

#### Appendix-'1B(i)'

SM 02

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

No.	-1	2.	3				4.						5.	6.		7.		8.	
Name of the Equipment	100 mA X-RAY MACHINE	300 mA X-RAY MACHINE	1000 mA DIGITAL X-RAY	MACHINE			CT- 64 ANGIO DETECTOR						DEXA BONE DENSITOMETRY	MAMMOGRAPHY MACHINE		1.5 TESLA MRI PLANT		USG WITH COLOUR DOPPLER	
Is available in PET (as per 100 bedded) If yes then mention S.No of PET	Yes , S.No - 27	No	No,	But Available in PET of 200 bedded	hospital between S.no. 13 and 14. No	serial no. is assigned	No .						Yes, S. No - 29	Yes, But available in PET of 50 bedded	hospital at 5.No - 32	No, But 3 tesla MRI Available in PET of Yes	200 bedded hospital at S.no 22	Yes, But available in PET of 50 bedded	hospital at S.No - 30
QR's available or not	Yes	Yes	Yes			0	Yes .						Yes	Yes		Yes		Yes	
Remarks	Annexure-I						Annexure-	CT machine having 64 detector rows is able to take 128 slices per 360° rotation. Hence to be labelled	QR's are separately attached at SI.  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							



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

Member-III Member-IV Member-V Member-VI Member-VII Member-VIII Member-IX | Member-X | Member-XII | Member-XII

Recommended Not recommended from

<ul> <li>The X-Ray generator, detector and console software should be manufacturer for seamless connectivity and consistent image quality.</li> <li>Touch screen tablet for instant review of image.</li> <li>Compact and light weight.</li> </ul>	<ul> <li>The X-Ray generator, detector and consmanufacturer for seamless connectivity and</li> <li>Touch screen tablet for instant review of ima</li> <li>Compact and light weight.</li> <li>GENERATOR &amp; TUBE  X-Ray Generator Type: High frequency microp 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  Maximum mA: 1-200 mAs</li> </ul>	Du:  Du:  Pop  Maa  Maa  Du:  Pop  Maa  Maa				
tivity and consistent image quality. iew of image.	ew of image.  lew of image.  lcy microprocessor controlled  tter  1 KV/step.		ew of image.  ew of image.  cy microprocessor controlled  tter  1 KV/step.  4 should be provided. The mono-block shormer, filament transformer, H.V. rectifiers de oil with high dielectric strength. Mono-block shormer overload.	ew of image.  lew of image.  cy microprocessor controlled  tter  1 KV/step.  d should be provided. The mono-block shormer, filament transformer, H.V. rectifiers de oil with high dielectric strength. Mono-blere	ew of image.  Iter  I KV/step.  Should be provided. The mono-block shormer, filament transformer, H.V. rectifiers de oil with high dielectric strength. Mono-blermal overload le sium lodide (Csl)	iew of image.  iew of image.  iew of image.  icy microprocessor controlled  itter  1 KV/step.  d should be provided. The mono-block shormer, filament transformer, H.V. rectifiers ide oil with high dielectric strength. Mono-block shormer le  isium lodide (CsI)
	Check data sheet and physically.					
Charles comply	as per requirement	as per requirement  Should comply as per requirement	as per requirement  Should comply as per requirement Should comply as per requirement requirement requirement	as per requirement  Should comply as per requirement Should comply as per requirement requirement as per requirement	as per requirement  Should comply as per requirement Should comply as per requirement requirement  Should comply as per requirement	Should comply as per requirement
quency microprocessor controlled Check data sneet and		Dual action hand switch & IR remote for ready & Exposure should be provided. Check Physically	X-Ray Tube Head:  Mono-block version x-ray tube head should be provided. The mono-block should capacitors, all immersed in high grade oil with high dielectric strength. Mono-block  Tube Head:  Check Physically  And Check Physically  Check Physically  Check Physically	X-Ray Tube Head: - Mono-block version x-ray tube head should be provided. The mono-block should 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	X-Ray Tube Head: - Mono-block version x-ray tube head should be provided. The mono-block should 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 Conversion screen/ Scintillator: Cesium lodide (Csl)  Check data sheet and tube make model tube make model to the m	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  Conversion screen/ Scintillator: Cesium lodide (CsI)  Check data sheet and tube make model tube make model to the make model to the conversion screen/ Scintillator: Cesium lodide (CsI)

