and Mechanical (Accuracy digital readout 0.5°)
54		Control: Control-console and hand pendants
55		Target-Axis Distance: 100 ± 0.2 cm
56		Optical Distance Indicator (ODI) Range: 75 cm to 150 cm
57		ODI Accuracy: ± 0.1 cm
58		Rotation iso-center accuracy: within 2 mm diameter sphere
59		Isocenter height: Less than ≤130 cm from finished floor
60	**TREATMENT HEAD:**	
61		Distance between isocenter and lower collimator shall be ≥ 40 cm
62		Distance between bottom of blocking tray and isocenter shall be > 30 cm
63		A complete set of pre shaped beam blocks shall be provided.
64	**COLLIMATOR**	
65		Rotation: ± 95° about mid position
66		Control: Hand pendent and control- console
67		Read out Digital: +- 0.5 °
68		Rotation iso-center accuracy: within 2 mm diameter sphere
69		Dynamic / Motorized / Virtual Wedge
70		Asymmetry: X & Y both Asymmetrical, Treatment Delivery with Dynamic Jaw Tracking. Please Specify. Travel ranges & over travel range. Please specify
71		Light / Radiation Field coincidence: ≤ 2mm
72	**MULTI-LEAF COLLIMATOR**	
73		An Integrated multi-leaf collimator (MLC) leaves shall be at least 60 pairs or more to provide maximum field size of 40 cm x40 cm (Specify independent drives for each leaf)
74		The MLC leaf width resolution of not more than 5 mm at the isocenter across the field size.
75		Specify all other physical characteristic parameters of the offered MLC
76		The MLC interleaf leakage shall be less than 4% and the leaf position accuracy less than or equal to 1 mm at the isocenter plane.
77		Dynamic Conformal therapy procedures: Enabled
78		Dose delivery system dynamic
79		The vendor shall provide compatible interface between MLC and the application system used for execution of treatment delivery.
80		Auto Field Sequencing (AFS): should be available
81		Capable of performing Conformal therapy (IMRT, Rotational IMRT, SRT, SBRT) procedures.
82		Facility to treat patients conventionally, using blocks without MLC. Please specify
83		Work Station HW/SW – Please Specify details
84		Capable of Integration (full Networking) with existing Planning System and existing CT Simulators.
85		IGRT delivery please specify

86		SPECIFY FOLLOWING PARAMETERS:
87		Max. leaf retracting position
88		Over travel (jaws)
89		Over center travel of MLC leaves (≥10 cm) for IMRT treatments
90		Max. field length
91		Leaf height & material.
92		Coincidence of light & x-ray field
93		Penumbra
94		Transmission
95		Interleaf leakage
96		Leaf position accuracy
97		Max. carriage speed
98		Max. leaf speed
99		Positional accuracy of the leaves during treatment.
100		Inter-digitation of leaves if available
101	**LEAKAGE RADIATION AS PER IEC/AERB STANDARD**	
102		Head leakage. Please specify.
103		Collimator transmission. Please specify.
104		Neutron Dose: Please specify
105	**TREATMENT CONSOLE**	
106		Fully computerized with 21/23" color LED monitor(s), printer etc.
107		**Display Features:** Power OFF/ ON, Total Dose, Set-time, MU/deg, Mode-selection, Radiation-ON, Interrupt, Complete Arc-therapy, Wedge and Port-film, etc.
108		All Digital-scales for gantry, collimator and couch motions, as well as digital display of the patient set-up provided in the treatment room has to be displayed at operator console.
109		**Adjustments from Control console**: Dose rate, System calibration and servicing, Event logging, Gantry angle and Collimator size etc.
110	**IGRT SYSTEM**	
111	KV Imaging system	KV based image guidance system with control console should be provided
112		Specify the KV generator KV, MAs and exposure time ranges and their accuracy.
113		Specify the KV x-ray tube source/focal spot size, collimation minimum and maximum field sizes, maximum anode heat capacity and heat dissipation rate etc.
114		Specify CBCT imaging FOV, HU accuracy and uniformity, spatial resolution, low contrast resolution and slice thickness range as available Necessary IGRT commissioning and quality assurance phantoms for HU water and flex map calibration, image quality phantom, CBCT electron density phantom shall be provided.
115		Retractable arms
116		System shall have an integrated amorphous silicon based flat panel detector and kilovoltage (KV) X-ray source tube for generating radiographic, fluoroscopic and 3D and 4D cone beam computed tomography (CBCT) imaging for 2D,3D and 4D IGRT treatment verification with 3D and 6D correction strategies.

117		The quality of image, especially axial CT images from the CBCT should be sufficient to delineate target and critical structure volumes.
118		All Advanced image registration software commercially available should be supplied and should be able to overlay original reference images from the TPS to the on-board images and calculate offset values based on user defined reference points and structures. The software should be able to move the table as per the offset values in 3D and 6D.
119		Flat panel detectors of min 40 X 30 Cm or more, with Pixel Matrix of min 1024 X 1024 or more. Please specify.
120		CBCT reconstruction, registration (MV-MV, KV-KV, KV-MV), Pl specify the analytical tools
121		System shall be capable of acquiring images such as 3DCBCT, pretreatment inter-fraction 4D-CBCT, intrafraction 4D-CBCT or Triggered imaging, Gated CBCT(Automatic/Manual)
122		3D image data should be reconstructed from series of 2D projection images acquired as the linear accelerator gantry is rotated, please specify all acquisition & review modes with ONLINE GATED CBCT or Manually Gated CBCT, 4D-CBCT with Reconstruction.
123		System shall be capable of performing reconstruction methods of either feldkamp back projection (FDK) algorithm and/or iterative algorithm.
124		System shall be capable of manual registration, automated bone registration, automated soft tissue registration or gray value-based registration methods.
125		All Advanced image registration methods such as region of interest registration, deformable image registration if commercially available shall be provided.
126		Fully integrated with latest R & V system and TPS, pl specify the report generation tools
127	Adaptive radiotherapy	Please specify latest modes of approaches towards acquisition, registration, review, dose reconstruction etc. along with Deformable Image Registration software. Dose Accumulation, Dose calculation on deformed images and Adaptation should be available.
128		The offered 3DCBCT image quality should be sufficient to delineate target and critical structure volumes for adaptive planning dose calculations
129		System shall be able to transfer images to (from) EPID/CBCT from (to) treatment planning system (TPS).
130	Portal Imaging	ln-room image Guidance System (Electronic Portal imaging System)
131		Should fully integrate with Accelerator
132		Should be able to take images at any Gantry angles with variable X-Y/Z movements
133		Imaging area should be 40 x 30 cm2 with energy range 4-25 MV
134		Should have latest Digital technology with High Resolution Imaging (Amorphous silicon (a-Si) flat panel technology)- please specify
135		The system shall provide a suitable means to import & export images for verification and display on the same workstations; to acquire & transfer images through the existing oncology network; and to be capable of registration
136		Vendor shall provide features on image processing, image display, image analysis, image storage, image print and image enlargement. Details shall be stated.
137		Avoidance of irradiation of area outside sensitive detector panel and anti-collision device, vendor shall state and provide details including the usable life span of the EPID.
138		Vendor shall provide all accessories including necessary QA tools, maintenance tools etc. for EPID.
139		Provision of facilities for storage / archival of electronic portal images.

