

S/No: 02

Appendix-'1B(i)'

QRS/SPECIFICATIONS AND TRIAL DIRECTIVES OF MEDICAL EQUIPMENT OF RADIOLOGY DEPARTMENT :-

S. No.	Name of the Equipment	Is available in PET (as per 100 bedded) If yes then mention S.No of PET	QR's available or not	Remarks
1.	100 mA X-RAY MACHINE	Yes, S.No - 27	Yes	Annexure-1
2.	300 mA X-RAY MACHINE	No	Yes	
3.	1000 mA DIGITAL X-RAY MACHINE	No, But Available in PET of 200 bedded hospital, between S.no. 13 and 14. No serial no. is assigned	Yes	
4.	CT- 64 ANGIO DETECTOR	No	Yes	Annexure- CT machine having 64 detector rows is able to take 128 slices per 360° rotation. Hence to be labelled as 128 slice CT machine whose QR's are separately attached at Sl. No. 11. This entity may be better named as '64 slice CT machine'. 64 slice machine is cheaper than its 128 slice counterpart and likely to save government funds
5.	DEXA BONE DENSITOMETRY	Yes, S. No - 29	Yes	
6.	MAMMOGRAPHY MACHINE	Yes, But available in PET of 50 bedded hospital at S.No - 32	Yes	
7.	1.5 TESLA MRI PLANT	No, But 3 tesla MRI Available in PET of 200 bedded hospital at S.no 22	Yes	
8.	USG WITH COLOUR DOPPLER	Yes, But available in PET of 50 bedded hospital at S.No - 30	Yes	

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Recommendation of Adh. Medical Officer

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No.	Name of the Equipment	Is available in PET (as per 100 bedded) If yes then mention S.No of PET	QR's available or not	Remarks
9.	500 mA DIGITAL X-RAY MACHINE (WITHOUT FLUOROSCOPY)	Yes, S.No - 25	Yes	
10.	MULTI LOADER CR SYSTEM	Yes, S.No - 28	Yes	
11.	CT SCAN (128 SLICE)	No, But Available in PET of 200 bedded hospital at S.no 21 by nomenclature 'Whole body 128 slice CT scanner'	Yes, By the name of 'CT angio machine'	
12.	OPG X- RAY MACHINE (DIGITAL)	Yes, S.No. 31 By a different nomenclature - "Digital panoramic x-ray unit with cephalogram"	Yes, By a different nomenclature - "Digital panoramic x-ray unit with cephalogram"	
13.	PIEZO DIGITAL MAMMOGRAPHY UNIT	No, But available in PET of 200 bedded hospital at S.No - 17	Yes	

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QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF 100 mA MOBILE X-RAY MACHINE














S. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRIAL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
1.	High frequency Mobile Digital Radiography machine with a touch screen & a portable W/F-I flat panel detector of size 35 cm X 43 cm or more • It is a light weight machine which allows the user easy maneuverability in congested areas of wards, ICU's or hospital/clinic. Its ergonomic articulated spring balanced or articulated tube -stand allows the operator to position the tube for acquiring the images of desired views. • The X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality. • Touch screen tablet for instant review of image. • Compact and light weight.	Check data sheet and physically and also ask the under taking from manufacturer	Should comply as per requirement
2.	GENERATOR & TUBE X-Ray Generator Type: High frequency microprocessor controlled Power Output: 4.2 KW or more Generator Frequency: 110Khz or better KV Range: 40 to 120 KV or more in 1 KV/step. Maximum mA: 100 mA or more mas Range: 1-200 mas	Check data sheet and physically.	Should comply as per requirement
3.	Dual action hand switch & IR remote for ready & Exposure should be provided.	Check Physically	Should comply as per requirement
4.	X-Ray Tube Head: - Mono-block version x-ray tube head should be provided. The mono-block should consist of X-Ray tube, H.V. transformer, filament transformer, H.V. rectifiers and capacitors, all immersed in high grade oil with high dielectric strength. Mono-block Tube Head should be Protected for thermal overload Anode type Stationary/ tablet Anode Focal Spot 1.8mm or less Heat Storage Capacity 42KHU or more	Check data sheet and tube make model	Should comply as per requirement
5.	Conversion screen/ Scintillator: Cesium Iodide (CsI)	Check data sheet	Should comply as per requirement

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Recommendation of ADB (Med) Not Recommended

S. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
6.	Photodiode: amorphous silicon (a-Si)	Check data sheet	Should comply as per requirement
7.	Size: 43 cm x 35 cm or more	Check data sheet and physically	Should comply as per requirement
8.	Active Image Matrix: 2.8 K x 2.3 K or better	Check data sheet and physically	Should comply as per requirement
9.	Limiting resolution: 3.33 lp/ mm or better	Check data sheet	Should comply as per requirement
10.	Pixel pitch: 150 µm or better	Check data sheet	Should comply as per requirement
11.	Weight of the detector: Less than 4 kgs or less Detector holder: Yes Image storage in FPD: up to 100 Images or more	Check data sheet and physically	Should comply as per requirement
12.	IMAGING SOFTWARE Main features <ul style="list-style-type: none"> • Patient Entry (Manual Emergency and MWL) • Patient Search Based On PID, NAME, DATE • Exam window • Process window • View Window • Print Window Post processing features: - <ul style="list-style-type: none"> • WWW/MWL • Rotate • Zoom • Flip • Invert • Annotations • Measurements DICOM Compatible features: - <ul style="list-style-type: none"> • DICOM MWL • DICOM print • DICOM Send 	Check data sheet and physically	Should comply as per requirement

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S. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
13	<p>TUBE STAND:</p> <p>Spring balanced stand / articulated is a mobile stand designed keeping in view the stringent requirements of mobility, light in weight & easy maneuverability and ease of operation. This mobile stand should be made to withstand all jerks while in use offering unparallel reliability. Tube stand should be easily moved on floor and lock should be provided to lock the movement on floor with following details</p> <ul style="list-style-type: none"> • Tube Head rotation of +/90° along horizontal axis & +90° to -30° or better along tube axis • Weight of the machine should be 150 kgs or less • Min height should be 150 cm or less 	Check data sheet and physically	Should comply as per requirement
14	<p>Power Supply:</p> <ul style="list-style-type: none"> • 1-Phase 230V (AC-supply) 50/60 Hz, ±10% with automatic compensation • 15 Ampere wall socket 	Check data sheet and physically Check data sheet and physically	Should comply as per requirement
15	<p>STANDARD, SAFETY & TRAINING (OTHER REQUIREMENTS):</p> <p>The company should be ISO, EN-ISO & ICMED certified. The unit should be approved by AERB. The unit should be European CE Certified from Notified body. The company should have a local Service center. The company should have proven track record in Govt. sector. Firm should provide demonstration /training regarding the equipment at user location.</p>	Physically check the all certificates.	Should comply as per requirement
16	<p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	Physically check the all certificates.	Should comply as per requirement

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Recommendation of ADG (med) Not Recommended

2. QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF 300 MA X-RAY MACHINE

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRIAL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
01	Unit should be specifically designed for all aspects of general X-Ray imaging and operating at a High Frequency of 50 KHz for highly efficient X-ray production and preeminent Image Quality. The Integrated Design of the machine allows the operator to acquire X-ray Images very conveniently. X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality.	Check Data Sheet for 50 KHZ and to confirm the Generator, Detector and Console software from same manufacturer Check the Data Sheet and Physically and also get the undertaking from the manufacturer.	Should comply as per requirement
02	<p>HIGH FREQUENCY GENERATOR:</p> <ul style="list-style-type: none"> Generator should be of latest technology with high frequency 50 KHz X-Ray generator Constant Power output of 30 KW or more 300mA at 100 KV KV range should be 40 to 125 KV or more in 1 KV/step mA output: 300 mA or more mAs range should be 1 to 200 mAs or more 	Check in data sheet and physically also on console	Should comply as per requirement
03	<p>X-RAY TUBE</p> <ul style="list-style-type: none"> A Dual focus Rotating anode X-ray tube should be provided. Focal spot size of 1.0mm (small focus) x 2.00 mm (large focus) or less Anode heat storage capacity should be 140 KHU or more Multi leaf Collimator having halogen lamp / bright light source and auto shut provision of the light. 	Check the data sheet of x-ray tube	Should comply as per requirement
04	<p>STAND</p> <p>Tube Stand with Counter Balanced Tube Head with following features should be provided</p> <p>Tube Stand:</p> <ul style="list-style-type: none"> Height of the stand: 2200 mm or Less Longitudinal movement of column on track: 1900 mm or more Total up/down movement of the tube head: 1300 mm or more. Tube rotation: +180 degree 	Check physically on Stand.	Should comply as per requirement

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
05	<p>Detector Stand,</p> <ul style="list-style-type: none"> • Height of the stand: 2200mm or Less • Up /down travel of Bucky: 1300mm or more • Bucky tilting angle: 0° to 90° or more to be provided • Removable grid should be provided 	Check physically on Stand.	Should comply as per requirement
06	<p>TABLE:</p> <p>Mobile Diagnostic table should be provided.</p> <ul style="list-style-type: none"> • Table should be of following dimensions: <ul style="list-style-type: none"> - Length: 2000 mm or more - Width: 700 mm or more, - Height from ground: 725 mm or less • Locks should be available on front wheels for table stability during exposure. • Maximum weight carrying capacity for the table should be 180Kg or more. 	Check physically	Should comply as per requirement
07	<p>FLAT PANEL DETECTOR: Specifications:</p> <ul style="list-style-type: none"> • The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator. • Size of detector must be 43 cm x 43 cm or more • Active Image matrix 3K x 3K or better • Image depth should be 14bit or better • Pixel size should be 150um or less (Smaller pixel size is preferred) • Detector resolution should be more than 3.3 lp/mm • DQE (Detector Quantum Efficiency) should be more than 65%. 	Check data sheet of the detector and check material. Also take the undertaking from Vendor.	Should comply as per requirement
08	<p>OPERATING STATION/WORK STATION:</p> <p>X-RAY/IMAGE CONTROL CONSOLE</p> <p>Fully integrated system with following features:</p> <ul style="list-style-type: none"> - Digital Display of KV & mAs. - KV & mAs increase and decrease control on Graphical user interface - Ready and X-Ray ON indication on Graphical user interface. 	Check Physically on Console.	Should comply as per requirement

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
	<ul style="list-style-type: none"> - Self diagnostic Program for error code display of faults such as Earth fault error, KV error, Filament error & Tube's Thermal Overload. - An Inbuilt overload protection device. - Anatomical Programming Radiography (i.e. APR): Preprogrammed parameters of human Anatomy which helps the user to select exposure parameters based on body part, examination view and size of the patient. Since it is a computer-based system (full system integration) so any number of Organ programming combinations is possible. User can define his own Organ parameters and can edit the existing parameters to his satisfaction and comfort level. - APR programs: More than 1000 programs. (Expandable as per user's requirement). - A dual action hand Switch with Retractable cord for Radiation Protection of Operator. 		
09	<p>IMAGE ACQUISITION SOFTWARE AND ITS CHARACTERISTICS</p> <p>Software provides complete control of all image capture functions within the examination room. It enhances the entire workflow by delivering diagnostic images instantly. It also allows user to transfer X-Ray images electronically to remote workstations, image archives, and printers, also has an excellent performance on image quality control such as:</p> <p>MAIN FEATURES</p> <ul style="list-style-type: none"> • Digital image processing technology • Preview image in less than 5 seconds. • Exam Specific Algorithms image processing for consistent image quality of all body parts. • Preset image processing tools for different anatomy • Image cropping • Image mirror, rotate. • Image annotation • Add image accept/reject comments • Separate log for Rejected, Accepted and Printed images. 	<p>Check Physically on Console.</p>	<p>Should comply as per requirement</p>

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Recommendation of Approved

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3. QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF 1000 mA DIGITAL X-RAY MACHINE