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Recommendation of ADU(med)	Actil Member-III Member-IV Member-VI Member-VII Member-VIII Member-IX Member-IX	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	STANDARD, SAFETY & TRAINING (OTHER REQUIREMENTS): 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.	Power Supply:  1-Phase 230V (AC-supply) 50/60 Hz, ±10% with automatic compensation  15 Ampere wall socket	<ul> <li>Tube Head rotation of +/-90° along horizontal axis &amp; +90° to -30° or better along tube axis</li> <li>Weight of the machine should be 150 kgs or less</li> <li>Min height should be 150 cm or less</li> </ul>	a mobile stand designed keeping in mobility, light in weight & easy This mobile stand should be made to ng unparallel reliability. Tube stand lock should be provided to lock the	SPECIFICATION
/	Member-X Member-X	Physically check the all certificates.	Physically check the all certificates.	Check data sheet and physically Check data sheet and physically		Check data sheet and physically	FOR TRAIL FOR BOARD OF OFFICERS
	Member-XII Member-XII	per requirement		Should comply as per requirement		Should comply as per requirement	EXPECTED/ DESIRED

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

SPECIFICATION  PROCEDURE SUGGEST  RESULTED  FOR TRAIL FOR BOARD  FOR TOTAL FOR SPACE  FOR TOTAL FOR SPACE  FOR TOTAL FOR BOARD  FOR TOTAL FOR SPACE  FOR TOTAL FOR BOARD  FOR TOTAL	7	>		<ul> <li>Height of the stand: 2200 mm or Less</li> <li>Longitudinal movement of column on track: 1900 mm or more</li> <li>Total up/down movement of the tube head: 1300 mm or more.</li> <li>Tube rotation: ±180 degree</li> </ul>	
Unit should be specifically designed for all aspects of general X-Ray imaging of FOR TRAIL FOR BOARD DESIRED  Unit should be specifically designed for all aspects of general X-Ray imaging of FOR TRAIL FOR BOARD DESIRED  Unit should be specifically designed for all aspects of general X-Ray imaging of FOR TRAIL FOR BOARD DESIRED  Unit should be specifically designed for all aspects of general X-Ray imaging of FOR TRAIL FOR BOARD DESIRED  Unit should be specifically designed for all aspects of general X-Ray imaging of the machine generator. Check Data Sheet for 50 Should comply efficient X-ray generator. Console software from detector and console software should be from same manufacturer for seamless the Data Sheet and Physically and also get the undertaking from the undertaking		as per requirement	Check physically on Stand.	Tube Stand with Counter Balanced Tube Head with following features should be provided	04
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 allows the operator to acquire X-ray image Quality. The Integrated Design of the machine detector and console software should be from same manufacturer for seamless the Data Sheet for 50 Should comply as per generator, connectivity and consistent image quality. X-Ray generator, connectivity and consistent image quality.  IIGH FREQUENCY GENERATOR:  • Generator should be of latest technology with high frequency 50 KHz  • Constant Power output of 30 KW or more  • Max range should be 40 to 125 KV or more in 1 KV/step  • Max range should be 1 to 200 mAs or more  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • Constant Power output of 30 KW or more in 1 KV/step  • Max range should be 1 to 200 mAs or more  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating anode X-ray tube should be provided.  • Constant Power output of 30 KW or more in 1 KV/step  • A Dual focus Rotating anode X-ray tube should be provided.  • A Dual focus Rotating and a so get the undertaking from the frequirement physically and also get the undertaking from the manufacturer.  Should comply as per factor of the machine to the form and to confirm the requirement physically and also get	1-	Should comply		Multi leaf Collimator having halogen lamp / bright light source and auto shut provision of the light.	