140		Portal images can be exported to external facilities in a recognized format including BMP and TIFF.
141		Vendor should provide IMRT and VMAT portal dosimetry verification system of EPID for all available energies including FFF beams.
142		There shall be a geometric calibration phantom for kV to MV isocenter alignment and other calibration.
143		Image quality phantom to determine the low contrast and spatial resolution shall be provided
144		IGRT daily QA phantom for kV and MV projection imaging and kV CBCT checks and dynamic thorax phantom for validation of 4DCBCT imaging along with mechanically independent of platform motion and programmable through motion control software and all other necessary IGRT QA tools shall be provided.
145		The vendor should provide CBCT Electron density and image quality phantom specifically designed for CBCT with increased HU value for adaptive radiotherapy commissioning and QA of CBCT image quality.
146	**TREATMENT TABLE /COUCH SYSTEM:**	
147		A treatment table/couch with motorized lateral, longitudinal and vertical movements with is centric table rotation up to ±90° shall be possible.
148		Treatment couch with 6 degree-of-freedom (6DOF) in translational and rotational movements capability and accessories used for image guided radiation therapy shall be provided.
149		The table top shall be of carbon fiber, free of metal or other radio-opaque materials.
150		The couch top shall be indexed to allow reproducible placement of immobilization equipment and also to provide interface for mounting the quality assurance equipment at the head of the couch.
151		The lateral range of the couch shall be at least ±20 cm. The longitudinal range of the couch shall be greater than 70 cm. The vertical motion of the couch shall range from the isocenter to at least 57 cm below the isocenter.
152		The sag of the couch top shall be less than 5 mm with a patient of 80 kg weight. The couch shall be able to take a maximum weight of at least 200 kg.
153		Provision to compensate for the rotational error during patient setup.
154		It should have the capability for remote controlled robotic positional correction facility in three translational and three rotational axes with respect to the 6D shifts derived from the integrated to KV cone beam CT and Orthogonal KV images acquisition system.
155		Electrical backup in service mode & Mechanical Control (in case of power failure). Please specify
156		Minimum height from floor - specify
157		The offered system should facilitate the automated treatment couch adjustments based on treatment planning data for automatic patient setup process in single button click
158	**PATIENT ALIGNMENT LASER SYSTEM:**	
159		Green/Red, remote controlled, fixed lasers mounted on the treatment room walls having two lateral cross lasers, one ceiling cross laser and one sagittal line lasers shall be provided.
160		A separate back pointer laser alignment system shall be provided and installed onto the linear accelerator.
161		All laser products shall comply with respective code of IEC safety of laser products.
162	**ACCESSORIES:**	

163	Wedge System	System shall be equipped with dynamic/motorized wedges providing wedge angles up to 60°. Along with dynamic/motorized wedges, physical wedge (if possible) will be appreciated. Interlocks shall be provided so that the operator has to positively confirm that the correct wedge has been selected. Specify the maximum possible wedged field size.
164	Front pointer	Digital and/or Mechanical
165	Accessory mount	shadow block and electron tray
166		One Set each of Divergent blocks
167	Laser Alignment System	(3 cross and one Sagittal) Green/red laser system (as mentioned above)
168	Portable Hard Disk	Two (2) nos. of 1TB each, for patient data backup.
169	UPS	Suitable UPS required to run the machine with 30 min back up
170	Chiller	Suitable Chiller required to run the machine.
171		Last Man Out Switch
172		In-room Color flat Monitor LED 24" or higher
173		Manual retraction tool (manual crank) for couch in case of power failure
174		CCTV Camera. Remote controlled with remote zoom & focus facility.
175		Two-way audio communication system
176		Fully functional Hand pendent
177	**2D, 3DCRT:**	
178		The machine shall be capable of delivering 2D treatment with open, rectangular fields, where the field size and beam angle can be determined at the time of treatment delivery, inside the treatment Ability to perform standard 3D conformal radiotherapy treatments
179	**INTENSITY MODULATED RADIATION THERAPY & VOLUMETRIC MODULATED RADIATION THERAPY SYSTEM**	
180		The linear accelerator system shall be capable of delivering Intensity (fluence) modulated photon beam within and across the given field apertures in order to produce highly conforming dose distribution as per the physician prescription.
181		Bi-directional arc therapy should be included with Automatic calculation of Dose per degree based on the Dose Rate selected and the Arc angle set.
182		Support for "step and shoot" IMRT and/or dynamic sliding window" IMRT delivery
183		Specify the LINAC performance for small MU delivery
184		Capable of delivering high quality intensity modulated fields using fractions of MU (please state minimum MU per segment)
185		Extended intensity modulated field size shall be at least 30 cm x 30 cm
186		Capable of automated delivery of multiple co-planar fields in sequence from the console with remote control of gantry, collimator and jaws motions between co-planar treatment fields.
187		Capable of verifying every parameter of segments downloaded from treatment planning systems through network for IMRT treatment

188		The latest technology for faster implementation of IMRT such as Volumetric Intensity Modulated Arc Therapy (VIMAT) or its equivalent should be provided.
189		Based on the comparison of initial planning images and on-board images, change in treatment plan should be possible.
190		The system should have latest configuration of hardware (CPU, hard drive, RAM, min 21" square TFT monitor, color LASER printer)
191	**FOUR-DIMENSIONAL SURFACE GUIDED RADIATION THERAPY (SGRT)**	
192		The vendor should provide advanced and latest model of gating solutions for entire four-dimensional (4D) treatment chain from imaging (4DCT) to (4D) treatment delivery. The system should consist of 4DCT acquisition and Gating Systems with following features: -
193		The system should support patient positioning, intrafraction motion tracking and respiratory gating workflows
194		The system should facilitate the 4D treatment of thoracic and abdominal tumors.
195		The system should have advanced algorithms for rigid/deformable models to enable real time assessment of patient positioning errors before and during treatment delivery.
196		The system should check the patient position more than once every second using a three-camera system with at least 2 MP resolution to ensure sub millimeter accuracy
197		The system should have provision for audio-visual coaching apparatus to detect the deviation outside the set tolerance which also helps the patient to follow optimal breathing pattern.
198		The system should support for 4D CT imaging acquisition and should be installed both in the CT room and also the treatment room.
199		The gating system should be capable of prospectively gated and retrospectively gated imaging and treatment delivery. Real-time 6-DOF isocenter monitoring-cum-gating should be available
200		All necessary phantoms and QA systems/tools/gadgets required for Commissioning and validation tests for clinical implementation of above systems should be provided.
201		The vendor should provide latest model of the stand-alone deformable image registration system with following features;
202		System should be capable of performing deformable image registration using CT/MRI/PET/SPECT images and should be provided with all commercially available deformable algorithms.
203		Treatment Delivery Techniques
204	**TOTAL BODY IRRADIATION:**	
205		Total Body irradiation: The machine shall be capable of delivering photon beam with total body irradiation (TBI) mode and vendor shall provide necessary accessories (like TBI stand/frame, beam spoiler/degrader. Shielding blocks for kidney, lung, eyes, gonads for delivering TBI treatment
206	**ELECTRON BEAM THERAPY:**	
207		The machine shall be capable of delivering electron beam treatment for superficial tumors.
208	Total Skin Electron Therapy:	The offered LINAC shall be able to deliver total skin electron therapy (TSET). Necessary energy degrader system and other accessories shall be provided
209	**SAFETY FEATURES**	