S NO.	SPECIFICATION	PROCEDURE SUGGESTED FOR TRIAL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
01.	Digital Radiography/Fluoroscopy System with dynamic fixed Flat Panel Detector in Remote Controlled RF table & static detector in vertical bucky stand. Unit should be capable of doing all types of Fluoroscopic examinations like GI examination, ERCP, barium studies, along with radiography procedure. X-Ray generator, detector & software should be from same manufacturer for seamless connectivity and consistent image quality.	All the Parameters check Physically and also check the datasheet of Generator, Detector and Software all three from same manufacturer.	Should comply as per requirement
02.	X-RAY GENERATOR: <ul style="list-style-type: none"> High Frequency X-Ray Generator of frequency should be provided. Power output of generator should be 80 KW or more KV Range should be: <ul style="list-style-type: none"> Radiographic KV: 40 to 150 KV or more Fluoroscopic KV: 40 to 120 KV or more mA Range (Rad.): 1000 mA or more mA Range (Fluoroscopy): Normal Fluoro. Mode: - up to 40 mA or more HD/Boost Fluoro/Cine mode: - up to 70mA or more Exposure time (Rad.): 1 ms to 2 Sec or more. Cumulative fluoro. timer to cut off exposure mAs Range (Rad.): 1 to 200 mAs or more. 	Check Data sheet Check Data sheet and Physically on generator or operating console Check Physically on console Check Physically on console or data sheet Check Physically on console	Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement

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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
03.	<p>CONTROL:</p> <ul style="list-style-type: none"> The control Panel should be LCD Touch Panel TFT Display parallel to software screen and should have following functions & indications. Integrated panel to control the image parameters & Exposure parameters from software GUI Machine ON/OFF Switch. Digital Display of KV & mAs. KV & mAs increase and decrease switches Self-diagnostic Programme with Indicators for Phase failure error, KV error, filament error & Tube's Thermal Overload. Preprogrammed parameters of human Anatomy > 150 programs which helps the user to select exposure parameters based on body part, examination view and size of the patient. Dual step hand switch for Ready & Exposure 	<p>Check the operating console</p> <p>Check Physically on console</p> <p>Check Physically on console</p> <p>Check Physically on console</p> <p>Check Physically on console</p> <p>Check Physically on console</p> <p>Check Physically on console</p>	<p>Should comply as per requirement</p>
04.	<p>X-RAY TUBE (02Nos.):</p> <p>For table side</p> <ul style="list-style-type: none"> A Dual focus Rotating Anode X-Ray tube thermally protected having focal spot of 0.6 & 1.2 or less Anode rotation speed should 9000 RPM minimum. Anode heat storage capacity of tube should be minimum 600 KHU <p>For Ceiling Suspended-Motorized</p> <ul style="list-style-type: none"> A Dual focus Rotating Anode X-Ray tube thermally protected having focal spot of 0.6 & 1.2 Anode rotation speed should 9000 RPM minimum. Anode heat storage capacity of tube should be minimum 300 KHU 	<p>CHECK Physically both tubes</p> <p>Check Physically and confirm the tube make and model in data sheet</p> <p>Confirm in data sheet</p> <p>Confirm in data sheet</p> <p>Check Physically and confirm the tube make and model in data sheet</p> <p>Confirm in data sheet</p>	<p>Should comply as per requirement</p>

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
07.	DYNAMIC FLAT PANEL DETECTOR (FPD): (Inbuilt in Remote controlled, motorized RF Table) A complete imaging solution with cutting edge of performance integrated with our X-ray systems.	Check physically	Should comply as per requirement
08.	FPD should have following specifications or better Receptor type: Amorphous Silicon Scintillator: Cesium iodide (CsI) Size of detector: 43 x 43 cm or more Image matrix size : 3K x 3K or more A/D conversion : 16 bits Pixel size: 140 µm or less. Detector resolution should be more than 3.3 lp/mm. DQE:65% or more at 0 lp/mm.	Confirm with data sheet of detector and take an undertaking from vendor Check physically Confirm with data sheet of detector and take an undertaking from vendor	Should comply as per requirement
09.	IMAGE ACQUISITION SOFTWARE should have following features available Exposures mode: RF (Flouro, Cine and Spot) and DX (Radiography) Frames per second: Flouro& Cine: up to 15 FPS Advance features: Flouro and Cine <ul style="list-style-type: none"> • AEC for Radiography • Auto Sync of Software and Hardware in case of Power failure. • Configurable RF procedures and RAD APR protocols. 	Check all the features Physically on console/operating work station Check all the features Physically on console/operating work station Check all the features Physically on console/operating work station	Should comply as per requirement Should comply as per requirement

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<p>Post processing:</p> <ul style="list-style-type: none"> • Live Image WLWW adjustment • WLWW (Manual & Automatic) adjustment in LIVE & in LIH Image • Zoom with PAN • Magnify • Image Invert (Negative) • Image Flip Horizontal & Vertical • Annotations • Multiple Image Layouts • Cine loop Play with frame by frame image view • Software shutters/crop • Tagging of images • Angle and Length Measurements <p>DICOM COMPATIBILITY: Fully compatible with 3.0 DICOM standard</p>	<p>Check all the features Physically on console/operating work station</p>	<p>Should comply as per requirement</p>
10.	<p>CEILING SUSPENDED TUBE STAND:</p> <ul style="list-style-type: none"> • Motorized 3D- Ceiling Suspended tube stand should be a new generation stand providing the user three-dimensional movements of the tube head covering a huge area. Noiseless and swift up/down movement of the tube head should be provided. • Stand should have motorized Longitudinal, Transverse and vertical movements. It should have Tube Head Rotation along its axis. <p>Movements of stand should be:</p> <ul style="list-style-type: none"> • Motorized Longitudinal movement more than 2800mm • Motorized Transverse movement more than 1800mm • Motorized Vertical up/down movement motorized: more than 1400 mm • Tube head Rotation (along with Column axis): $\pm 180^\circ$ • Tube head Rotation (along Horizontal axis): $\pm 135^\circ$. 	<p>Check all the features/ movements on Ceiling suspended tube. Physically on</p>	<p>Should comply as per requirement</p>

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
11.	<p>VERTICAL BUCKY STAND:</p> <ul style="list-style-type: none"> Floor mounted Motorized Vertical bucky stand should have inbuilt FPD (FLAT PANEL DETECTOR) for lung and skeleton x-ray examinations. It should have user friendly design and handling. VB stand should have provision to do chest radiography with and without grid. Motorized Tilting should be -30 degree to + 90 degree. Vertical up Down Movement should be 1200mm or more. AEC mode with use of ion chambers should be provided which enables auto selection of radiographic factors, saves time, eliminates retake, increases diagnostic capability and lowers radiation dose, calibrated to multiple exposure classes/densities. 	<p>Check all the features/ movements on vertical bucky stand it must have fix detector not wifi and AEC on Console also</p>	<p>Should comply as per requirement</p>
12.	<p>STATIC FLAT PANEL DETECTOR (FPD): (Inbuilt in VERTICAL BUCKY):</p> <p>Specifications:</p> <ul style="list-style-type: none"> The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator. Size of detector must be 43 cm x 43cm. Active Image matrix 3K x 3K. Image depth should be 14 bit or more. Pixel size should be 140 um or less (Smaller pixel size is preferred) Detector resolution should be more than 3.3 lp/mm. DQE (Detector Quantum Efficiency) should be more than 65%. 	<p>Confirm with data sheet of detector and take an undertaking from vendor and size of the detector should check physically</p>	<p>Should comply as per requirement</p>
13.	<p>MONITORS: 2 Nos. monitors. of size of 27", or more One in examination room integrated on trolley and 2nd in console room with resolution of 1920 x 1080 pixels or more should be provided.</p> <p>Additional reporting workstation with 19" or more Medical display monitor with below feature is provided</p> <p>Advance Features: -</p> <ul style="list-style-type: none"> DICOM Store DICOM Print Job Queue 	<p>Check Physically</p> <p>Check Physically</p>	<p>Should comply as per requirement</p>

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
14.	<p>POWER REQUIREMENT:</p> <ul style="list-style-type: none"> The unit should be operable on 400V AC, 50 HZ 3 Phase – Max. Allowable line Regulation ± 10%. Suitable rating UPS for software system should be provided 	<p>Check the data sheet and also check the UPS physically</p>	<p>Should comply as per requirement</p>
15.	<p>IMAGE STITCHING:</p> <ul style="list-style-type: none"> Auto image stitching with provision of 4or more image stitching should be provided. Necessary hardware as well as software should be provided. 	<p>Check data sheet as well as physically</p>	<p>Should comply as per requirement</p>
16.	<p>ACCESSORY:</p> <ul style="list-style-type: none"> A servo voltage stabilizer of suitable rating for complete unit. Suitable rating UPS is provided for memory software. 	<p>Confirm with the datasheet and compliance statement.</p>	<p>Should comply as per requirement</p>
17.	<p>OTHER REQUIREMENTS: The company should be ISO & ICMED certified.</p> <ul style="list-style-type: none"> The unit should be approved by AERB. The company should have proven track record in Govt. sector. Firm should provide demonstration /training regarding the equipment at user location. The unit should be European CE from notified body should be provided. 	<p>Physically check the both certificates in bid documents</p> <p>Physically check PO AND Performance certificates in the bid documents</p> <p>Physically check certificates in bid documents</p>	<p>Should comply as per requirement</p>
18.	<p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years Comprehensive annual maintenance contact (CMC) after 5 years warranty period should be quoted by vendor</p> <ul style="list-style-type: none"> X-Ray generator, detector & software should be from same manufacturer for seamless connectivity and consistent image quality. 	<p>Physically check make of manufacturer on detector, generator and software and also take the undertaking from vendor.</p> <p>Physically check the all certificates.</p>	<p>Should comply as per requirement</p>

Recommendation of A.D (CMED)

Recommendation of A.D (CMED)

Not to be considered

Member-I
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Member-XI
Member-XII

(Handwritten signatures and initials across the member list)

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS		RESULTED EXPECTED / DESIRED
3	<u>X-Ray Tube:</u> • Tube Voltage: 80-110 kV or more	Check	Product	Should comply as per requirement
		datasheet and console monitor		
4	• Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube <u>Patient Table:</u> • Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less. • Metal free scan-able range of 150 cm or more.	Check	Product	Should comply as per requirement
		datasheet and Patient Table / console monitor		
5	<u>Spiral Acquisition:</u> • Scan Time should be 0.5 sec or less for full 360-degree rotation. • Minimum slice thickness should be 0.625 mm or less.	Check	Product	Should comply as per requirement
		datasheet and console monitor		
	• Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.56 to 1.5 or more. Specify all possible pitch selections.	Check	Product	Should comply as per requirement
		datasheet / console monitor		
	• Bolus Triggered or bolus chase spiral acquisition should be available.	Check	Product	Should comply as per requirement
		datasheet / console monitor		

Recommendation of ABU (Med)
Not Recommended

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-X	Member-XI	Member-XII

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	<ul style="list-style-type: none"> Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual. 	Check Product datasheet / console monitor	Should comply as per requirement
6	Image Resolution:	Check Product datasheet	Should comply as per requirement
	High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV. Low contrast resolution – 5 mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.	Check Product datasheet	Should comply as per requirement
7	Data Acquisition System:		
	Detector- Capable of acquiring 64 or more slices per 360 degree of rotation.	Check Product datasheet and console monitor	Should comply as per requirement
	At least 32 or more rows of independent detectors are required with Z-axis coverage of 20 mm or more. Solid state or rare earth detectors of latest technology free from repeated calibration.	Check Product datasheet and console monitor Check Product datasheet	Should comply as per requirement Should comply as per requirement
8	Image Reconstruction:		
	High-speed real-time reconstruction with display matrix of 1024 x 1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.	Check Product datasheet and console monitor	Should comply as per requirement
9	Operator Console:		
	High resolution medical grade LCD color monitors of 19 inch or more.	Check Product datasheet and console monitor physically	Should comply as per requirement
	Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation.	Check Product datasheet and console monitor	Should comply as per requirement

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Recommendation of Ashwini
Recommended / Not Recommended