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 Generator 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.  IIGH FREQUENCY GENERATOR:  Generator Should be of latest technology with high frequency 50 KHz and to confirm the as per Generator. Console software from same manufacturer for seamless the Data Sheet and Physically and also get the undertaking from the manufacturer.  IIGH FREQUENCY GENERATOR:  Generator Should be of latest technology with high frequency 50 KHz and console software and Physically also on console software from the Physically also on console software and Physically also on console software		should comply as per requirement	Check the data sheet of x-ray tube	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 kHII or more	03
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 detector and console software should be from same manufacturer for seamless connectivity and consistent image quality.  IIGH FREQUENCY GENERATOR:  • Constant Power output of 30 KW or more  PROCEDURE SUGGEST EXPECTED/ OF OFFICERS  OF OFFICERS  Check Data Sheet for 50 Should comply KHZ and to confirm the as per Generator, Detector and Console software from A symmetry of the machine console software from Console software from Console software from Physically and also get the undertaking from the manufacturer.  Should comply as per Generator Should comply with high frequency 50 KHz physically also on console of the machine Console software from Console software from Physically and also get the undertaking from the manufacturer.  Should comply as per Generator Should comply as per requirement console of the machine Console software from the manufacturer.  Should comply as per requirement console of the machine Console software from the manufacturer.  Should comply as per requirement console of the machine console of the machine console as per requirement and physically and also get the undertaking from the manufacturer.  Should comply as per requirement console of the machine console	1	12		<ul> <li>KV range should be 40 to 125 KV or more in 1 KV/step</li> <li>mA output: 300 mA or more</li> <li>mAs range should be 1 to 200 mAs or more</li> </ul>	
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 detector and console software should be from same manufacturer for seamless connectivity and consistent image quality.    IGH FREQUENCY GENERATOR:   Generator Should be of latest technology with high frequency 50 KHz   Check in data sheet and sequence in the production and preeminent Image quality.   PROCEDURE SUGGEST EXPECTED/    Check Data Sheet for 50 Should comply as per requirement console software from same manufacturer for seamless the Data Sheet and Physically and also get the undertaking from the manufacturer.	100	/ requirement	physically also on console	X-Ray generator     Constant Power output of 30 KW or more     300mA at 100 KV	
Unit should be specifically designed for all aspects of general X-Ray imaging 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 detector and console software should be from same manufacturer for seamless the Data Sheet and Physically and also get the manufacturer.  PROCEDURE SUGGEST EXPECTED/ OF OFFICERS  Check Data Sheet for 50 Should comply as per requirement console software from same manufacturer for seamless the Data Sheet and Physically and also get the manufacturer.		Should comply as per	Check in data sheet and	Generator should be of latest technology with high frequency 50 KHz	02
Unit should be specifically designed for all aspects of general X-Ray imaging 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, console software should be from same manufacturer for seamless same manufacturer Check	- PO		the Data Sheet and Physically and also get the undertaking from the manufacturer.	connectivity and consistent image quality.	. ~
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS		Should comply as per requirement	Check Data Sheet for 50 KHZ and to confirm the Generator, Detector and Console software from same manufacturer Check	Unit should be specifically designed for all aspects of general X-Ray in and operating at a High Frequency of 50 KHz for highly efficient production and preeminent Image Quality. The Integrated Design of the mallows the operator to acquire X-ray Images very conveniently. X-Ray gen detector and console software should be from same manufacturer for sea	
		EXPECTED/ DESIRED	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	SPECIFICATION	S NO.