210		Radiation Safety Features: The following radiation safety features shall be provided:
		Facility access interlocks.
211		Emergency-off buttons in the treatment room and control room.
212		Various beam off interlocks. Please Specify
213	**TREATMENT PLANNING SYSTEM**	
214		The treatment planning system (TPS) shall be capable of performing conventional conformal 3D-planning, inverse treatment planning for IMRT and VMAT, 4D treatment planning and adaptive treatment planning for clinical application of various standard and advanced treatment delivery techniques in radiotherapy. The TPS shall have modules of (i) Image import and registration (ii) Contouring (segmentation) tools for tumor volumes and organs at risk (iii) Treatment planning environment, including 3D patient image and dose distribution display; (iv) Plan review module, including dose statistics calculation and tabulation (v) Plan preparation and export module (vi) Dose calculation algorithm and beam modelling module.
215		The TPS shall be supplied with dedicated hardware, including workstation, monitors and printer.
216		Capable of doing 3DCRT, IMRT, IGRT, VMAT, SRS, SRT and 4D planning
217		CT/MRI/PET-CT fusion facility
218		Auto contouring option should be available
219		DICOM connecting networking system between TPS, LINAC and CT simulator
220		System should be capable of performing Auto contouring and Atlas based segmentation for Adaptive re-planning.
221		System should be capable of Adaptive re-planning inter-fraction Dose Accumulation.
222		System should be capable of template-based planning/knowledge- based planning
223		System should support for DICOM /DICOM RT Import: CT, CBCT, PET CT, PET, MR, SPECT and diffusion weighted MRI (DWI), including cine/4D modes for all relevant imaging types.
224		System should support for DICOM / DICOM RT export: all meta-data and imaging data (including structure sets, treatment plans with doses) must be exportable in a DICOM-readable format along with deformations, either as deformable vector fields (DVF) or as resample deformed DICOM images or as resample deformed DICOM images or as DICOM image with deformed contours
225		System should have tools to generate maximum intensity projection, minimum intensity projection, average projection, mid-ventilation position reconstruction from 4D-scans.
226		System should be capable of performing 4D dose accumulations over all phases of respiration for evaluating the actual dose delivered to moving target.
227		Should have tools to reduce artifacts/noise from the images, e.g. attenuation correction, HU replacement in a user contoured or automatically defined area.
228		It should have Biological Optimization solutions (EUD or TCP or NTCP etc.).
229	The TPS shall include:	Two (2) treatment planning workstations with dose calculation licenses and three (3) virtual simulation workstations without dose calculation licenses shall be provided. All the contouring workstations should have medical grade monitors of minimum 2 mega pixels or more

230		The system shall have latest technology of hardware and software features commercially available at the time of delivery.
231		Treatment planning workstations, including 23-inch or above medical grade monitors printer, keyboard, mouse with network capability
232		Display of all relevant planning and treatment system parameters shall be in accordance with the IEC 61217 scale and coordinate convention.
233		For the purpose of additional requirements in near future, the vendor shall provide the price for each unit for additional TPS and Contouring workstations offered which should be valid for up to two years. The same will not be considered for pricing ranking.
234	Imaging and Image registration	System shall enable import of patient data sets from various imaging modalities that are used to facilitate target definition using the DICOM standard.
235		Image import shall be achieved through direct connectivity and also provision to be used through CD/DVD media.
236		The Networking with picture archiving and communication system (PACS) system
237		System shall support for CT, MRI, CBCT, and PET registration.
238		System shall use both rigid and deformable image registration
239		Specify the type of DIR methods available in the offered system.
240		Deformable image registration shall be capable of fusing CT and CBCT images.
241		Contouring/ Segmentation Contouring tools shall allow the definition in 3D of structures, including target, organs at risk and patient outline.
242		Automated tools shall allow the expansion of the clinical target volume (CTV) to a planning target volume (PTV) with non-uniform margins in three dimensions.
243		System shall have ability to add bolus structures to the patient data set of various shape and density.
244		System shall be capable of 3D visualization of patient data display, beam display and dose distribution display.
245	Contouring and segmentation	System shall have the following advanced contouring and segmentation functionalities:
246		a) Multi-modality contouring
247		b) 4D image dataset support- MIP, AIP, and minIP image creation
248		c) Auto PET SUV contouring
249		d) Advanced Boolean operations
250	Planning, Optimization and Dose Calculation	The offered system shall have the following basic and advanced planning and optimization functionalities:
251		i) A comprehensive “forward planning” environment shall allow the user to modify beam weights, beam positioning, jaw position, wedges and blocks, or MLC to optimize the treatment plan.
252		ii) 3D, electron planning and composite planning
253		iii) Field-in-field forward IMRT planning