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<ul style="list-style-type: none"> Raw Data & Image storage with at least 500 GB Hard disc. System should have image storing capacity of 5,00,000 or more in 512x512 format. Auto-voice capability with custom designed key board and mouse. Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided. 	<ul style="list-style-type: none"> Check Product datasheet Check Product datasheet and physically Check technical offer 	<ul style="list-style-type: none"> Should comply as per requirement Should comply as per requirement Should comply as per requirement
10	<p><u>Workstation and Client Server architecture</u></p> <ul style="list-style-type: none"> It should be, a high speed (minimum post-processing frame rate of 16 frames/sec) CPU with a speed of 3.0 GHz or better and with an independent Hard disc storage capacity of 512 GB or more, with 19 inches or more high resolution medical grade colour LCD monitors capable of simultaneously viewing and performing all post processing functions and filming independently without the help of main console. Memory of the workstation should be independent of the console. Two-way data transfer between the operator console & the satellite workstation should be automatic and standard. Post Processing Soft-wares Perfusion CT for brain CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view. Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps. Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction Automatic bone Removal facility. Dental CT. 	<ul style="list-style-type: none"> Check product / WS Datasheet and technical offer Check product / WS Datasheet Check WS Datasheet and quotation Check WS Datasheet and quotation Check WS Datasheet and quotation Check WS Datasheet and quotation Check WS Datasheet and quotation Check WS Datasheet and quotation 	<ul style="list-style-type: none"> Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement Should comply as per requirement

Recommendation of Adh (med)
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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
(vii)	Lung nodule evaluation software. CAD for Lung nodule evaluation software should be quoted as optional.	Check WS Datasheet and quotation	Should comply as per requirement
(viii)	Liver segmentation display software in different colours, volume try	Check WS Datasheet and quotation	Should comply as per requirement
	Interactive & Automatic Cine display should be available.	Check product datasheet / console monitor	Should comply as per requirement
	Image Evaluation Tools:		Should comply as per requirement
(i)	Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms,		Should comply as per requirement
(ii)	Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.		Should comply as per requirement
(iii)	Distance & angle measurement, freely selectable, positioning of co- ordinate system, grid and image annotation.	Check WS datasheet and technical quotation	Should comply as per requirement
	One similar independent post processing station (workstation, total no. 1) with 01 additional viewing station for Radiologist. The necessary connectivity etc. for proper functioning should be provided by the vendor. All post processing facility and data archiving should be available independently at both the workstations.		Should comply as per requirement
	Must have internal minimum storage capacity of 5,00,000 images of 512x512 format.	Check product datasheet	Should comply as per requirement
	Workstation software / licenses must be from the same manufacturer.	Check WS datasheet	Should comply as per requirement
11	Patient communication system:		
1.	An integrated intercom and Automated Patient Instruction System (API) should be provided.	Check product datasheet and physically	Should comply as per requirement
2.	Two closed circuit TV for patient monitoring.	Check technical offer	Should comply as per requirement
12	Dry Laser Imager:		

Recommendation of ABG (Med)
 Recommendation Not Recommended
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




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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1.	Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500) Films) of 14x17 inch size along with System.	Check technical offer	Should comply as per requirement
2.	Support Multiple Film Sizes: one of which must be 17"x14"	Check technical offer	Should comply as per requirement
3.	DICOM 3.0 Compatible.	Check technical offer	Should comply as per requirement
13	System Configuration Accessories, spares and consumables:		
	• Collapsible wheel chair with rubberized swivel wheels – 01 no.	Check technical offer	Should comply as per requirement
	• Standard Patient positioning accessories and restraining devices - 01 set.	Check technical offer	Should comply as per requirement
	• Light weight- ZERO LEAD Radiation protection apparels including Aprons -5 Nos.	Check technical offer	Should comply as per requirement
	• Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos.	Check technical offer	Should comply as per requirement
	• Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations	Check technical offer	Should comply as per requirement
	• Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup.	Check technical offer	Should comply as per requirement
	• Dual Head Pressure Injector with 100 syringes of 200ml.	Check technical offer	Should comply as per requirement
	• System must be PACS, HIS/RIS interface ready without any new hardware or software.	Check Product datasheet and main console / technical offer	Should comply as per requirement
	• A free comprehensive software update guarantee for entire life of scanner must be provided.	Check Undertaking submitted by bidder	Should comply as per requirement
14	Warranty: 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.	Check terms and condition submitted by bidder	Should comply as per requirement
15	Comprehensive Maintenance Contract for next five years including all the accessories, Air conditioning and CT Tube.	Check CMC offer submitted by bidder	Should comply as per requirement

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Recommendation of All Members
Not Recommended

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
16	Instructions to the vendors/suppliers: All companies must give product data sheets confirming the specifications along with the tender. The compliance statement must be filled strictly under the heading given in the tender. Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered. Vendors are requested to see the site for installation of the CT.	Check compliance statement, quotation etc. submitted by the bidder	Should comply as per requirement
17	AERB site approval: Vendors will support Hospital authorities for getting AERB Site approval, Final responsibility will be of hospital authorities.	Check compliance statement and undertaking submitted by the bidder	Should comply as per requirement
18	CT Room as per AERB Safety Protection Interiors Works - CT scan machine should be provided on Turnkey basis Bidders are supposed to visit site before submission of tender.	Check Turn-key quote submitted by the bidder	Should comply as per AERB norms/requirements
1.	Layout plan preparation as per AERB.	Check Turn-key quote submitted by the bidder	
2.	Interior, Tiling, Electrification International standards.	Check Turn-key quote submitted by the bidder	
3.	Lead lined doors as per AERB Safety Norms.	Check Turn-key quote submitted by the bidder	
4.	Lead Equivalent viewing glass as mentioned in specs with lead framing entire console room.	Check Turn-key quote submitted by the bidder	
5.	Trench up to UPS & Gantry.	Check Turn-key quote submitted by the bidder	
6.	Split AC Standard brand	Check Turn-key quote submitted by the bidder	
7.	02 Ton total no - 02 1.5 Ton total no - 05	Check Turn-key quote submitted by the bidder	
8.	Earthing up to Electrical panel.	Check Turn-key quote submitted by the bidder	

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Recommendation of Adh (med)
Recommended / Not Recommended

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
9.	Exposure warning indication system.	Check Turn-key quote submitted by the bidder	
10.	MAP Approval by AERB. CT scan complex should consist of CT room, Console room, battery/UPS room, Preparation room for patients, Changing room, Waiting lounge, Separate toilets for ladies and gents, Reporting room for radiologist with attached toilet, Technician room, Store.	Check Turn-key quote submitted by the bidder	
11.	Turnkey bidder must coordinate with OEM/ Installation engineer.	Check Turn-key quote submitted by the bidder	
12.	System interfacing cabling.	Check Turn-key quote submitted by the bidder	
13.	Required furniture (Computer tables, revolving chairs, patient chair) in all the rooms -	Check Turn-key quote submitted by the bidder	

Recommendation of ADG (mer)
Recommendation
Not Recommended
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S NO.	QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF DEXA BONE DENSITOMETER SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1	<p><u>Technical details:</u></p> <ul style="list-style-type: none"> Fan-Beam Technology Patient part localizer cross hair laser light One Pass Acquisition Technique; Multi-Detector Array Scanning Method High-resolution multi-element detector array with gadolinium sulfuroxylate GADOX scintillator technology - 200 detectors or more High Frequency X-ray Generator X-ray System Switched-pulse dual-energy (100 kVp/140 kVp or more) Motorized Table and Rotating C-arm Internal continuous calibration Computer Console. 	<p>Check with Data sheet</p> <p>Check physically on machine</p> <p>Check one pass physically on table and Data sheet for detector</p> <p>Check with data sheet</p> <p>Check data sheet</p> <p>Check physically on monitor and data sheet</p> <p>Check physically on machine</p> <p>Check data sheet</p> <p>Check physically</p>	Should comply as per requirement

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR/TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
2	<p>Standard Computer Hardware:</p> <ul style="list-style-type: none"> • Computer Workstation with Dual Core 3 GHz or better • Windows operating system • 1 TB or better hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2TB x 2 nos. • 19" or more Widescreen LCD/TF/LED Monitor • Colour laser printer. • Online suitable UPS minimum 30 Minutes Battery Backup. • External Shielding : Not required • BMD Precision : <1.0% or better • Table Height : 28" or less • Patient Weight Limit : 227 kg or more 	<p>Check physically on monitor /data sheet as applicable</p>	<p>Should comply as per requirement</p>
3	<p>Standard Configuration:</p> <ul style="list-style-type: none"> • DXA Operating System • Automatic PASS/FAIL Quality Control • Fast/Express BMD 10.Second or less Acquisition • Single Energy Scan Display Capability • Window/Level Control for Image Optimization 	<p>Check physically on monitor /data sheet as applicable</p>	<p>Should comply as per requirement</p>
4	<p>Exposure Time and dose:</p> <ul style="list-style-type: none"> • Lumbar spine..... 10 sec / 0.04 mGy or less • Proximal Femur 10 sec / 0.04 mGy or less • Single Energy femur 15 sec / 0.025mGy or less • IVA in High Definition ... 15 sec / 0.025 mGy or less 	<p>Check data sheet for dose and time, confirm physically</p>	<p>Should comply as per requirement</p>
5	<ul style="list-style-type: none"> • Auto Hip Positioning • Reposition/Rescan Feature • Automatic Scan Comparison for Serial/ previous Exams <p>Reporting Software</p> <ul style="list-style-type: none"> • 10 Year Fracture Assessment • Dual Hip Report • Femur Fracture Assessment High Resolution Imaging Capability • Pediatric Analysis for Spine, Femur and Forearm • Pediatric Whole Body with Body Composition Assessment • Infant Scan • Small animal for research. 	<p>Check data sheet and confirm physically</p>	<p>Should comply as per requirement</p>

Recommendat on of AD's (med)
Recommendat Not Recomm- ened

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	Scan and Analysis Protocols: <ul style="list-style-type: none"> • AP Lumbar Spine Analysis, Scoliosis Analysis • Supine Lateral Spine with Baseline Compensation • Proximal Femur Analysis and Hip • Dual Hip Feature • Forearm • Whole Body BMD • Advanced Body Composition Analysis with Inner Core • NHANES body composition reference data • Additional age, sex and ethnic matched reference data • Visceral Fat Assessment • Inter Vertebral Assessment with High Resolution Imaging Capability 	Check data sheet and confirm physically	Should comply as per requirement
7	STANDARD, SAFETY & TRAINING: <ul style="list-style-type: none"> - The company should be ISO, EN-ISO& ICMED certified. - The unit should be approved by AERB. - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. 	Physically check the all certificates.	Should comply as per requirement
8	Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor	Physically check the all certificates.	Should comply as per requirement

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Recommendation of ADS (med)
Recommen ded /Not Recommended

5. QRS/SPECIFICATIONS & TRAIL DIRECTIVES OF MAMMOGRAPHY MACHINE

Appendix-'1B(LXVIII)'

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1	<p>X-RAY GENERATOR</p> <ul style="list-style-type: none"> High Frequency X-Ray Generator with 50KHz frequency should be provided. Power of generator should be 5KW or more Maximum mA output should be more than 120mA KV Range should be 20 to 39KV or more in steps of increment of 1 KV each. mas Range should be from 1 mas to 650 mas or more. 	<p>Check the data sheet</p> <p>Check the data sheet</p> <p>Check the data sheet and confirm on the machine</p> <p>Check the data sheet and confirm on the machine</p>	<p>Should comply as per requirement</p>
2	<p>X-RAY TUBE</p> <ul style="list-style-type: none"> A Rotating Anode X-Ray Tube having dual focus should be provided. Focal Spots should be <ul style="list-style-type: none"> Small Focus = 0.1 or better Large Focus = 0.3 or better Target Material: - Molybdenum Anode Heat Storage Capacity should be min 300KHU or more Collimator: Light Beam collimator with bright light source & Auto shut off facility of light source should be provided 	<p>Check the data sheet and confirm the make model of tube and take an undertaking from vendor</p> <p>Check physically on tube head</p>	<p>Should comply as per requirement</p>
3	<p>STAND ASSEMBLY</p> <ul style="list-style-type: none"> A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube & Bucky Assembly should be provided. Vertical Movement (Motor operated). Motorized rotation: +90 degree to -90 degree or more. Source to image distance (SID) should be 600mm or more Switches for up/down movement of Gantry, placed conveniently on both sides of machine frame should be provided. Compression release: Automatic release of Compression if there is Power Failure. 	<p>Check Physically on machine</p> <p>Check Physically on machine</p> <p>Check Physically on machine</p> <p>Check Physically on machine</p>	<p>Should comply as per requirement</p>