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Member-IX | Member-X | Member-XI

Member-XII

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-	1. 19			Appendix 10(VEAIII)
1	S NO.	SPECIFICATION	PROCEDURE	RESULTED FXPFCTFD/
			TRAIL FOR BOARD OF OFFICERS	DESIRED
	05	Detector Stand,	Check physically on Stand.	Should comply as per requirement
		<ul> <li>Up /down travel of Bucky: 1300mm or more</li> <li>Bucky tilting angle: 0° to 90° or more to be provided</li> <li>Removable grid should be provided</li> </ul>		
	06	TABLE:  Mobile Diagnostic table should be provided.		Should comply as
		Table should be of following dimensions:     Length: 2000 mm or more	Check physically	per requirement
		<ul> <li>Wjdth: 700 mm or more</li> <li>Height from ground: 725 mm or less</li> <li>Locks should be available on front wheels for table stability during exposure.</li> </ul>		
	07	FLAT PANEL DETECTOR: Specifications:		~
		The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator.	Check data sheet of the detector and check	Should comply as per requirement
		<ul> <li>Size of detector must be 43 cm x 43 cm or more</li> <li>Active Image matrix 3K x 3K or better</li> </ul>	material.	
		Image depth should be 14bit or better      Divel size should be 150 um or less (Smaller pixel size is preferred)	undertaking from	
				-
	3 -	DQE (Detector Quantum Efficiency) should be more than 65%.      TATION STATION.		Should comply as
	08	X-RAY/IMAGE CONTROL CONSOLE	Check Physically on	per requirement
		Fully integrated system with following features:  - Digital Display of KV &mAs.	Console.	
	-	<ul> <li>KV &amp;mAs increase and decrease control on Graphical user interface</li> <li>Ready and X-Ray ON indication on Graphical user interface.</li> </ul>		
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STANDARD, SAFETY & TRAINING:  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.	ACESSORIES:  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.	POWER SUPPLY REQUIREMENT: Three Phase, 400 Volts AC resist 0.2 Ohms. Line Regulation ±10%.	MONITOR: 1 No. 19" or more LCD/TFT/LED monitor should be provided	DICOM 3 COMPATIBILITY  Get DICOM work list  DICOM Print  DICOM Store  Support DICOM MPPS	True size for printing. Hard disc capacity for image storage >3000 images or more Inbuilt CD/DVD writer facility	SPECIFICATION
		50Hz with line	ovided.		nore	
Physically check the all certificates.	Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories	Check the data sheet	Check Physically the size of the monitor			PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
	Should comply as per requirement	Should comply as per requirement	Should comply as per requirement			RESULTED EXPECTED/ DESIRED
	Physically check the all certificates.	Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories  Physically check the all certificates.	Check the data sheet Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories  Physically check the all certificates.	Check Physically the size of the monitor per requirement Check the data sheet check the offer and take the undertaking per requirement from vendor. In offer make and model has to be mention of all accessories  Should comply as per requirement per requirement per requirement should comply as per requirement per requirement per requirement per requirement per requirement should comply as per requirement per requi	Check Physically the size of the monitor  Check the data sheet  Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories  Physically check the all certificates.	Check Physically the size of the monitor  Check the data sheet per requirement  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 per requirement  Should comply as per requirement per requirement.

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

NO.	01.	02.				
SPECIFICATION	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.	<ul> <li>X-RAY GENERATOR:</li> <li>High Frequency X-Ray Generator of frequency should be provided.</li> </ul>	Power output of generator should be 80 KW or more	KV Range should be:     Radiographic KV: 40 to 150 KV or more     Fluoroscopic KV: 40 to 120 KV or more	mA Range (Rad.): 1000 mA or more	<ul> <li>mA Range (Fluoroscopy): Normal Fluoro. Mode: - up to 40 mA or more</li> <li>HD/Boost Flouro/Cine mode: - up to 70mA or more</li> <li>Exposure time (Rad.):1 ms to 2 Sec or more.</li> <li>Cumulative flouro. timer to cut off exposure</li> <li>mAs Range (Rad.): 1 to 200 mAs or more.</li> </ul>
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	All the Parameters check Physically and also check the datasheet of Generator, Detector and Software all three from same manufacturer.	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
EXPECTED / DESIRED	Should comply as per requirement  Recommoderation	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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Member-VIII