254		iv) Static and dynamic IMRT and VMAT planning
255		v) Stereotactic Treatment planning
256		vi) 4D treatment planning
257		vii) Physical DVH based and biological optimization methods.
258		viii) Advanced and latest version of planning algorithms
259		ix) The dose calculation grid shall be user adjustable for desired, better dose calculations accuracy.
260		x) Photon beam and electron beam algorithms shall calculate the dose to the patient considering the 3D nature and heterogeneity of the patient data set.
261	Plan review and approval:	i) System shall have basic and advanced plan review and evaluation tools such as dose volume histograms (DVHs), dose statistics, 2D and3D dose visualization, and plan addition and plan comparison.
262		ii) System shall also have the Radiobiological model-based treatment response evaluation tools such as BED/EQD or TCP and NTCP or physical-based models such as DVH, dose-volume based tools
263		iii) System shall be able to generate, view and transfer DRRs
264		iv)User and password security shall allow approval/locking of treatment plans and different levels of access to the functionality of the TPS based on the user's profile, e.g. administrator, planner, medical physicist, radiation oncologist.
265		v) Shall be possible for electronic/auto plan approval, if commercially available
266	Beam Modelling:	i) Comprehensive beam modelling module shall allow the configuration of complete geometric and dosimetric models for treatment unit with photon and electron beams.
267		ii) The module shall have the following features:
268		1. Ability to import measured beam profiles and output factors.
269		2. Ability to model dynamic, fixed and internal wedges.
270		3. Tools to allow the comparison of the beam model and measured data.
271		iii) Security features that protect beam data and beam models from modification.
272		iv) A module shall allow the creation of CT number to mass density or electron density data for various CT scanners for use by the photon and electron beam algorithms.
273	Plan output and network connectivity	i) A laser printer for A3/A4 output of isodose distributions, beam shapes and treatment plan parameters shall be provided.
274		ii) System shall allow export of beam block shapes to a third- party block cutting device.
275		iii) System shall allow export of approved treatment plans and DRRs to an oncology information system (OIS).
276		iv) System shall haveHL-7 and IHE-RO compliant capability.
277		Networking with TPS: All the software with licenses required should be included.
278		Complete DICOM-RT export/import license should be available.
279	**ONCOLOGY INFORMATION AND IMAGE MANAGEMENT / TREATMENT RECORD AND VERIFY SYSTEM:**	
280		The oncology information system (OIS) is a software application that manages the workflow and storage the electronic information, including patient data in the radiation oncology department
281		Three (3) OIS workstations with concurrent licenses shall be provided.

282		The system shall have latest technology of hardware and software features having vendor recommended specification of the system commercially available at the time of delivery, not minimum specification.
283		Transfer of DRR images from TPS to portal imaging system for comparison
284		Transfer and execution of MLC position parameters for normal treatment and IMRT treatment including step & shoot & sliding window (dynamic) techniques from treatment planning system
285		Transfer & Execution of Conformal, IMRT, VMAT, SRS and SRT treatment plans from Treatment Planning System should be provided.
286	The OIS should be able to use as	(i) record and verify system
287		(ii) to transfer treatment plan information and images from the TPS to the treatment unit
288		(iii) to record detailed dose delivery information and images for each treatment session
289		(iv) image review module
290		(v) manage the patient care pathway
291		(vi) electronic patient record and manage staff workflow through defined tasks
292		(vii) treatment unit schedules and appointments.
293	**GENERAL REQUIREMENTS**	
294		The offered OIS shall be compatible with OIS, LINAC and TPS in the radiation oncology department. The OIS, KV, MV, TPS should be integrated for a seamless workflow.
295		OIS shall be interfaceable with the hospital EMR/HIS using HL7/ FHIR standards
296		The software should also be compliant with the requirements of the National Health stack and should have undergone ABDM sandbox testing if indicated in the NHA guidelines.
297		The system shall be capable of integrating with CT Simulator, MRI, PET and linear accelerators, treatment planning system, dosimetry equipment and hospital PACS. The specifications for network to be provided by the vendor.
298		The OIS shall use the DICOM RT standard for transfer of radiation oncology specific electronic information and shall comply with IEC standards.
299		The OIS shall include a secure, remote servers and workstations at least 23-inch monitors, Color printer, keyboard, mouse with network capability.
300		An UPS to be provided to the TPS to prevent loss of planning data in case of power failure
301		The offered system shall have the following technical specifications.
302		OIS workstations shall be capable of:
303		Manual data entry of 2D cases, clinical mark-ups and emergencies.
304		Approval and entry of prescriptions and free text setup instructions.
305		Upload of photographic images.
306		Electronic chart checks.
307		Image review of DRRs and treatment images (portal and setup)
308		Networking to the TPS to allow import of the patient administration data, beam delivery parameters and DRRs of graphically planned patients.

309		The importation of data should be customized to correctly download and translate the TPS information to the scales and graduations of the department treatment units.
310		Workstation and software for Offline image review to be provided
311		The workstations should include an in-room alternative monitor to facilitate patient identification and viewing of the setup instructions, including digital images.
312		The LINAC system should be supported by a local UPS with the minimum of 30 minutes backup such that there is no interruption to the on-going treatment delivery in the event of a power failure.
313		Latest HW/SW, upgradable for next 10 yrs.
314		DICOM3 and full DICOM family
315		DICOM RT Import/export from all existing CT/MR/PET/PACS/etc.
316		Multi-modality (CT, MR, PET etc.) Image registration (rigid and deformable). Pl specify the solutions.
317		Exit Dosimetry-Integrated Exit dosimetry/Portal dosimetry feature, please specify details for all available energies
318	**SOFTWARE SHALL HAVE THE FURTHER FOLLOWING FUNCTIONALITIES**	
319		Hierarchical security features, including requirement for authorized approval of the dose prescription and field parameters prior to treatment.
320		Complete log of activities and users.
321		Generation of statistical data according to user-defined fields, e.g. diagnosis and managing consultant.
322		Library of diagnoses according to the WHO International classification of diseases, (ICD-10).
323		Ability to correctly log cumulative dose in the event of a treatment interruption or termination.
324		Patient appointment scheduling.
325	**SERVER**	
326		Advanced Server (Minimum 10 TB SSD Server on a single/two server/s) capable for connecting a minimum of two linear accelerators, 6D Robotic couch, treatment planning systems and workstation for contouring, OIS etc. (safe and secured backup/restore) – latest HW/SW and upgradable for next 10 yrs.
327		All necessary licenses to be provided for above all mentioned where relevant

S.NO	TENDER SPECIFICATIONS OF MR LINAC
1	**GENERAL**
2	The quoted model should be Type Approved by AERB.
3	The bidder should have direct operations in India, Company owned service centers should be available in India.
4	Ware house for spare parts should be available in India.
5	Company employed trained service engineer for both LINAC & MRI should be posted in India.
6	**TECHNICAL**
7	Digital Linear Accelerator with Integrated High-Field 1.5 Tesla or more Superconductive MRI System mounted on a single platform, having continuous 360° rotation around the MRI.