Recommendation of Ashwini
Recommendation
Not Recommended
enforced

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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
4	<p>FLAT PANEL DETECTOR (FPD):</p> <p>A complete imaging solution with cutting edge of performance integrated with our X-ray systems should be provided.</p> <p>The detector should be In-direct/direct conversion with A-Si (amorphous silicon) and CsI as scintillator.</p> <p>Size of detector must be 24cm x 30cm or more.</p> <p>Active Image matrix 2.8K x 3K or more</p> <p>Image depth should be min 14bit or better</p> <p>Pixel size should be 85um or less (Smaller pixel size is preferred)</p> <p>Detector resolution should be min 6.0 lp/mm. or better</p>	<p>Check Physically on machine</p> <p>Check Physically on machine/ take an undertaking from the vendor</p> <p>Check data sheet for grid ratio</p> <p>Check physically</p>	<p>Should comply as per requirement</p>
5	<p>ACQUISITION SOFTWARE should have below features:</p> <p>Standard features detail</p> <ul style="list-style-type: none"> • GUI based integrated panel for X-ray & Image parameters control. • Image acquisition, processing & storage in DICOM 3.0 platform • Operating Modes <ul style="list-style-type: none"> ○ APR with manual override ○ AEC dual shot exposure 	<p>Check data sheet</p> <p>Check data sheet</p> <p>Check physically on machine</p>	<p>Should comply as per requirement</p>

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Recommendation of AB&M (Med)

Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	<p>X-ray generator control: -</p> <ul style="list-style-type: none"> • KV & mAs increase/ decrease switches • APR & AEC Mode selection switches • APR for automatic exposure parameters selection as per Fatty, Normal & Dense breast • Focal Spot Large/ Small selection • Filter Mo/ Rh selection • Editing/Save of Exposure parameters, Filter & Focal spot in APR Views 	<p>Check physically on the machines</p>	<p>Should comply as per requirement</p>
7	<p>IMAGE PROCESSING</p> <p>Pre-processing features: -</p> <ul style="list-style-type: none"> • Separate login for manager & technician. • New patient entry manual, Synch with MWL & emergency • Sort of patient data based on day, date, week & Patient ID. • Refresh facility • Total exam counts as per selected period for accepted & rejected images • Lock/Unlock the study for protection & editing. <p>Post processing features: -</p> <ul style="list-style-type: none"> • Image preview time in less than 10sec • Symphony tools for image processing. • KV & mAs stored with image properties • Image reversal-Left to Right & Top to Bottom • Image rotation Clock wise & antic clock wise in 900 step or more • Window width (WW) & Window level (WL) adjustment for brightness & contrast. • Dynamic Zoom with pan • Image Invert / Negative Image • Magnifying Glass • True Image 1:1 • EXI value indication to indicate over/ under exposure • Pre-set multiple image layouts • Reset tab to restore to the default parameters of image 	<p>Check physically on the machines</p> <p>Check physically on the machines</p>	<p>Should comply as per requirement</p>

Recommended on of ADH (mnd)

Recommended by Nst. Rajaram-Perlela

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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
8	<p>Text & Annotation</p> <ul style="list-style-type: none"> • Additional of pre-defined text markers • Addition of user defined text • Addition of Arrow • To clear selected and All annotation from image <p>Measurements Features</p> <ul style="list-style-type: none"> • Length / Distance measurement • Angle measurement • SNR calculation • Mean & median calculation <p>Print Facility</p> <ul style="list-style-type: none"> • Offered software is compatible to connect with normal printer & with dry laser DICOM printer • Customizable user selectable multiple print layout • Print status facility • Mammography specific DICOM print layouts 	<p>Check physically on the machines</p> <p>Check physically on the machines</p>	<p>Should comply as per requirement</p>
9	<p>Connectivity & storage Features</p> <ul style="list-style-type: none"> • Storage of Images on CD/DVD with inbuilt DICOM viewer software enables to view images on any PC. • DICOM 3.0 ready to connect with any DICOM 3.0 modality (like PACS, RIS/HIS/ Dry laser printer) • LAN connectivity to transfer the image to another system. • On line review of Software. • Compatible with BAR Code reader 	<p>Check physically / datasheet</p>	<p>Should comply as per requirement</p>
10	<p>Monitor: 1 No. 19" or more medical display monitor should be provided</p>	<p>Check physically/ take the undertaking from the vendor</p>	<p>Should comply as per requirement</p>

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Recommendation of A.D.S (med)

Recommendation of A.D.S (med)

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
11	POWER SUPPLY REQUIREMENT <ul style="list-style-type: none"> Single Phase, 230 Volts \pm 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. 	Confirm with data sheet	Should comply as per requirement
12	Other Requirements: <ul style="list-style-type: none"> The company should be ISO company with CE Certified products with notified number. The unit should be approved by AERB. The company should have a local Service center. The company should have proven track record in Govt. sector. Firm should provide demonstration /training regarding the equipment at user location. 	Check all the certificates physically Check the list of service center Check the performance certificate.	Should comply as per requirement
13	Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor	Physically check the all certificates / take the undertaking from the vendor.	Should comply as per requirement

7. QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF 1.5T MRI PLANT

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	System should be a Latest, State of the Art, Compact & patient friendly 1.5 Tesla actively shielded Superconducting magnet with Lightweight, ultra-short & External Interference Shielding.	Take undertaking from the vendor	Should comply as per requirement
	Magnet Cooling System:		
	• Helium Capacity: 800 Liters ~ or more,	Check data sheet	Should comply as per requirement
	• Helium Boil off rate: 0.03 liter/hour or less	Check data sheet	Should comply as per requirement

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-X	Member-XI	Member-XII
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Recommendation of ADG (Med)

Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Water-cooled coil and amplifier/air	Check physically	Should comply as per requirement
	Gradients: Resolution Parameters:		
1.	Matrix: 1024	Check data sheet	Should comply as per requirement
2.	FOV: 5 to 50cm	Check physically	Should comply as per requirement
3.	Resolution: Min. Slice Thickness 2D: 0.1mm, Min. Slice Thickness 3D : 0.05mm	Check physically	Should comply as per requirement
	RF system:		
1.	RF system must be fully digital & solid state with transmit power of at least 12kW or more	Check data sheet	Should comply as per requirement
2.	RF System must have necessary hardware to support Phased array coils	Check physically	Should comply as per requirement
3.	RF System must be compatible with parallel imaging techniques. It must be able to support time reductions with compatible coils in 2D/Images in Body/Neuro imaging up to acceleration factor of at least 2 (two) or more.	Check physically	Should comply as per requirement
4.	Number of independent RF Receiver Channels: 16 or more	Check data sheet	Should comply as per requirement
5.	Acoustic Noise level: <90dB	Check data sheet	Should comply as per requirement
6.	Mention Number of RF Channels that MRI system is capable to support for signal processing at a time.	Check compliance	Should comply as per requirement
	RF Coils:		
1.	Main body coil (1) -the main body coil must be integrated to the magnet system	Check physically	Should comply as per requirement
2.	Head & Neck coil (1) -It must be at least 10 elements or more. It must be possible to perform neurovascular study from aortic arch to circle of Willis.	Check physically	Should comply as per requirement

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-X  Member-XI  Member-XII  P.O. 

Recommendation of ADG/med

Recommendation of ADG/med

Recommendation of ADG/med

Appendix-'1(BIL XXV)'

Sl. NO.	SPECIFICATION	PROCEDURE SUGGESTED FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
3.	Spine Coil (1) : For cervical, thoracic and lumbar spine imaging. It must be at least 12 elements or more. It must be possible to do Head and Spine imaging together without changing the coil (either by a combination of coils or a dedicated coil).	Check physically	Should comply as per requirement
4.	Body Coil (1): - Capable of doing abdomen, pelvis & MRCP imaging. It must have at least 16 elements and 50cm along with parallel acquisition techniques	Check physically	Should comply as per requirement
5.	Breast coil 4 Channel.	Check physically	Should comply as per requirement
6.	Dedicated Foot/Ankle 8 channel and above	Check physically	Should comply as per requirement
7.	Dedicated lower extremity/peripheral angio coil: 16 channel and above	Check physically	Should comply as per requirement
8.	Suitable wrist coil (6 channel and above)	Check physically	Should comply as per requirement
9.	Dedicated Knee coil 8 channel and above	Check physically	Should comply as per requirement
10.	Dedicated shoulder coil 6 channel and above	Check physically	Should comply as per requirement
11.	Flexible Coil (I)-Large, medium and Small FOV	Check physically	Should comply as per requirement
12.	Dedicated peripheral coil or whole-body coil with coverage of atleast 60cm (with a maximum combination of 2 Coils)	Check physically	Should comply as per requirement
	Patient Table: The patient table system must be mounted directly to the magnet/ Whole body imaging in both head first & foot first positioning. Scan range should be minimum of 130 cm or more	Check data sheet	Should comply as per requirement
	Range of vertical table movement 52-85 cm or better	Check data sheet	Should comply as per requirement

Recommendation of AD/ (Med)

Recommended by Not Edcom member

Member-I Member-II Member-III Member-IV Member-V Member-VI Member-VII Member-VIII Member-IX Member-X Member-X Member-XI Member-XII P.O.

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Load capacity	Check data sheet	Should comply as per requirement
	Table Side Control	Check data sheet	Should comply as per requirement
	Both Side of the Gantry	Check physically	Should comply as per requirement
	Patient communication & Monitoring: Assistance call squeeze-bulb for patient Intercom communication with the patient.	Check physically	Should comply as per requirement
	Volume of speaker / headphones in examination & control room for voice commands.	Check physically	Should comply as per requirement
	LCD monitor in the console and built in camera in the magnet for viewing the patient	Check physically	Should comply as per requirement
	Physical Measurement Unit (PMU) for wireless physio control	Check physically	Should comply as per requirement
	Acquisition Workpace with single console: For Patient registration & pre-registration, Scanning, Reconstruction, Post-processing, Viewing, Data Storage, Filming Processor: Inter Core 4 or more Duo or equivalent	Check physically	Should comply as per requirement
	Clock rate: 2.2 GHz or higher	Check physically	Should comply as per requirement
	Main Memory (RAM): 12 GB or more	Check physically	Should comply as per requirement
	Hard disk type should be as follows:	Check physically	Should comply as per requirement
	Image Storage Capacity (256 x 256): 900,000 images or more (Without Raw Data)	Check physically	Should comply as per requirement
	DVD-Multi Drive: DVD for long term achieving & CD for individual patient image achieving.	Check physically	Should comply as per requirement

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII	P.O.