Member-IX | Member-X | Member-X | Me

Member-XII

ECIFICATION  PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS  NTROL:  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.  Exposure parameters & Check Physically on console  Check Physically on console  Check Physically on console  Self-diagnostic Programme with Indicators for Phase failure error, KV error, console  Preprogrammed parameters of human Anatomy > 150 programs which helps console  Check Physically on console
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS  Check the operating console Check Physically on

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NO.	SPECIFICATION	FOR TRAIL FOR BOARD OF OFFICERS	EXPECTED / DESIRED
05.	OLLIMATOR:     1 No. Motorized Square/ Rectangular collimator having bright light source and auto shut provision of the light. Preview collimation should be provided on table side	lly on Tube	Should comply as per requirement
	<ul> <li>1 no. manual collimator having bright light source and auto shut provision on the ceiling stand for 2<sup>nd</sup> tube should be provided</li> </ul>	Check Physically on Tube	
		Check Physically on Tube and table	
06.	Remote controlled, motorized RF Table should be provided. Table should have integrated console. Table should have scratch resistant tabletop.	Check Physically on table	Should comply as per requirement
	<ul> <li>Table should have soft start and stop with following minimum features.</li> <li>Motorized Tilt: Vertical +90° to -90° or more Trendelenberg.</li> </ul>	Check Physically on table	
	forizontal & Vertical position during tilt	Check Physically on table Check Physically on table	
¥	Transverse movement of tabletop: 20 cm or more	Check Physically on table	
	Table with height adjustment facility	Check Physically on table	
	Motorized Longitudinal movements of imaging unit i.e. Tube column – detector movement: 100 cm or more.	Check Physically on table	
	Tube Oblique movement	Check Physically on tube	
	lat panel detector for general radiography and	Check Physically on table	
	Remotely operated compression device.	Check Physically on table/console	The second
6,	Foot switch for releasing fluoroscopy and acquisition.	Check Physically on table side	
	Patient weight carrying capacity: 200 kg or more	Check Physically on table	
	Intercom system to communicate with the patients.	Check Physically on table/console room	>
		Church	No. of the second
Mistribet-1 IN	of ADG(med)		
	Recommended / Not Recommended		

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<ul> <li>Advance features: Flouro and Cine</li> <li>AEC for Radiography</li> <li>Auto Sync of Software and Hardware in case of Power failure.</li> <li>Configurable RF procedures and RAD APR protocols.</li> </ul>	Frames per second: Flouro& Cine: up to 15 FPS	IMAGE ACQUISITION SOFTWARE should have following features available Exposures mode: RF (Flouro, Cine and Spot) and DX (Radiography	DQE:65% or more at 0 lp/mm.	Detector resolution should be more than 3.3 lp/mm.	Pixel size: 140 µm or less.	A/D conversion: 16 bits	Image matrix size: 3K x 3K or more	Size of detector: 43 x 43 cm or more	FPD should have following specifications or better Receptor type: Amorphous Silicon Scintillator: Cesium iodide (Csl)		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.	SPECIFICATION
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			undertaking irom veridor	detector and take an	Confirm with data sheet of	Check physically	Confirm with data sheet of detector and take an undertaking from vendor		Check physically	FOR TRAIL FOR BOARD OF OFFICERS
per requirement		per requirement	Ch. Li						per requirement	Should comply as	Should comply as per requirement	EXPECTED / DESIRED

Member-II Member-IV Member-V Member-VI Member-Recommended / slot Recommended Member-VIII