8	MR Integrated Linear Accelerator must have the latest FULLY INTEGRATED technology and should be fully computer- controlled with the latest state of the art digital control system. The offered system should be designed to combine state-of-the-art MR and LINAC technology without compromising either system (For Real-time Imaging while delivering Radiation Dose).
9	The combination of two sophisticated technologies high field with at least 1.5T MRI scanner providing higher signal- to-noise-ratio (SNR), with better contrast and fast image acquisition times and minimum 6 MV linear accelerator.
10	A powerful tool in shape of online dose re-planning software enhances the ability to re-shape the treatment dose on the go while the tumor changes the shape, size and position.
11	**MR LINAC PARAMETERS**
12	Digital LINAC
13	Minimum of leaves 120
14	Energy (MV) Minimum 6 MV or high FFF beam
15	Leaf Speed 5 cm / sec or better
16	Diaphragm Speed 6 cm / sec or better to provide the plan optimizer maximum flexibility to define the field across the leaves.
17	Gantry Speed 6 RPM or better
18	Field Size Minimum 22 x 55cm
19	SSD Minimum 130cm or above
20	**MRI SYSTEM PARAMETERS**
21	Magnetic Field 1.5 Tesla or more
22	Type Superconductive
23	Patient Bore 70cm or more
24	Bore Length 172cm or shorter
25	Stroke Length 290 cm or more
26	Table Top (Height) 40 – 85 cm or better
27	Maximum Load 225Kg or more
28	Magnet Shielding: Active
29	Field Width 57cm or more
30	System should have head- or feet- first positioning to ease patient anxiety.
31	Imaging protocols should be dedicated for MR/RT purposes
32	It should have a patient friendly ultra-short magnet bore that will be preferred by claustrophobic patients.
33	MRI receive-coil solution should be specifically developed for low attenuation of the beam: One posterior coil in a fixed position at the magnet iso-center and one anterior coil in an indexed sliding frame with flexibility in how to be positioned.
34	MR System should provide real-time imaging in up to three orthogonal planes for continuous visualization.
35	The offered system should have dedicated MR imaging console for advanced MR sequences.
36	It should provide 1.5T diagnostic grade Diffusion-weighted imaging (DWI) protocols with ability to perform volumetric DWI.
37	Signal to noise ratio (SNR) should be stated.
38	Spatial accuracy should be stated.
39	Imported RF Cage (tailor-made) as per the requirements of the room/site.

40	Means to reduce time taken for sequences without impacting image quality should be provided
41	**PATIENT POSITIONING SYSTEM**
42	The system should comprise on Flat Tabletop with comfortable mattress
43	Patient headphones and call bulb
44	**PATIENT POSITIONING PACKAGE**
45	The Patient Positioning Package should contain all the necessary components to generate individual patient set-ups for a wide range of anatomical sites.
46	Headrest for Patient comfort and support.
47	Wing Board Indexed base plate with two arm support and two wrist supports, headrest for patient comfort and support.
48	Knee Board Indexed Knee or Ankle Support
49	Knee Elevation Used to increase the height of the Knee
50	Feet Board Indexed Support for Feet
51	Prone Position Pillow Allows patients to be scanned/treated in a prone position.
52	Headrest Indexing Adapter Headrest adaptor which allows headrest position pillow to be indexed to couch.
53	Handgrip Reduces the risk of induction loops during MR Imaging.
54	Armrest Providing support for the arms.
55	**QUALITY ASSURANCE TOOLS**
56	The dedicated MR-Integrated Linear Accelerator QA tools should comprise on:
57	1. QA platform and inter-changeable interface plates
58	2. MV alignment phantom
59	3. MR to MV alignment phantom and supporting software
60	4. MR Head phantom and supporting software
61	5. 3D Geometric phantom.
62	6. Hardware supporting the integrated software solution
63	7. Patient experience solutions – mood lighting – in bore lighting solutions
64	8. Patient Setup Tools
65	9. CCTV and Intercom Solution
66	**TREATMENT PLANNING SYSTEM**
67	Treatment Planning System must have GPU based calculation algorithm and include Particle Transport Algorithm (PTA) which allows modelling of the beam path in a magnetic environment.
68	The online plan adaptation module should support responsive online adaptive workflows to allow for position and shape adaptation, different levels of treatment planning from warm start optimization to full Monte Carlo re- planning, online dose calculation engine using latest Particle- Quantity 1
69	Transport Algorithm to fully model the magnetic environment, cryostat, RF coils and table.
70	The offline Treatment Planning System workstation package should support delineation activities, reference plan planning and plan reviews- Quantity 1
71	Additional Contouring software License with Hardware must be supplied with the Treatment planning system- Quantity 2
72	Note: During the implementation phase, supplier should provide the customer Physical Support & Services in order to speed up and streamline the ramp up to clinical go live.
73	**QUALITY ASSURANCE MANAGEMENT SYSTEM**

74	QA management system designed to integrate devices such as treatment delivery, imaging and quality assurance equipment in routine use within today's radiation therapy departments, irrespective of vendor, should be offered for:
75	· Linear Accelerators
76	· Quality Assurance Equipment
77	· CT Simulator
78	· MR Simulator
79	QA System should provide a web-based database workstation for easy monitoring and maintenance of all machine QA processes across the clinic, or multiple sites, allowing centralized data management and remote access.
80	**ONCOLOGY INFORMATION SYSTEM**
82	Connectivity to the Oncology information system must be provided with the system to maintain complete patient database including all images as well as treatment record and verification. It must include at least 03 workstations. Oncology information system should be interfaceable with the hospital EMR/HIS using HL7/ FHIR standards
83	The software should also be compliant with the requirements of the National Health stack and should have undergone ABDM sandbox testing if indicated in the NHA guidelines.
84	**DOSIMETRY SYSTEM**
85	Required dosimetry system to be offered for the MR -LINAC
86	**WATER PHANTOM**
87	The Radiotherapy Water Phantom system shall be dedicated for extensive 3-D radiation beam scanning and analysis. It shall be used for testing, commissioning, acceptance and regular Quality Assurance (QA) schedules of the Linear Accelerators.
88	Necessary build-up caps to be quoted for the offered cylindrical chambers for in air measurements.
89	**PATIENT SPECIFIC QA**
90	A state- of- art Ion Chamber/diode-based array detector along with necessary phantom for complete verification of IMRT and VMAT/Rapid Arc plans must be offered.
91	Necessary software with license must be provided
92	**ABSOLUTE DOSIMETRY SYSTEM**
93	A small size water phantom with dimension of 30x30x30 cm3 must be provided for absolute dosimetry in photon beam with vertical beam incidence. There should a chamber adaptor to mount Farmer Type chamber at a fixed distance. The phantom should have adjustable supports for levelling, etched cross hairs for alignment and a collision protected drain tap for emptying without tilting or changing the phantom's position.
94	A 0.6 cc waterproof Farmer type chamber should be supplied for absolute dosimetry of photons along with electrometer. The chamber should be supplied with Absolute Dose to Water calibration factor.
95	One Triaxial Cable having minimum 18 mtr. length for connecting the chamber to the electrometer to be offered.
96	A water equivalent solid phantom of different thickness must be provided for absolute measurements in photon and electron beams in external beam therapy. The phantom should be of 30 x 30 cm size consisting of various thickness so as to achieve any thickness with 1mm resolution up to 30cm. All these slabs must be precisely machined to ensure free of contaminants and air bubbles. Necessary chamber adapter plates for the offered chamber should be provided
97	A precise Calibrated barometer and Calibrated thermometer must be supplied for air density correction.
98	A Micro diamond detector should be provided.