Recommended / Not Recommended

Recommended of ADS (med)

Sl. NO.	SPECIFICATION	PROCEDURE SUGGESTED FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Angiography Imaging (PCT/TOF)	Check physically	Should comply as per requirement
	Gradient Motion Re phasing (flow compensation)	Check physically	Should comply as per requirement
	Fat Water Saturation	Check physically	Should comply as per requirement
	Water Excitation technique for fat suppression function	Check physically	Should comply as per requirement
	Parallel Imaging (e.g. ASSET /IPAT/SENSE/SPEEDER/RAPID)	Check physically	Should comply as per requirement
	Multi-slice multi angle capability	Check physically	Should comply as per requirement
	2D Evaluations and quantitative analysis functions	Check physically	Should comply as per requirement
	MIP and MPR	Check physically	Should comply as per requirement
	Perfusion Imaging	Check physically	Should comply as per requirement
	Application packages: Cardiac package: bright and dark blood imaging. Neuro package – for comprehensive head and spine examinations. Must include protocols for diffusion imaging, perfusion imaging, MRS and fMRI Angio package – MR Angiography (Contrast & Non contrast) and Venography.	Check physically	Should comply as per requirement
	Body package – for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, MR Urography. Must allow multi-breath-hold examinations as well as free breathing examinations.	Check physically	Should comply as per requirement
	Protocols for morphology and contiguous coverage of both breasts simultaneously.	Check physically	Should comply as per requirement
	Ortho package – comprehensive protocols for joint and spine imaging.	Check physically	Should comply as per requirement

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Recommendation of ADs (Med)
Recommendation of ADs (Med)

Sl. NO.	SPECIFICATION	PROCEDURE SUGGESTED FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Sound less MRI for all sequences is required, mention the technology name	Check physically	Should comply as per requirement
	Accessories to be supplied:		Should comply as per requirement
	<ul style="list-style-type: none"> • One latest generation laptop for online reporting. (16GB Ram, 1TB hard disc, 13 inch) • Color laser printer (all in one. Scan, copy, print) To be supplied with three tray dry laser printer of above 550dpi. Mention the make of the printer. To be supplied with 10 packets / 1250films of 14x17 size. • Dual Head MRI Compatible Pressure Injector with 200 sets of syringes. • One suitable, 160KVA, silent Diesel Generator with auto switch over and AMF panel. • One non-ferromagnetic height adjustable patient transfer trolley of reputed make. • MRI compatible Fire Fighting System, Detectors with Fire Extinguishers. • Hand held metal detectors (04) • Two metal detector doors to be installed at the entrance points. • Closed Circuit CCD Camera • MR Compatible Oxygen cylinder - 4 nos. • 200 DVD and 10 pen drive (32 GB) • MRI compatible medicine trolley (02), wheel chair (02) • MRI room oxygen deficiency level monitor • MR compatible Non-magnetic IV stand. • Suitable true online UPS unit for 30 minutes power backup during scan. 	<p>Take undertaking from the vendor</p> <p>Take undertaking from the vendor</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p>
	<p>RIS/PACS Connectivity: The system should include necessary connection, image & work list send / receive, image & data storage, scheduling, patient registration, synchronization and reporting functions as per DICOM standards for smooth and effective integration with RIS/PACS</p> <p>Chiller (Dedicated of MR) with soft starter</p>		Should comply as per requirement

Recommendation of Adhmed
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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	RF Cabin for shielding the magnet: Power requirement: 3 Phase 380 to 440 V±10%, not more than 50 KVA Input, Line Frequency : 50Hz ± 1Hz Warranty: Full warranty with Machine for 5 Years & CMC for next 5 years. Or as asked in BOQ. An on-site MRI engineer should be posted exclusively at the facility for the duration of the guarantee period to assist in system maintenance, troubleshooting and research.		
	Quality Standard and Bidders Qualifications: 1. Valid US-FDA/EU-CE/JIS certificate of the offered model must be submitted. 2. IEC 60601-1-1 and IEC 60601-2-33 certificates for the model must be submitted. 3. ISO certificate must be submitted. 4. The bidder/ manufacturer should have supplied and maintained same quality and Brand MRI Machine any Govt. Hospital/ Pvt. Hospital. Certificate in this regard is to be submitted along with offer.	Check all the certificates	Should comply as per requirement
5.	Turnkey Work: - MRI Rooms & Electric Connection of suitable capacity will be provided by the hospital. All turnkey work for MRI room like Floor Tiles, False ceiling, Painting, Chiller Plant, Shielding for Gantry Room, air conditioning and provision of essential furniture like good quality Computer Tables, Revolving Chairs, Patients Chairs etc. shall be done in accordance with offering standard & reputed make products. All related work like civil/Electrical/ Furniture to be done by bidder. (The MRI plant should have following rooms MRI Room & Console Room, Pre-procedure room, Radiologist's Room with attached toilet, separate washrooms for male and female patients.	Take undertaking from the vendor along with financial implication, which should be provided along with the cost of machine.	Should comply as per requirement

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-X  Member-XI  Member-XII  A.O. 

Recommendation of A.D.S (Med)
Recommendation / Not Recommended

8. QRS/ SPECIFICATION & TRIAL DIRECTIVES OF ULTRASOUND WITH COLOR DOPPLER MACHINE

S No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULT EXPECTED / DESIRED
1	<p>TECHNICAL SPECIFICATIONS</p> <ul style="list-style-type: none"> System Should be State of art High End Fully Digital with Broadband digital Beam Former Full-digital ultrasound beam transmission and reception should be available. The high definition ultrasound beams and data processing technology available with full-digital systems allow higher sensitivity and image quality to be achieved simultaneously. The system should have minimum 50000 digitally processing channel The system should have minimum 20 region specific presets like Adult Abdomen, Pediatric Abdomen, TV/TR, Gyn, Small Parts, Musculoskeletal and vascular presets. All Presets should be customized according to the user. The system should have Quick View mode for 2D & CDI Preset selection during exam and minimum 8 sub preset for 2D & CDI Modes All the transducers are broadband with multi frequency capability. Minimum 15 frequency can be selected in combination of different modes System Depth should be minimum 40cm The Monitor size should be more than 19" medical Grade LCD. 	<p>Check data sheet Check data sheet Check data sheet Check physically / data sheet Check physically Check the data sheet Check data sheet Check data sheet Check physically Check physically Check physically</p>	<p>Should comply as per requirement</p>

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Recommendation of ADG (Med)
Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<ul style="list-style-type: none"> The Monitor Display either Normal Display along with Thumbnail view of stored images and option to select Big Image by Large View and Full Screen mode. The freely fully programmable, mode-sensitive more than 8" Color Touch Command Screen enable direct access to all basic and advanced system controls. All Panel keys should customize according to user preferences The system should have single key image optimization for 2D and Doppler The System should High Dynamic range of 180db or more. Higher Dynamic range will be Preferred. The system should have 256 gray scales The System should have Side/ Vertical Display of 2D Images should be possible to improve the Examination Efficiency for Superficial Tissue and MSK Applications. The System should have 3 active Transducer ports. The System should have pulse subtraction / Pulse Inversion Tissue Harmonic Imaging for Better Contrast and Less Side Lobe Artifact 	<p>Check physically</p> <p>Check physically</p> <p>Check data sheet</p> <p>Check data sheet</p> <p>Check physically</p> <p>Check physically</p> <p>Check physically</p> <p>Check physically</p>	

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Recommendation of All (Med)
Recommended (All Recommended)

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<ul style="list-style-type: none"> The System Should be Next Generation Tissue Harmonic Imaging by Transmitting Two Band width of Information and Receiving Difference of Two Band Width and Second Harmonic of Primary Band width Resulting Uniform Image Quality from Near to Far Field and No Need to Select Different Frequencies for Every Patient. The System should select at least Two Levels for Better Matching Frequency Band width. System Should have Receiving End Frequency and Spatial Compound Imaging Technology for, Retaining Clinical Artifact and Compound Imaging Should work all the Probes also Color and Doppler Modes should Possible to Select during Compound Imaging The System should have advanced Real time Spatial Compound Imaging with multiple Levels Selections The system should have new method of signal processing techniques to enhance ultrasound beam data by including information from adjacent lines to allow early identification of diffuse random noise and structural boundaries and to improve resolutions and give uniform homogenous image, and It should be minimum 5 steps selection should be possible. The system should have advanced wide band color Doppler imaging mode with directional in formations without blooming / over painting for low flow applications The System should have Directional Power Doppler Imaging mode. The system should have elastography function and software. The system should have PW Doppler & HPRF mode for All Transducer's. Pw Sample Gate selection should have multiple steps selection should be possible. 		<p>Recommendation of ADG (Med) Recommended/ Not Recommended</p>

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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<ul style="list-style-type: none"> The System should have option of Real time 4D Probe for Radiology and OB Gynae Applications. It should Also Perform Slice View, Volume view, Volume Color, Direct C Plane view. The System should have 3D Imaging for Normal Convex and Linear Probes. 3D Acquisition possible with 2D, Color Doppler, Power Doppler, Wideband Color Doppler. The 3D Mode has Fan Motion operations should be performed. The system should have advanced DICOM for Image Transfer. 		
2	<p>Measurements and Calculations:</p> <ul style="list-style-type: none"> Measurement should be possible on frozen images and Images Recalled from the Image archive. The System should have Comprehensive set of Measurements in OB / Gyn Applications <ul style="list-style-type: none"> Template customization should be possible. EDD should Display all OB Measurements Average US EDD and LMP EDD should display during scanning. LMP GA should display on Monitor screen during scanning. IUGR Graph should be available On Board Report for all Packages – Report transfer to Print Page along with Selected Images through normal PC Printer without any hard ware. 	Check physically	Should comply as per requirement
3	<p>PROBES</p> <p>Following Probes should be supplied along with system:</p> <ul style="list-style-type: none"> Convex probe with bandwidth of 1-6 MHz Volume convex probe with bandwidth of 1-6 MHz TV/TR probe with bandwidth of 4-10 MHz Linear Probe with bandwidth of 5-14 MHz Phase array sector probe for neonatal application with band width of 4-9 MHz 	Check physically	Should comply as per requirement

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Recommendation of All (med) Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
4	<p>STANDARD, SAFETY & TRAINING:</p> <ul style="list-style-type: none"> - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. 	Physically check the all certificates.	Should comply as per requirement
5	<p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	Physically check the all certificates.	Should comply as per requirement

9. QR'S/SPECIFICATION & TRIAL DIRECTIVES OF 500 mA DIGITAL X-RAY MACHINE (WITHOUT FLUOROSCOPY)

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
1	<ul style="list-style-type: none"> • System should be capable of performing exposure in vertical, horizontal and oblique position to perform all skeleton body (upright and lying down) radiographs. • Unit should be completely integrated (integrated generator and Image acquisition) and X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality • It is possible to do all the general radiological imaging like abdomen, musculoskeletal, joints, PNS, Skull and Spine etc. with movement of tube assembly with auto position/auto tracking in vertical position. • Unit should be High frequency Digital Radiography system with rotating anode X-Ray tube. 3D ceiling suspended stand with Auto tracking & 2 separate fixed detectors in table bucky and vertical bucky each. 	To confirm the Generator, Detector and Console software from same manufacturer Check the Data Sheet and Physically and also get the undertaking from the manufacturer. Rest all check Physically	Should comply as per requirement

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Recommendation of ADs/med

Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
2	<p>HIGH FREQUENCY GENERATOR:</p> <ul style="list-style-type: none"> Generator should be of latest technology with high frequency 40 KHz or more X-Ray generator. Power output of 50KW or more KV range should be 40 to 125KV in 1KV/step. mA output: more than 500mA. (500mA at 100KV) mAs range should be from 1mAs to 200mAs or more 	<p>Check the data sheet. Check Physically on console and take x-ray on same parameter</p>	<p>Should comply as per requirement</p>
3	<p>X-RAY TUBE: A Dual focus Rotating anode X-ray tube.</p> <ul style="list-style-type: none"> Focal spots of tube should be: Small focus: 0.6 or less, Large focus: 1.5 or less Large Anode Heat storage capacity of more than 150KJHU. Collimator: Multileaf collimator with LED light source with high lux output. 	<p>Check the data sheet and make model of tube. Check physically collimator</p>	<p>Should comply as per requirement</p>
4	<p>TUBE STAND:</p> <ul style="list-style-type: none"> Ceiling mounted tube stand with 3-dimensional motorized movements of the tube head covering a huge area. Motorized movements in longitudinal, Vertical and transverse direction with control from panel mounted on Tube collimator assembly. Tube stand with actuator based/ telescopic noiseless swift motorized up/down movement Manual Override of Longitudinal & Transverse direction movements with electromagnet locks Tube head Rotation (along vertical axis): $\pm 180^\circ$. Tube assembly should have 3D auto tracking on its control for synchronization with the detector fitted inside the vertical bucky stand & table. 	<p>Check physically.</p>	<p>Should comply as per requirement</p>
5	<p>VERTICAL BUCKY STAND:</p> <ul style="list-style-type: none"> Floor mounted Motorized Vertical bucky stand should have inbuilt FPD (FLAT PANEL DETECTOR) for lung and skeleton x-ray examinations. It should have user friendly design and handling. VB stand should have provision to do chest radiography with and without grid. Motorized Tilting should be -30 degree to + 90 degree. Vertical up Down Movement should be 1200mm or more. 	<p>Check physically on Stand.</p>	<p>Should comply as per requirement</p>

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-X  Member-XI  Member-XII 

Recommendation of Adm. Bd.    