Member-I

Member-X Member-X

Member-XII Member-XII

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Tube head Rotation (along Horizontal axis): ±135°.	<ul> <li>Tube head Rotation (along with Column axis): ±180°.</li> </ul>	<ul> <li>Motorized Vertical up/down movement motorized: more than 1400 mm</li> </ul>	Motorized Transverse movement more than 1800mm	Motorized Longitudinal movement more than 2800mm	Movements of stand should be:	movements. It should have Tube Head Rotation along its axis.	<ul> <li>Stand should have motorized Longitudinal, Transverse and vertical</li> </ul>	head should be provided.	covering a huge area. Noiseless and swift up/down movement of the tube	stand providing the user three-dimensional movements of the tube head	Motorized 3D- Ceiling Suspended tube stand should be a new generation	CEILING SUSPENDED TUBE STAND:	Fully compatible with 3.0 DICOM standard	DICOM COMPATIBILITY:	Angle and Length Measurements	Tagging of images	Software shutters/crop	<ul> <li>Cine loop Play with frame by frame image view</li> </ul>	Multiple Image Layouts	Annotations	Image Flip Horizontal & Vertical	Image Invert (Negative)	Magnify	Zoom with PAN	<ul> <li>WL/WW (Manual &amp; Automatic) adjustment in LIVE &amp; in LIH Image</li> </ul>	Live Image WL/WW adjustment	Post processing:		SPECIFICATION
										on	suspended tube. Physically	movements on Ceiling											Station	console/operating work	Physically on	Check all the features		OF OFFICERS	FOR TRAIL FOR BOARD
												per requirement	Charlet comply of								STATE OF THE PARTY					per requirement	Should comply as	DESIRED	EXPECTED /

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SPECIFICATION	<ul> <li>VERTICAL BUCKY STAND:</li> <li>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.</li> <li>VB stand should have provision to do chest radiography with and without grid.</li> <li>Motorized Tilting should be -30 degree to + 90 degree.</li> </ul>	<ul> <li>Vertical up Down Movement should be 1200mm or more.</li> <li>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</li> </ul>	exposure classes/densities.	<ul> <li>Specifications:</li> <li>The detector should be flat panel type with A-Si (amorphous silicon) and Csl as scintillator.</li> <li>Size of detector must be 43 cm x 43cm.</li> <li>Active Image matrix 3K x 3K.</li> <li>Image depth should be 14 bit or more.</li> </ul>	<ul> <li>Pixel size should be 140 um or less (Smaller pixel size is preferred)</li> <li>Detector resolution should be more than 3.3 lp/mm.</li> <li>DQE (Detector Quantum Efficiency) should be more than 65%.</li> </ul>	<b>MONITORS:</b> 2 Nos. monitors. of size of 27", or more One in examination room integrated on trolley and 2 <sup>nd</sup> in console room with resolution of 1920 x 1080 pixels or more should be provided.	Additional reporting workstation with 19" or more Medical display monitor with below feature is provided  Advance Features: -  DICOM Store  DICOM Print  Job Queue
FOR TRAIL FOR BOARD OF OFFICERS	Check all the features/ movements on vertical bucky stand it must have fix detector not wifi and AEC on Console also		Confirm with data sheet of	undertaking from vendor and size of the detector should check physically		Check Physically	Check Physically
EXPECTED / DESIRED	Should comply as per requirement		Should comply as	par ladalla la		per requirement	