99	**DAILY QA CHECK DEVICE**
100	A QA device to perform daily and routine QA of the LINAC as per TG recommendations should be provided, which can perform constancy checks on MR LINAC to check homogeneity, symmetry, central dose needs to be supplied with option to analyse the data. If the Patient QA Array Device can be used for both Patient and Machine QA, the same can be offered.
101	The device should be capable of printing the daily data for selective period, selective energy, field size and any other filter options. There should be options to print the trend analysis in graphical format, along with the summary for the chosen period. It is also desirable to print the analysis of the daily data for the selected period. The actual measurements of the chambers should also be pintable in table format.
102	The device should have a capability to store up to 8000 number of measurements in PC.
103	Dedicated software should be provided for data documentation and trend analysis.
104	A Laptop should be supplied for use of all application software offered. The latest version of operating system, Professional laptop (with higher version processor, 8GB RAM, 1TB hard disk, 2GB graphics card) should have all the latest feature with colour FULL HD monitor and with printer/plotter (colour). The system should be upgradable
105	**OTHERS**
106	Online Pure Sinewave Double Conversion at least 160KVA UPS with 8-10 minutes backup.
107	The quoted system must have at least 2 of the following quality & safety certifications:1. FDA / CE / MHLW
108	MR LINAC Bunker interior design and standardization should be offered as a standard feature
109	All necessary licenses to be provided for above all mentioned where relevant

S.NO	HDR BRACHY THERAPY MACHINE
1	**GENERAL SPECIFICATIONS:**
2	A high dose rate remote after loading Co-60 Brachy therapy system capable of Intracavitary, Intraluminal, Interstitial, surface mould radiation therapy.
3	The HDR system should be microprocessor based with PC controlled.
4	The HDR unit must be from a well-established company with a documented history of reliability.
5	The HDR system manufactures should have ISO / FDA / CE / Type approval from AERB. The copy of certificate should be enclosed
6	The system needs to be flexible for use in thinner implants
7	A single operated quick lock system shall be provided to secure the unit in position when parked or during treatment.
8	The HDR system must have a “Check” cable that automatically checks the operation of the complete prior to treatment. The check cable must also be possible to use as a “Dummy” source to allow simulation a particular source location.
9	All the AERB specified radiation safety features in the control unit and in the room should be available
10	The HDR Unit quoted in the tender shall have type approval certificate from the competent authority. A copy of type approval of the same must be enclosed with the offer.
11	**DETAILED SPECIFICATIONS TREATMENT UNIT:**

12	High dose rate brachytherapy unit capable of intracavitary, interstitial, intraluminal and surface mould radiation therapy.
13	Unit should be on wheels for easy mobility
14	Separate stepper motors to control the check cable and source cable
15	Equipment should have Integrated radiation detector to confirm source return.
16	The maximum source holding capacity without exceeding AERB specified air kerma rate at a distance 1 meter from the surface of the after loader and on the surface of after loader should be specified
17	Multichannel indexer with a minimum of 20 PHYSICAL channels or more having an automatic/optical verification of channel number and applicator connection.
18	The source must be retractable in the event of an emergency / power failure by an independent DC motor or manual source retraction through hand crank.
19	Equipment should have additional battery powered DC motor source retraction system as back up for source return security.
20	UPS back up for at least 30 min should be provided separately for HDR Brachytherapy Machine, control unit and in the TPS.
21	Battery backup and a detailed circuit for checking the battery condition.
22	Start enable switch (Last Man Out)
23	Transport Container
24	Emergency Container
25	Patient couch (OT table & trolley with necessary accessories for treatment: Please specify details. Mention separately for imported and indigenous couch.
26	All Transfer tubes should be of standard length for ease of use.
27	**CONTROL UNIT:**
28	High resolution minimum 21inch TFT/LCD/LED display with CPU, keyboard, mouse, printer etc.
29	Network facility to treatment planning system
30	Control unit should be of user-friendly console and a graphical user interface and should contain an extensive reporting facility.
31	Control Unit Software Should Run on Windows Application.
32	Control Unit should have a self-testing including battery, indexer / RAM.
33	Control unit must allow storage of multiple standards and keep track of patients for fractionated treatment.
34	Access to authorized user with password protection
35	The treatment times must be automatically corrected for the decay of the source.
36	Treatment length must cover 40cm or more with a corresponding 1mm step source size with accuracy of +/- 0.5 mm or better.
37	There should at least be 100 dwell positions for the source in each channel.
38	Dwell position display

39	Dwell time display- please specify range
40	Display Window should show step position and corresponding dwell time to 0.1 sec.
41	Display of indexer length, activity and dose
42	Display of Total reference Air Kerma and dose.
43	The HDR should have daily Q. A. Customer Q.A test plans, individual checklists and documentation, reminder function.
44	All required QA and Dosimetry items like well type chamber, electrometer along with cable, gamma Zone monitor, source position check ruler, source position simulator, contamination monitor and Survey meter etc. must be supplied by supplier as per radiation safety guide lines.
45	The source position accuracy check shall be enabled with a stepping source viewer and a camera connected to a TV system/ Control Computer.
46	Source position adjustable by user (+/- 2mm). Using the source alignment, you can achieve a dwell position.
47	The HDR should have integrated solution for source and dummy calibration.
48	HDR should have digital source position verification and adjustment system
49	The HDR with Automatic/Manual length measurement
50	The safety systems of the unit shall be integrated into the existing safety infrastructure (e.g. door interlocks)
51	The control unit should contain inbuilt protection circuit to prevent treatment without proper applicator connection and proper indexer locking.
52	Equipment should have facility to Import treatment planning parameters in DICOM format from Brachytherapy planning systems via network, CD/DVD, or USB storage.
53	Online extensive display of status codes with an indication of the action required.
54	Large patient database should be provided with a backup option to an external storage device. Control unit should contain a built-in log book and all events should be recorded.
55	**RADIATION SOURCE & TRANSFER MECHANISM**
56	The HDR Brachytherapy system should have Co-60 source Specify the max, source activity.
57	Mention the source half-life and clinical working life of Co-60 source.
58	The source transfer guarantee must be enhanced in such a way that each source – must be utilized for an extended period (higher is preferred).
59	Mention the diameter of source and its characteristics of clinical usage, transfer guarantee and usability.
60	The source cable must be a multi strand type and must be able to negotiate treatment curvature of 1 cm radius.
61	The source cable should have a safe movement (Forward / backward) with an accuracy of (+ 1 mm and must be controlled by stepper motors.
62	The source transfer guarantee must be enhanced in such a way that each source must be utilized for an extended period of time
63	Source Capsule Shield should be Stainless Steel