Recommended / Not Recommended 

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	<p>TABLE:</p> <p>Mobile Diagnostic table should be provided.</p> <ul style="list-style-type: none"> Table should be of following dimensions: <ul style="list-style-type: none"> Length: 2000 mm or more Width: 700 mm or more Height from ground: 725 mm or less Locks should be available on front wheels for table stability during exposure. <p>Maximum weight carrying capacity for the table should be 180 Kg or more.</p>	Check physically	Should comply as per requirement
7	<p>FLAT PANEL DETECTOR: Specifications:</p> <ul style="list-style-type: none"> The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator. Size of detector must be 43 cm x 43 cm or more Active Image matrix 3K x 3K or better Image depth should be 14bit or better Pixel size should be 150um or less (Smaller pixel size is preferred) Detector resolution should be more than 3.3 lp/mm DQE (Detector Quantum Efficiency) should be more than 65%. 	Check data sheet of the detector and check material. Also take the undertaking from Vendor.	Should comply as per requirement
8	<p>OPERATING STATION/WORK STATION: X-RAY/IMAGE CONTROL CONSOLE</p> <p>Fully integrated system with following features:</p> <ul style="list-style-type: none"> Digital Display of KV & mAs. KV & mAs increase and decrease control on Graphical user interface Ready and X-Ray ON indication on Graphical user interface. Self-diagnostic Program for error code display of faults such as Earth fault error, KV error, Filament error & Tube's Thermal Overload. An Inbuilt overload protection device. 	Check Physically on Console.	Should comply as per requirement

Recommendation of ADG (M&S)
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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
9	<p>IMAGE ACQUISITION SOFTWARE AND ITS CHARACTERISTICS</p> <p>Software provides complete control of all image capture functions within the examination room. It enhances the entire workflow by delivering diagnostic images instantly. It also allows user to transfer X-Ray images electronically to remote workstations, image archives, and printers, also has an excellent performance on image quality control such as:</p> <p>MAIN FEATURES</p> <ul style="list-style-type: none"> • Digital image processing technology • Preview image in less than 5 seconds. • Exam Specific Algorithms image processing for consistent image quality of all body parts. • Preset image processing tools for different anatomy • Image cropping • Image mirror, rotate. • Image annotation • Add image accept/reject comments • Separate log for Rejected, Accepted and Printed images. • True size for printing. • Hard disc capacity for image storage >3000 images or more • Inbuilt CD/DVD writer facility 	<p>Check Physically on Console.</p>	<p>Should comply as per requirement</p>

Recommendation of Adm(med) at Removable

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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	FULL DICOM 3 COMPATIBILITY <ul style="list-style-type: none"> • Get DICOM work list • DICOM Print • DICOM Store • Support DICOM MPPS 		
10	MONITOR: 1 No. 19" or more LCD/FT/LED monitor should be provided.	Check Physically the size of the monitor	Should comply as per requirement
11	POWER SUPPLY REQUIREMENT: Three Phase, 400 Volts AC 50Hz with line resist 0.2 Ohms. Line Regulation $\pm 10\%$.	Check the data sheet	Should comply as per requirement
12	ACCESSORIES: <ol style="list-style-type: none"> 1. Servo Voltage Stabilizer of Suitable rating 1 NOS. 2. 2 Tray Dry laser Chemistry Printer 1 NOS. 3. Lead Aprons - 02 Nos. 4. LEAD PROTECTION SCREEN 1 NOS. 	Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories	Should comply as per requirement
13	STANDARD, SAFETY & TRAINING: <ul style="list-style-type: none"> - The company should be ISO, EN-ISO& ICMED certified. - The unit should be approved by AERB. - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. 	Physically check the all certificates.	Should comply as per requirement
14	Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor	Physically check the all certificates.	Should comply as per requirement

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-X  Member-XI  Member-XII  P.O. 

Recommendation of Adalmed
Recommended / Not Recommended

10. QRS/SPECIFICATION AND TRAIL DIRECTIVES OF MULTILOADER COMPUTED RADIOGRAPHY (CR) SYSTEM

S.No.	Technical Specifications	Producer Suggest for tail for board of officers	Resulted Expected /desired
1	Specification for the multi loading computed radiography system-for high resolution digital radiography the computed radiography system (CR System) should be made of: - <ul style="list-style-type: none"> ➤ Imaging plates and cassettes ➤ Image reader system. ➤ Preview station/CR console ➤ Patient/cassettes identification ➤ CR work station ➤ Laser Imager 	Check physically	Should comply as per requirement
2.	Imaging plates (IPs) and cassette. CR System compatible imaging plate of following sizes are required. <ul style="list-style-type: none"> • 35 cm x 43 cm=2 nos • 35 cm x 35 cm=2 nos • 24 cm x 30 cm=2 nos • 18 cm x 24 cm=2 nos • Mammography Cassettes of both size 02 cassettes of each size total 04 nos. 	Check Physically and take the undertaking from vendor regarding number of cassettes	Should comply as per requirement
3	Image reader (Multi Loader Image Reader). The model quoted should be of latest version. <ul style="list-style-type: none"> • Multi loader image reader which can stack 4 or more cassettes and have 4 or more input slots with following features: - • It should be able to process all standard size cassettes and imaging plates from 8 x 10 inch to 14 x 17 inch. • It should be able to process mammography cassettes and imaging plates with >15 pixels/mm resolution • Processing capacity should be of 100 or more IPs/ hour of size 35 cm x 43 cm. • Image preview time should be less than 50 sec. • It should have various image processing protocols for respective regions of the body (anatomical presets). • It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement 	Check Physically /Take an undertaking from vendor as applicable	Should comply as per requirement

Recommendation of Adh (med) & Retainment of Adh (med) members

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
4	<p>Preview station/CR Console.</p> <ul style="list-style-type: none"> • Depth acquisition resolution should be 12 bits or more. • Reading sampling resolution should be 5-20 pixel/mm or more for 14" x 17: • It should have ability to route the images to multiple destinations like work stations laser camera etc. • It should have storage capacity of at least 2000 images locally without recourse to a workstation and have capability of retrieving at least last 10 scanned images aspart of contingency plan. 	Check physically	Should comply as per requirement
5	<p>Patient/cassettes identification.</p> <ul style="list-style-type: none"> • Should have bar code reader or another patient/cassettes identification system. 	Check the Physically on demonstration	Should comply as per requirement

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Recommendation of Add'l
Recommended / Not Recommended

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	<p>DEDICATED ADVANCED WORK STATIONS OTHER THAN CONSOLE</p> <ul style="list-style-type: none"> Should have 19 inch or more antiglare flicker free medical grade TFT/LCD flat monitor with at least one mega pixel resolution of standard made like BARCO Should have 320 GB or more storage capacity (hard disk) with 4 GB or more RAM latest high-speed core 2 duo or any other processor of 3.0 GHz or more speed and have CD & DVD burner Should have latest windows based original software It should accept images from, CR reader without loss of any data. It should have built in routine for using predefined image processing parameters for image quality enhancement It should have mechanism for storing the patient image based on name data exam etc. It should have capability of storing user defined image processing parameters capability of overwriting predefined image parameter with user defined parameters & storing these two images separately It should be able to process the raw image data of CR reader and have capability of window level adjustment flipping rotating zooming collimating annotating latitude reduction image noise reduction grey scale saturation feedback electronic shuttering grey scale reversal etc. It should have provision for customized printing formats in different layouts It should have auto routing incoming image to predefined DICOM store or print destination It should have mechanism for printing multiple images in one film with possibility of slide and true size printing It should be able to connect with other DICOM system such as MR work station CT work station etc. 	<p>Check the Physically / take an undertaking as applicable</p>	<p>Should comply as per requirement</p>

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Recommendation of All members
Recommended / Not Recommended

Appendix-'1B(XCIV)'

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
7	<p>Dry Laser Imager</p> <ul style="list-style-type: none"> • A dry laser chemistry imager capable of printing images in high quality • Printing resolution should be 500 DPI or more for all the films size. • Processing capacity should be 100 sheets per hour more of 14 inch x 17 inch • Pixel depth architecture/gray scale resolution should be 14 bits or more • Image resolution/Pixel size should be 100 microns or less • Time required to first print should be less than 100 sec for 14 inch x 17 inch • Film loading system should be daylight film loading and there should be no use of chemicals • It should be able to support at least four standard films size. • It should have at least three film sizes on line. • It should have automatic quality/density control system to maintain the quality of image printing • It should have high speed DICOM print server. • It should have compatibility of networking & connectivity there should be the provision of direct connectivity to any DICOM MODALITY & on installation there should be available essential provision of connection to at least 6 DICOM modalities for high volume centralized USG, CT, MRI, CR, DR, C Arm printing applications • It should be capable of printing in different layouts formats on single films customized layouts & formats should be independent of films sizes. • Image memory should be 512 MB. 	<p>Check Physically/data sheet</p>	<p>Should comply as per requirement</p>
8	<p>SOFTWARE</p> <ul style="list-style-type: none"> • The system should include the following software application as standard • Quality control software. • Software masking of the collimation areas. • Special attention should be placed on pediatric and mammography applications. 	<p>Check physically if possible, otherwise confirm with data sheet and take an undertaking for all software part</p>	<p>Should comply as per requirement</p>

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Recommendation of ADG (Med)
Recommended / Not Recommended by

P.O. 

Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
9.	<p>Standards, Safety and Training</p> <ul style="list-style-type: none"> • Approval will be based on satisfactory demonstration. • Should be FDA or CE. • Manufacturer should have ISO certification for quality standards • Comprehensive training for technical staff and support services till familiarity with the system 	<p>Check the certifications and undertaking</p>	<p>Should comply as per requirement</p>
	<ul style="list-style-type: none"> • Software for printing on any DICOM printer and to print user defined formats and layouts (multiple images on film, true size printing etc.) • Software for storing images on any DICOM (or Newer Versions) complaints stations. • Annotation software advanced annotation features like customizable text arrows and other markers and measurements tools should allow free text to be applied to the image without interfering with the image • Black border/black surround or similar masking software. • It should have provision of processing for expanded visualization for optimal viewing of structures with vastly different densities like DRC EVP or similar. • Grid detection & grid pattern removal software. • Should have built in image processing software. • The CR System should have compatibility of upgradeability of PACS. • The CR System should have a separate online UPS compatible with the unit to take care of power failure for at least 30 minutes backup of the whole system • The CR system should have software security features like user names & password to relevant unauthorized option. • The company should provide demonstration of the quoted equipment and final technical 	<p>Check physically if possible, otherwise confirm with data sheet and take an undertaking for all software part</p>	<p>Should comply as per requirement</p>

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Recommendation of Adb/med
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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
10.	Documentation ➤ User/Technical/Maintenance Manuals to be supplied in English	Compliance/Undertaking need to take form vendor	Should comply as per requirement
11.	Warranty and CMC ➤ 5 years warranty on all supplied items ➤ 5 years annual Comprehensive Maintenance Charge (ACMC) service	Compliance/Undertaking need to take form vendor Compliance/Undertaking need to take form vendor	Should comply as per requirement Should comply as per requirement

11. QRS/SPECIFICATIONS & TRIAL DIRECTIVES FOR 128 SLICE CT SCAN MACHINE/CT ANGIO MACHINE

S. No.	Technical Specification for 128 Slice CT Scan Machine	Procedure suggest for trial for Board of Officers	Result Expected / Desired
1	The system should be latest state of the art, independent 64 or more rows of detectors with acquisition / generation of at least 128 or more slices per rotation capable of integrating with any PACS/HIS system. The system should be DICOM - ready with true isotropic volume acquisition and sub millimeter resolution. The model quoted should be, AERB Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: - <u>Gantry:</u> • Aperture: 70 cms or more and Gantry tilt: ±24 degree or more physical tilt.	Check Product datasheet and console monitor Check desired certifications issued by respective authorities	Should comply as per requirement

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Recommendation of Adh (M)
Not Recommended in our view