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per requirement	Physically check the all certificates.	years Comprehensive annual maintenance contact (CMC) after 5 years warranty period should be quoted by vendor
Should comply as	from vendor.	the data of similar and 5
	also take the undertaking	
	generator and software and	
	manufacturer on detector,	
	Physically check make of	<ul> <li>X-Ray generator, detector &amp; software should be from same manufacturer for</li> </ul>
100	documents	
	certificates in bid	The unit should be European CE from notified body should be provided.
	Physically check	user location.
	the bid documents	Firm should provide demonstration /training regarding the equipment at
	Performance certificates in	The company should have proven track record in Govt. sector.
	documents BO AND	
	certificates in bid	
	Physically check	The unit should be approved by AERB.
	documents	
per requirement	certificates in bid	OTHER REQUIREMENTS: The company should be ISO & ICMED certified.
05		California of the province of
		Suitable rating LIPS is provided for memory software
per requirement	and compliance statement.	A service voltage stabilizer of suitable rating for complete unit.
Should comply as	Confirm with the datasheet	Necessary hardware as well as software should be provided.
		provided.
per requirement	as physically	<ul> <li>Auto image stitching with provision of 4or more image stitching should be</li> </ul>
Should comply as	Check data sheet as well	IMAGE STITCHING:
2	physically	Suitable rating UPS for software system should be provided
	also check the UPS	line Regulation ± 10%.
per requirement	Check the data sheet and	<ul> <li>The unit should be operable on 400V AC, 50 HZ 3 Phase – Max. Allowable</li> </ul>
Should comply as		POWER REQUIREMENT:
DESIRED	OF OFFICERS	
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# 4. QRS/SPECIFICATIONS & TRIAL DIRECTIVES FOR 64 SLICE CT SCAN MACHINE/ CT-64 ANGIO DETECTOR

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	KV Range: 80-110 or more		mA Range: 20-300 mA (With incremental steps of 10mA).		Power output: 50 KW or higher	High Frequency type.	X-Ray Generator:	3-D laser lights for positioning.	FOV: 50 cms or more	Aperture: 70 cms or more and Gantry tilt: ±24 degree or more physical tilt.	Gantry:	The model quoted should be, AERB, Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: -	The system should be latest state of the art, independent 32 or more rows of detectors with acquisition of at least 64 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.	SPECIFICATION
monitor	Check Product datasheet and console	monitor console	Check Product	datasheet	Check Product	Check Product datasheet		Check Product datasheet / physically	Check Product datasheet and console monitor	Check Product datasheet / physically		Check desired certifications issued by respective authorities	Check Product datasheet and console monitor	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
-	Should comply as per requirement	requirement		requirement	Should comply as per	Should comply as per requirement		Should comply as per requirement	requirement requirement		2		Should comply as per requirement	RESULTED / EXPECTED / DESIRED

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	Bolus Triggered or bolus chase spiral acquisition should be available.	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.	Minimum slice thickness should be 0.625 mm or less.	Scan Time should be 0.5 sec or less for full 360-degree rotation.	Spiral Acquisition:	Floating table top with foot pedal/hand control for positioning	Metal free scan-able range of 150 cm or more.	Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less.	Patient Table:	Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube	Tube Voltage: 80-110 kV or more	X-Ray Tube:	SPECIFICATION
Char	Check Product datasheet / console monitor	Check Product datasheet / console monitor	Check Product datasheet and console monitor	Check Product datasheet and console monitor		Check Product datasheet and Patient Table physically	Check Product datasheet and Patient Table / console monitor	Check Product datasheet and Patient Table / console monitor		Check Product datasheet	Check Product datasheet and console monitor		PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
	Should comply as per e requirement	Should comply as requirement	Should comply as requirement	Should comply requirement		t Should comply as per	Should comply as requirement			requirement	Should comply as requirement		ST RESULTED  RD EXPECTED /  DESIRED

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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.		Operator Console:	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.	Image Reconstruction:	Solid state or rare earth detectors of latest technology free from repeated calibration.	At least 32 or more rows of independent detectors are required with Z-axis coverage of 20 mm or more.	Detector- Capable of acquiring 64 or more slices per 360 degree of rotation.	Data Acquisition System:	on - 5 mm or less at 3.0 HU using 20 cm CATPHAN ce thickness.	Image Resolution:  High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV.	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.	SPECIFICATION
Check Product datasneet and console monitor	Product console		Check Product datasheet and console monitor		Check Product datasheet	Check Product datasheet and console monitor	Check Product datasheet and console monitor		Check Product datasheet	Check Product datasheet	Check Product datasheet / console monitor	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
per requirement	1		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	EXPECTED / DESIRED