64	Source Capsule Diameter Of maximum 1mm
65	Source Active length of minimum 3.5 mm
66	Source Active Diameter of minimum 0.5mm
67	Source position Accuracy must be +/-2.0 mm
68	Maximum treatment length should be minimum 400mm
69	The source drives out length from indexer should at least be 400 mm to reach farther sites of treatment.
70	Maximum number of source transfer capacity per source: Please specify
71	Treatment pathway curvature: Please specify
72	Source movement of incremental stepper motor must be 50cm/sec
73	Source step size should be 1mm
74	Maximum time required to supply the source from the date of placing order: Please specify
75	Surface contamination test to ISO 9979
76	Leak testing meets requirements of ISO 2920
77	**QUALITY ASSURANCE TOOLS:**
78	The vendor should ensure that all items required for commissioning and QA which are mandatory for as per AERB regulations should be provided.
79	Within the after loader there shall be a radiation detector, which shall give audible and visual warnings at the operator console and the after loader, that radiation is present when the source is extended in normal operation. The same radiation detector shall sound an alarm and will give visible indication radiation is present when it is intended that the source should have returned to the safe.
80	A Gamma Zone Monitor with latest calibration certificate shall be provided by the vendor which gives visual and audible warning inside the treatment room and at or near the operator console that radiation is present when the source is extended in normal operation.
81	LMO (Last Man Out) switch shall be provided and installed as per AERB guidelines
82	A source calibration well type chamber with matched cabling and electrometer shall be provided with latest calibration certificate.
83	Source position accuracy verification tool shall be provided.
84	A calibrated contamination monitor shall be provided.
85	CCTV Monitoring system with Two-way communication system
86	Survey Meter (Geiger-Meller Based) – High quality established brand
87	Source position check device
88	Indexer length measurement tool
89	Digital Barometer & Thermometer
90	Specify any other necessary quality assurance tools & supply

91	Insurance and Freight cost of the Sources for both onward and return of used source. The Clearance and transport of the sources and the Re-export / disposal of the decayed sources must also be included in the offer.
92	Company must provide site planning, installation, source loading and unloading commissioning & quality control
93	**APPLICATORS**
94	Oesophagus applicator with mask- Qty-01no's
95	Bronchus applicator with mask - Qty-01no's
96	Breast implant template set - Qty-01no's
97	Prostate implant template set - Qty-01no's
98	Gyn interstitial Template set with 30 needles of 20cm - Qty-01no's
99	Standard Intracavitary Fletcher Applicator set - Qty-02no's
100	Vaginal applicator set - Qty-02no's
101	Flexible Implants complete set of Flexible tubes 100 no's SL and 100 no's DL - Qty-02no's
102	Rigid Needle Implants complete set - (for each Length 20 numbers each small, medium, large please specify the length) - Qty-01no's
103	CT & MR compatible Cervix for Intracavitary Fletcher Type with Interstitial option - Qty-01no's
104	CT & MR compatible Vaginal Cylinders with variable length & Diameter - Qty-01no's
105	CT & MR Compatible Interstitial Ring Applicator set (60 Degree and 26mm Diameter) With Interstitial Application for Cervix including all the needles and accessories (minimum 30 needles)-Qty-01no's
106	Surface Mould applicator-Qty-01no's
107	**TRANSFER TUBES**
108	Transfer tubes for all channels for flexible tubes, rigid needles and other applicators.
109	**RADIO OPAQUE DUMMIES**
110	For all applicators
111	A set for interstitial dummies for implants
112	Applicators Sizes to be customized as Indian Standard
113	**TPS FOR HDR BRACHYRTHERAPY**
114	The equipment should have a complete 3-D Brachytherapy Planning system based on state-of-the-art hardware independent of the equipment console and with the latest user-friendly operating system.
115	The Planning System should be dedicated, in-house product of the HDR equipment manufacturer specifically developed to integrate with the HDR equipment.
116	It should support all brachytherapy treatment modalities capable for HDR stepping source.
117	It should be DICOM 3.0 and DICOM-RT compliant with import and export and print facility.

118	It should be possible to input CT images through network or CD and it should support multiple localization algorithms including CT & MRI based reconstruction. It should be possible to do 3- D multi-planar, volumetric catheter reconstruction. It must have different types of Dose Volume Histograms. The software should be FDA approved and must follow international recommendations like ICRU-38, TG-43 & ICRU-85.
119	Intel Core i5 processor/Higher Specification available
120	4 GB RAM
121	1 TB hard disk
122	DVD-RW drive, internal
123	4 x USB ports, 1 x serial
124	2/3 button wheel mouse and WIN keyboard
125	Windows 10 and Antivirus
126	22" or more with TFT/LCD/LED screen – Flat panel display
127	The hardware should be upgradable
128	Brachytherapy software must be provided and should support all of the Brachytherapy treatment modalities including intracavitary, interstitial, intraluminal and surface mould techniques.
129	All the reconstruction technique like, Orthogonal, Semi-orthogonal with reconstruction box, Variable angle, Isocentric must be available, CT Image based reconstruction, Dose Calculation based on TG43U1, Automatic placement of Basal Dose Points for Paris Technique, Automatic shielding for Applicator
130	Advanced optimization using dose points like geometry based, full or polynomial optimization for irregular, regular volume implants should be available in order to give dose conformity on implant volume and dose points.
131	Fast and accurate dose calculation considering radial dose function, anisotropy function and geometric function should be there.
132	Rapid reconstruction of catheter using tracking algorithm and indication of corresponding lines on the images should be present.
133	TPS should be capable to do Contouring in arbitrary planes
134	For outpatient treatments, extremely accurate and dwell time optimization and dose calculation must be available.
135	A standard library of treatment must be present for easy retrieval for protocol patients
136	Wide range of dose volume histogram methods, point dose option, Different plane's view must be available.
137	Inverse/Hybrid inverse Planning of Brachytherapy using volume optimization should be included in the offer.
138	TPS should be capable for calculation-based TG 43U1 Algorithm and TG 186
139	TPS should be capable of doing INVERSE PLANNING (IPSA/HIPO)
140	APPLICATOR MODELING LICENSE
141	PRINTER FOR TPS AND HDR

142	**NETWORKING**
143	Networking with the treatment machine for treatment execution should be possible.
144	Networking with CT, MRI for image acquisition should subsist possible.
145	Equipment should have capability to communicate to oncology Information system and the Oncology Information System will interface with the hospital EMR/HIS using HL7/ FHIR standards
146	The software should also be compliant with the requirements of the National Health stack and should have undergone ABDM sandbox testing if indicated in the NHA guidelines. Applicable for the OIS only and not for equipment
147	All necessary licenses to be provided for above all mentioned where relevant