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
2	• FOV: 50 cms or more	Check Product datasheet and console monitor	Should comply as per requirement
	• 3-D laser lights for positioning.	Check Product datasheet / physically	Should comply as per requirement
	X-Ray Generator:		
2	• High Frequency type.	Check Product datasheet	Should comply as per requirement
	• Power output: 50 KW or higher	Check Product datasheet	Should comply as per requirement
	• mA Range: 20-300 mA (With incremental steps of 10mA).	Check Product datasheet and console monitor	Should comply as per requirement
3	• KV Range: 80-110 or more	Check Product datasheet and console monitor.	Should comply as per requirement
	X-Ray Tube:		
	• Tube Voltage: 80-110 KV or more	Check Product datasheet and console monitor	Should comply as per requirement
•	Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube	Check Product datasheet	Should comply as per requirement

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Recommeneded / Adh Recommeneded

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
4	<p><u>Patient Table:</u></p> <ul style="list-style-type: none"> Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less. Metal free scan-able range of 150 cm or more. Floating table top with foot pedal/hand control for positioning 	<p>Check Product datasheet and Patient Table / console monitor</p> <p>Check Product datasheet and Patient Table / console monitor</p> <p>Check Product datasheet and Patient Table physically</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p>
5	<p><u>Spiral Acquisition:</u></p> <ul style="list-style-type: none"> Scan Time should be 0.5 sec or less for full 360-degree rotation. Minimum slice thickness should be 0.625 mm or less. Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.56 to 1.5 or more. Specify all possible pitch selections. Bolus Triggered or bolus chase spiral acquisition should be available. Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual. 	<p>Check Product datasheet and console monitor</p> <p>Check Product datasheet and console monitor</p> <p>Check Product datasheet / console monitor</p> <p>Check Product datasheet / console monitor</p> <p>Check Product datasheet / console monitor</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p>
6	<p><u>Image Resolution:</u></p> <p>High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV.</p>	<p>Check Product datasheet</p>	<p>Should comply as per requirement</p>

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Recommendation of Adalmed
Recommendation of Adalmed

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
7	<p>Low contrast resolution – 5mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.</p> <p><u>Data Acquisition System:</u></p> <ul style="list-style-type: none"> Detector- Capable of acquiring/ generating 128 or more slices per 360 degree of rotation. At least 64 or more rows of independent detectors are required with Z-axis coverage of 38 mm or more. Solid state or rare earth detectors of latest technology free from repeated calibration. 	<p>Check Product datasheet and console monitor</p> <p>Check Product datasheet and console monitor</p> <p>Check Product datasheet</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply per requirement</p>
8	<p><u>Image Reconstruction:</u></p> <p>High-speed real-time reconstruction with display matrix of 1024x1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.</p>	<p>Check Product datasheet and console monitor</p>	<p>Should comply as per requirement</p>
9	<p><u>Operator Console:</u></p> <ul style="list-style-type: none"> High resolution medical grade LCD color monitors of 19 inch or more. Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation. Raw Data & Image storage with at least 500 GB Hard disc. System should have image storing capacity of 5,00,000 or more in 512x512 format. 	<p>Check Product datasheet and console monitor physically</p> <p>Check Product datasheet and console monitor</p> <p>Check Product datasheet</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply per requirement</p>

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-XI  Member-XII  P.O. 

Recommendation of ADG (Med) & recommended by Board members

Appendix-'1B(C1)'

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
(iv)	Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction	Check WS Datasheet and quotation	Should comply as per requirement
(v)	Automatic bone Removal facility.	Check WS Datasheet and quotation	Should comply as per requirement
(vi)	Dental CT.	Check WS Datasheet and quotation	Should comply as per requirement
(vii)	Lung nodule evaluation software. CAD for Lung nodule evaluation software should be quoted as optional.	Check WS Datasheet and quotation	Should comply as per requirement
(viii)	Liver segmentation display software in different colours, volume try	Check WS Datasheet and quotation	Should comply as per requirement
5.	Interactive & Automatic Cine display should be available.	Check product datasheet / console monitor	Should comply as per requirement
6.	Image Evaluation Tools:	Check product datasheet / console monitor	Should comply as per requirement
(i)	Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms.	Check product datasheet / console monitor	Should comply as per requirement
(ii)	Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.	Check product datasheet / console monitor	Should comply as per requirement
(iii)	Distance & angle measurement, freely selectable, positioning of co-ordinate system, grid and image annotation.	Check product datasheet / console monitor	Should comply as per requirement

Member-I *jm* Member-II *l* Member-III *Stones* Member-IV *hughey* Member-V *lv* Member-VI *de* Member-VII *de* Member-VIII *de* Member-IX *jm* Member-X *de* Member-XI *de* Member-XII *de*

Recommendation of All Members
Recommended / Not Recommended

Appendix-'1B(CII)'

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
7.	One similar independent post processing stations (workstations, total no. 1) with 01 additional viewing station for Radiologist. The necessary connectivity etc. for proper functioning should be provided by the vendor. All post processing facility and data archiving should be available independently at both the workstations. Must have internal minimum storage capacity of 5,00,000images of 512x512 format.	Check WS datasheet and technical quotation	Should comply as per requirement
	Workstation software / licenses must be from the same manufacturer.	Check product datasheet	Should comply as per requirement
	Check WS datasheet	Should comply as per requirement	Should comply as per requirement
11	Patient communication system:		
1.	An integrated intercom and Automated Patient Instruction System (API) should be provided.	Check product datasheet and physically	Should comply as per requirement
2.	Two closed circuit TV for patient monitoring.	Check technical offer	Should comply as per requirement
12	Dry Laser Imager:		
1.	Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500) Films) of 14x17 inch size along with System.	Check technical offer	Should comply as per requirement
2.	Support Multiple Film Sizes: one of which must be 17"x14"	Check technical offer	Should comply as per requirement
3.	DICOM 3.0 Compatible.	Check technical offer	Should comply as per requirement
13	System Configuration Accessories, spares and consumables:		
	• Collapsible wheel chair with rubberized swivel wheels – 01 no.	Check technical offer	Should comply as per requirement

Recommendation of Adhmeds
Recommended / Not Recommended

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII

R.O.

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<ul style="list-style-type: none"> Standard Patient positioning accessories and restraining devices - 01 set. 	Check technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> Light weight- ZERO LEAD Radiation protection apparels including Aprons -5 Nos. Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos. 	Check technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations 	Check technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup. 	Check technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> Dual Head Pressure Injector with 100 syringes of 200ml. 	Check technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> System must be PACS, HIS/RIS interface ready without any new hardware or software. 	Check Product datasheet and main console / technical offer	Should comply as per requirement
	<ul style="list-style-type: none"> A free comprehensive software update guarantee for entire life of scanner must be provided. 	Check Undertaking submitted by bidder	Should comply as per requirement
1	Warranty: 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.	Check terms and condition submitted by bidder	Should comply as per requirement
4			
1	Comprehensive Maintenance Contract (CMC) for the next five years including all the accessories, Air conditioning and CT Tube.	Check CMC offer submitted by bidder	Should comply as per requirement
5			
16	<p>Instructions to the vendors/suppliers: All companies must give product data sheets confirming the specifications along with the tender. The compliance statement must be filled strictly under the heading given in the tender. Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered.</p> <p>Vendors are requested to see the site for installation of the CT.</p>	Check compliance statement, quotation etc. submitted by the bidder	Should comply as per requirement

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Recommendation of ADG/Chairman
Recommended / Not Recommended

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Appendix-'1B(CIV)'

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
17	AERB site approval: Vendors will support Hospital authorities for getting AERB Site approval, Final responsibility will be of hospital authorities.	Check compliance statement and undertaking submitted by the bidder	Should comply as per requirement
18	CT Room as per AERB Safety Protection Interiors Works- CT scan machine should be provided on Turnkey basis	Check Turn-key quote submitted by the bidder	Should comply as per requirement
1.	Bidders are supposed to visit site before submission of tender.	Check Turn-key quote submitted by the bidder	
2.	Layout plan preparation as per AERB.	Check Turn-key quote submitted by the bidder	Should , comply as per requirement
3.	Interior, Tiling, Electrification International standards.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
4.	Lead lined doors as per AERB Safety Norms.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
5.	Lead Equivalent viewing glass as mentioned in specs with lead framing entire console room.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
6.	Trench up to UPS & Gantry.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
7.	Spilt AC Standard brand 02 Ton total no - 02 1.5 Ton total no - 05	Check Turn-key quote submitted by the bidder	Should comply as per requirement
8.	Earthing up to Electrical panel.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
9.	Exposure warning indication system.	Check Turn-key quote submitted by the bidder	Should comply as per requirement

Requirement (on of Adulmed)
Recommendation
Not Recommended
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Member-I Member-II Member-III Member-IV Member-V Member-VI Member-VII Member-VIII Member-IX Member-X Member-XI Member-XII P.O.

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
10.	MAP Approval by AERB. CT scan complex should consist of CT room, Console room, battery/UPS room, Preparation room for patients, Changing room, Waiting lounge, Separate toilets for ladies and gents, Reporting room for radiologist with attached toilet, Technician room, Store.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
11.	Turnkey bidder must coordinate with OEM/ Installation engineer.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
12.	System interfacing cabling.	Check Turn-key quote submitted by the bidder	Should comply as per requirement
13.	Required furniture (Computer tables, revolving chairs, patient chair) in all the rooms -	Check Turn-key quote submitted by the bidder	Should comply as per requirement

12. QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF DIGITAL PANORAMIC X-RAY UNIT WITH CEPHALOGRAMS / DIGITAL ORTHOPENTOMOGRAM (OPG) X-RAY MACHINE

Sl. No.	TENDER SPECIFICATIONS	Procedures suggested for trial for Board Of Officers	Result expected / desired
1.	Machine Specifications:	Board should check physically / Technical Datasheet during demonstration.	Should comply as per requirement
1.1	The OPG should be a state-of-the-art digital panoramic x-ray unit, should be able to capture panoramic radiographs and various cephalograms		
1.2	It should be floor & wall mounted		
1.3	HF X-ray Generator should be a microprocessor controlled		
1.4	The unit should be compatible with the line voltage of 220+10%, 50 Hz and line current of 2-16A and should have corrector to compensate mains voltage fluctuations automatically.		
1.5	The unit should be fully digital control and user programmable		
1.6	The unit should have an interactive, informative and intuitive 10" or bigger color TFT graphic user interface for technical factors and selected programs digitally displayed and for image preview.		

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Recommendation of Adh (Maid)
Recommended for Recommendation

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1.7	The unit must have a microprocessor-controlled self-control system with clear help guiding to correct use and error messages.		
1.8	The unit should be based on concept of open positioning, i.e. free view to the patient from all directions, three positioning laser beams, easy access also for wheelchair patients and motorized patient positioning and temple supports.		
1.9	The unit should have focal spot size of 0.5 x 0.5mm. Primary collimator, optimized image geometry and constant magnification (it should be adjustable form of focal trough), option for automatic compensation for the cervical, vertebrae shadow.		
1.10	The unit should have two separate inbuilt sensors, one for panoramic imaging and one for cephalometric imaging. The sensor should be CCD/CMOS	Board should check physically / Technical data sheet	Should comply as per requirement
1.11	The imaging software should create DICOM images.		
1.12	The system should have automatic software controlled soft tissue filter.		
1.13	The imaging programs should include:		
1.13.1	Basic panoramic programs like standard panoramic program, lateral double TMJ program, PA double TMJ program, sinus (straight layer) program.		
1.13.2	Advanced panoramic programs like horizontal segmenting, interpromixal panoramic program, orthogonal panoramic program, bitewing panoramic program.		
1.13.3	Various cephalometric views like lateral cephalogram, PA cephalogram		
1.14	The cephalostat should have automatic alignment of radiation source, functionally designed and easy-to-use head positioner, swivelling nasal support, low absorption carbon fibre ear posts, magnification scale.		
2.	Accessories:		
2.1	The supplier should prove a DICOM printer for taking images on film - size 8"x10" or 10"x12"		Should comply as per requirement
2.2	The supplier should provide a online UPS along with the OPG machine and the UPS should provide a power backup for atleast 10-15 minutes for whole system, with maintenance free batteries.	Vendor should submit an undertaking and documents in this regard	
2.3	Ultra light weight lead free aprons - 2 nos.		
2.4	Wall mounted apron stand - 01 no.		