S.NO	TENDER SPECIFICATIONS OF GAMMA KNIFE
1	The State-of-Art , advance and latest Stereotactic radiosurgery system should be able to perform stereotactic irradiation of head structures ranging from very small target size of few millimeters to several centimeters e.g. metastatic tumors, Arteriovenous malformations, Trigeminal neuralgia, Medically refractory essential tremor, Meningioma, Vestibular schwannomas, post-surgical Pituitary adenomas and recurrent Glioblastomas through gamma radiation with the principle of simultaneous cross-firing from more than 180 non-coplanar stationary radiation sources spread over a large spatial angle. It should provide different workflow options and adaption possibilities to each individual case like single or multiple sessions, frame based and frameless mask-based immobilization, routine Radiosurgery or Micro Radiosurgery.
2	**SYSTEM CONSOLE**
3	System should be supplied with all components of a fully automated system with integrated. Single robotic system, consisting of a radiation unit with three collimator sizes, housing for more than 180 Co-60 source(s) and Radiation shielding doors.
4	It should have fully integrated stereotactic cone-beam computed tomography (CBCT) imaging system for accurate stereotactic positioning
5	It should offer both frame based and frameless stereotactic radiosurgery procedures
6	It should be supplied with treatment planning system, system tool kit, spare part kit for coordinate frame, skull scaling instrument, mask adaptor, magnetic resonance (MR) head support, Thermoplastic masks for patient fixations, Patient marker set, CT Adaptor, MR Adaptor, Color Laser Printer, UPS etc.
7	Last Man Out Switch should be provided
8	**QUALITY ASSURANCE TOOLS FOR**
9	Focus precision, CBCT precision, and clearance check tool (CCT)
10	Perform tests for spatial resolution, contrast to noise (CNR), and uniformity of the CBCT imaging
11	Dosimetry phantom compatible with both metallic and non-metallic frames
12	Radiation phantom for standard dosimetry test - Dose-rate determination according to international code of practice e.g., IAEA-TRS-483, and AAPM TG-178 and Precision of the dose-distribution using film dosimetry
13	Film holders for independent QA Check for system accuracy
14	Radiation source(s) should be stationary during irradiation of patient
15	It should be able to treat functional targets as small as 4mm up to several centimeters.

16	It should offer advanced intrafraction motion management system to monitor micro movements of the patient's head enabling to cut off the radiation if the movement exceeds the set limit that has been defined by the user. The treatment should be continued from where it stopped when the patient returns back to the set tolerance
17	System should provide 'Adaptive Dose Control' with online Dose Evaluation algorithm to compare dose distribution
18	Dose delivery should be fully integrated, adaptive and automatic with auto correction of delivery plan according to patient position obtained from CBCT images taken at the time of treatment
19	Company must provide site planning, installation, source loading and unloading commissioning & quality control
20	In case of power failure, treatment should continue for at least one minute and all treatment parameters should be saved and treatment should be paused for resumption on return of power
21	Patient Surveillance System: Treatment room should include one intercom audio and video facility for communication with and observation of the patient
22	Operator console should include visual display of alarm system
23	Tampering Intrusion Detection Kit for Co-60
24	The vendor should ensure the following items required for commissioning and QA for the Stereotactic radiosurgery system should be provided. Thermometer, Barometer, thimble chamber, electrometer, survey meter.
25	Latest Gamma Zone Monitor with latest calibration certificate shall be provided by the vendor
26	**TECHNICAL PARAMETERS**
27	Patient Positioning System: Fully automatic & robotic with auto set up time
28	Minimum load capacity of couch: ≥ 200 kg
29	Real time High-Definition Motion Management with optical infrared tracking system with frame-based reference markers, patient marker and foldable infrared Camera to be provided with an accuracy of ≤ 0.2 mm and Motion gating threshold in HD motion: 0.5-3.0 mm
30	Mixed Collimation set up time (composite shot): < 3 sec
31	Radiobiological accuracy: Should be < 0.5 mm and guaranteed by manufacturer for the lifetime of the equipment if the system is under CMC
32	Positioning repeatability: ≤0.05mm
33	CBCT Imaging accuracy: ≤0.5 mm
34	Beam Penumbra: ≤1.4mm for smallest collimator
35	Mean extra-cranial dose: <0.01% of prescription dose at 50 cm from isocenter during a radio surgical procedure
36	Equipment should conform to the international standards of safety & radiation protection
37	Effective Dose Rate: > 3Gy/min at the time of loading
38	Collimator sizes: 4,8 & 16-mm diameter
39	Maximum Cobalt 60 activity at loading should be ≤6600Ci (244TBq)
40	The no. of radiation source: >180 s
41	It should be capable of a through put of >600 patients per year.
42	**TREATMENT PLANNING SYSTEM WITH RESPECTIVE NUMBER OF LICENSES AND WITH BELOW CAPABILITIES 3 NO'S**

43	Integrated treatment planning and management software system
44	Server, one connectivity license for System, one patient database, one DICOM server
45	**Licenses for the following:**
46	Preplanning /Retreatment- Real Time Dose Planning
47	Image Merge
48	Inverse Planning
49	Color PET
50	DICOM RT
51	Convolution License
52	Mask License
53	Functional Planning
54	Software to create plans quickly and automatically for one or more targets through optimization based on dose constraints for targets and organs at risk, together with controls to minimize beam-on-time and overall low dose to surrounding tissues to reduce both planning and treatment time
55	System should be capable of providing remote access solution which enables off-site planning and screen sharing for the purpose of collaborative plan review and approval
56	DICOM to support images from MR, CT, PET, Projective Xray angiograms
57	Non stereotactic images co-registration should be able to automatically co-register with stereotactic images
58	Stereotactic Image fusion should be automatic
59	Image import capability should be DICOM Image transfer over network
60	Critical structure protection using automatically generated beam blocking
61	Should support at least 30 or more isocenters per plan
62	Should support planning of at least 30 or more targets in one treatment
63	Possibility to create different plans for one treatment for one evaluation
64	Pre-planning of treatment should be possible days before surgery
65	Should be capable of supporting re-treatments & possibility to overlay previous treatment data
66	Functional targeting using AC-PC landmarks & functional target formulas and stereotactic atlas
67	Check & verify protocol: export of treatment plan protocol prior to treatment and operators reports after completed treatment
68	Stereotactic scaling should be automatic with full error analysis.
69	Online patient database with instant accessibility & back up up to 10 Terabytes.
70	Realtime update of dose distribution should be provided
71	**TREATMENT PLANNING CONSOLE HARDWARE**
72	Latest Branded High-End Workstation. The workstation provides the performance needed for heavy dose calculation and real-time 3D visualization
73	Integrated CBCT alternatively should provide online reference image to set coordinates for frameless SRS with help of mask with same accuracy as attained with frame-based fixation
74	Equipment should have capability to communicate to oncology Information system and the Oncology Information System will interface with the hospital EMR/HIS using HL7/ FHIR standards
75	The software should also be compliant with the requirements of the National Health stack and should have undergone ABDM sandbox testing if indicated in the NHA guidelines. Applicable for the OIS only and not for equipment

76	All necessary licenses to be provided for above all mentioned where relevant