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-X	Member-XI	Member-XII	P.O.

Recommendation of ADG (General)
Recommendation of ADG (Specialist)

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
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2.5	Apron hanger suitable for the supplied aprons, shields (lead free) – 2 nos.		
2.6	Thyroid shields – 2 nos. (lead free)		
2.7	Make and model of all the quoted accessories should be specified		
2.8	All accessories should be from reputed manufacturer		
3.	Standard, Safety and Training:		
3.1	Should be certified product by reputed standards agency european CE / US FDA	Board should check physically all the certificates.	Should comply as per requirement
3.2	It should have AERB approval certification prior installation		
3.3	Manufacturer / Supplier should have ISO certification for quality standards.		
3.4	Installation and regular service and maintenance in every 6 months must be carried out company trained / certified engineers.		
3.5	Electrical safety for Panoramic X-Ray unit should conform to standards for electrical safety IEC-60601/IS-13450	OEM / Vendor should submit an undertaking and documents in this regard	
3.6	The company trained / certified engineers have to train the technician and other staff members of the user department for atleast 3 days following installation of the machine.		
3.7	Vendor should have atleast 2 installations / order copy of reputed Government institutions.		
3.8	Quality Assurance: Quality assurance tests for OPG as per AERB norms to be provided by the Vendor		
3.9	Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor		

13. QRS/ SPECIFICATIONS & TRIAL DIRECTIVES OF PIEZO DIGITAL MAMMOGRAPHY MACHINE

S. no.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
1	Digital Mammography with Tomosynthesis should be microcontroller-controlled machine providing outstanding image quality of breast for 2D and 3D exams. Digital Mammography with Tomosynthesis (3D mammography) should have imaging technique for the screening and diagnosis of breast cancer. It should produce 3-dimensional image of the breast by using several low dose x-rays obtained at different angles to improve the visibility of breast lesions.	Check physically/data sheet	Should comply as per requirement

Member-I *Yes* Member-II *Yes* Member-III *Yes* Member-IV *Yes* Member-V *Yes* Member-VI *Yes* Member-VII *Yes* Member-VIII *Yes* Member-IX *Yes* Member-X *Yes* Member-XI *Yes* Member-XII *Yes* P.O. *Yes*

Recommendation of ADG (med)
Recommendation of ADG (med)

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED DESIRED
2	<p>X-RAY GENERATOR</p> <ul style="list-style-type: none"> - High Frequency X-Ray Generator with 50KHz frequency should be provided. - Power of generator should be more than 4KW. - Maximum mA output should be more than 140mA - KV Range should be 20 to 40KV in steps of increment of 1 KV each. - mAs Range should be from 1 mAs to 650 mAs or more. - 1 No. High Voltage Cable should be provided. 	Check physically/data sheet	Should comply as per requirement
3	<p>X-RAY TUBE</p> <ul style="list-style-type: none"> - Biangular, Rotating Anode X-Ray Tube having dual focus should be provided. - Focal Spots should be <ul style="list-style-type: none"> Small Focus = 0.1 Large Focus = 0.3 - Target Material: Tungsten, Rhenium and Molybdenum - Inherent Filtration should be more than 0.50mm Be - Anode Heat Storage Capacity should be more than 200KHU. - Added Filtration: Rhodium and Aluminium - Collimator: Light Beam Collimator for 24cmx30cm field size with Auto shut off timer. Cone for Radiation Protection. 	Check physically/data sheet	Should comply as per requirement
4	<p>PANEL</p> <p>ACQUISITION SOFTWARE: Integrated panel for control of Exposure parameters as well as image parameters.</p> <p>OPERATING MODES:</p> <ul style="list-style-type: none"> • APR Modes for automatic selection of Exposure parameters (KV & mAS) as per Fatty, Normal & Dense breasts with manual override to select parameters manually. • AEC mode (Dual shot) for automatic selection of exposure parameters. Automatic density selection as per breast anatomy for optimum Image quality. 	Check physically/data sheet	Should comply as per requirement

Member-I *[Signature]* Member-II *[Signature]* Member-III *[Signature]* Member-IV *[Signature]* Member-V *[Signature]* Member-VI *[Signature]* Member-VII *[Signature]* Member-VIII *[Signature]* Member-IX *[Signature]* Member-X *[Signature]* Member-X *[Signature]* Member-XI *[Signature]* Member-XII *[Signature]* P.O. *[Signature]*

Recommendation of Addg/med

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
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	<ul style="list-style-type: none"> • 3D TOMOSYNTHESIS MODE Three scan modes i.e. Standard tomo, High definition Tomo& Ultra high definition for tomo images <ul style="list-style-type: none"> ○ +/-15 degree scan angle for tomo images with 1 degree each exposure & 2degree each exposure ○ +/-7.5 degree scan angle for tomo images with 1 degree each exposure <p>DIGITAL DISPLAY: Parameters displayed on the monitor screen:</p> <ul style="list-style-type: none"> • KV • mAs • Interlocks indicating the fault in the machine • Filter selected • Focal spot selected • Compression force (In Newton) • Compressed Breast Thickness (in cm) • Gantry angulations (in degree) <p>Generator controls in Acquisition system software:</p> <ul style="list-style-type: none"> • Exposure mode (Manual / AEC / Tomo) selection switch • KV selection • mAs selection • Large / Small Focal spot selection • Filter selection <p>Switches on the Gantry:</p> <ul style="list-style-type: none"> • Compression up - down switch • Gantry up - down switch • Gantry angulations switch • 2 Nos. of "Emergency OFF" switches provided on each side of machine to shut down the machine in case of emergency. 		
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Recommendation of ADG (med)
Recommendation not recommended

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII	P.O.
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Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
5	<p>Switches on Control Panel:</p> <ul style="list-style-type: none"> • ON / OFF Key switch • Emergency OFF switch • Compression release switch • LBD ON / OFF switch • Exposure switch <p>ACQUISITION SYSTEM:</p> <p>j) SOFTWARE SPECIFICATIONS</p> <ul style="list-style-type: none"> • Integrated panel for control of Exposure parameters as well as image parameters <p>Standard Features Detail: -</p> <ul style="list-style-type: none"> • Dedicated Imaging software for Image acquisition provides complete control of all image capture functions & exposure factors controls within the examination room. • Enhances the entire workflow by delivering diagnostic images instantly. • Allows user to transfer X-Ray images electronically to remote workstations, image archives, and printers. <p>X-Ray Generator Control: -</p> <ul style="list-style-type: none"> • KV & mAS increase/ decrease switches • Manual & AEC Mode selection switches • APR Mode with Manual Override for automatic exposure parameters selection as per Fatty, Normal & Dense breast • Focal Spot Large/ Small selection • Exposure ON Indication <p>Pre-Processing Features: -</p> <ul style="list-style-type: none"> • Separate log in for Manager and Technician. • DICOM Modality work list for the patient details • Manual & Emergency Patient details Entry • Exam Specific Algorithms image processing for consistent image quality of Breast. • Image processing tools for different anatomy for 2D images. 	Check physically/data sheet	Should comply as per requirement

Recommendation of A.D.S. (Med) Recommended

Not Recommended

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- [Signature]* Member-I
- [Signature]* Member-II
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Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED DESIRED
	<p>Post Processing Features (for 2D image): -</p> <ul style="list-style-type: none"> • Symphony tools for image processing for 2D image. • Add image accept/reject comments • Rejected images archival with provision of converting them to Accepted images. • Image mirror & Flip, Image rotation in steps & in 90 degree steps. • Dynamic Zoom with PAN • Negative Image • True Image & Fit to screen • Brightness & Contrast adjustment with change of Window width & Window level • DICOM Tags/Information view • EXI value indication to indicate Normal, over/ under exposure • Protect/ Un-protect the patient study. <p>Post Processing Features (for 3D image): -</p> <ul style="list-style-type: none"> • Display of Current frame and total frame count. • Play, Pause, Preview & Next Frame for easy Access. • Play Speed Control with 1, 5, 10, 15, 20,30& 60 FPS. • Change of Window Level. • Zoom & Magnify feature. • Annotation • Clear Annotation Button to clear annotations from the image. • Measurements Features • Ruler measurement • Angle measurement <p>Image Print: -</p> <ul style="list-style-type: none"> • User defined print settings. • Selection of different film sizes • Tagged Image Print on Normal printer & on DICOM printer • Connectivity & storage Features 		

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-X  Member-XI  Member-XII  Member-XIII  P.O. 

Recommended / Not Recommended

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
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	<ul style="list-style-type: none"> Storage of 3D Loops on CD/DVD DICOM 3.0 ready to connect with any DICOM 3.0 modality (like PACS, RIS/HIS/ Dry laser printer) 		
	<p>ii) HARDWARE SPECIFICATIONS</p> <p>Operating System: Windows 7 Pro 64 Bit or higher</p> <p>Hardware Characteristics</p> <ul style="list-style-type: none"> 24 GB RAM Processor i7 / latest 1 TB HDD (or higher specifications) 1 Nos. compatible wired keyboard 1 Nos. compatible wired mouse Ethernet 10/100/1000 MBPS CD/DVD RW 4 x USB 3.0 UPS 3 KVA <p>Display/Screen/Monitor: 19" Medical Display Monitor 1 MP (Resolution: 1280 x 1024).</p>		
6	<p>ADDITIONAL REPORTING WORKSTATION:</p> <p>1no. 19" monitor for work list & 21" Medical display grey scale Dual Head 5MP monitors compatible for 3D Images views.</p>	Check physically/data sheet	Should comply as per requirement
7	<p>STAND ASSEMBLY</p> <p>-A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube & Bucky Assembly should be provided.</p> <p>- Vertical Movement (Motor operated) should be 800mm or more.</p> <p>- Motorized rotation: +180 degree to -180 degree or more</p> <p>- Source to image distance (SID) should be 650mm or more</p> <p>- Magnification Factor: 1.8x</p> <p>- Protection Barrier: Free standing fully transparent lead glass for operator protection</p>	Check physically/data sheet	Should comply as per requirement

Member-I *Yu* Member-II *[Signature]* Member-III *[Signature]* Member-IV *[Signature]* Member-V *[Signature]* Member-VI *[Signature]* Member-VII *[Signature]* Member-VIII *[Signature]* Member-IX *[Signature]* Member-X *[Signature]* Member-XI *[Signature]* Member-XII *[Signature]*

Recommendation of ADG (med)

Recommendation of Joint Committee

Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
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Appendix-'1B(CXIV)'

10	<p>POWER SUPPLY REQUIREMENT</p> <ul style="list-style-type: none"> - Single Phase, 230 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. - Suitable rating UPS should be provided for the backup of software & Complete system. <p>OTHER REQUIREMENTS:</p> <ul style="list-style-type: none"> • The company should be ISO & ICMED certified with European CE Certified products with notified number. • The unit should be approved by AERB. • The company should have a local Service center. • The company should have proven track record in Govt. sector. • X-Ray generator, detector & software should be from same manufacturer for seamless connectivity and consistent image quality • Firm should provide demonstration /training regarding the equipment at user location. 	Physically check the all certificates.	Should comply as per requirement
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(Dr. J Chalopadhayay) BSF Member-I

(Dr. Rohit Shyam Bobli) CMO(SG) (ENT) RH, ITBP, Gr. Noida Member-II

(Dr. Sagarb Khan) CMO (OG) (Radiology) CRPF, Member-III

(Dr. Rikuppu Samy) CMO(SG) (Paediatrics) CRPF Member-IV

(Dr. Chandrima Kar) Comdt /Spl. Gr.I & (Obs Gyn), CRPF Member-V

(Dr. Anurag Jain) Contractual, Spl (Orthopaedics), CRPF Member-VI

Recommendation of Asst Commr

(Dr. A C Bhardwaj) TG (Med.), RH, ITBP, Gr. Noida Presiding Officer

Recommended / Not Recommended

Approved / Not Approved

DIRECTOR GENERAL BORDER SECURITY FORCE