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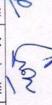
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NO.	SPECIFICATION	
	Raw Data & Image storage with at least 500 GB Hard disc. System should have	O
	image storing capacity of 5,00,000 or more in 512x512 format.	1
•	Auto-voice capability with custom designed key board and mouse.	
•	Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided.	
10	Workstation and Client Server architecture	
•	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	CONTRACT TO SERVICE STATE OF THE PARTY OF TH
	Hard disc storage capacity of 512 GB or more, with 19 inches or more night 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.	
	on should be independent of the console.	Check   Datasheet
	Two-way data transfer between the operator console & the satellite workstation should be automatic and standard.	Check Datasheet
•	Post Processing Soft-wares	
Θ	Perfusion CT for brain	quotation
(ii)	CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view.	Check WS quotation
(iii)	ity for virtual dissection and computer aided detection	
(iv)	Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction	quotation
3		Check WS quotation
(vi)	Dental CT.	Check WS quotation

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Check WS datasheet
Check product datasheet
Check VVS datasheet and technical quotation
Check product datasheet / console monitor
quotation Datasneet and
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Comprehensive Maintenance Contract for next five years including all the accessories. Air conditioning and CT Tube.	<b>Warranty:</b> 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.	A free comprehensive software update guarantee for entire life of scanner must be provided.	System must be PACS, HIS/RIS interface ready without any new hardware or software.	Dual Head Pressure Injector with 100 syringes of 200ml.	Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup.	Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations	Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos.	Light weight- ZERO LEAD Radiation protection apparels including Aprons -5	Standard Patient positioning accessories and restraining devices - 01 set.	Collapsible wheel chair with rubberized swivel wheels – 01 no.	System Configuration Accessories, spares and consumables:	DICOM 3.0 Compatible.	17"x14"	Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500) Films) of 14x17 inch size along with System.	SPECIFICATION
Check CMC offer submitted by bidder	Check terms and condition submitted by bidder	Check Undertaking submitted by bidder	Check Product datasheet and main console / technical offer	Check technical offer	Check technical offer	Check technical offer		Check technical offer	Check technical offer	Check technical offer		Check technical offer	Check technical offer	Check technical offer	FOR TRAIL FOR BOARD OF OFFICERS
Should comply as per requirement	-	-	7.00	Should comply as per requirement	Should comply as per requirement	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	EXPECTED / DESIRED

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Earthing up to Electrical panel.	1.5 Ton total no - 05	02 Ton total no - 02	Split AC Standard brand	Helicit up to or o a Caria y.	Trench up to LIDS & Cantry	Lead Equivalent viewing glass as mentioned in specs with lead framing entire	Lead lined doors as per AERB Safety Norms.	Interior, Tiling, Electrification International standards.	Layout plan preparation as per AERB.	Bidders are supposed to visit site before submission of tender.	CT Room as per AERB Safety Protection Interiors Works - CT scan machine should be provided on Turnkey basis	<b>AERB site approval:</b> Vendors will support Hospital authorities for getting AERB Site approval, Final responsibility will be of hospital authorities.	will not be considered.  Vendors are requested to see the site for installation of the CT.	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	SPECIFICATION
Submitted by the bidder		submitted by the bidder	Check Turn-key quote	ed by the bic	Check Turn-key quote	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Turn-key ed by the bide	check compliance statement and undertaking submitted by the bidder		Check compliance statement, quotation etc. submitted by the bidder	FOR TRAIL FOR BOARD OF OFFICERS
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13. Required furniture (Computer tables, revolving chairs, patient chair) in all the	12. System interfacing cabling.	11. Turnkey bidder must coordinate with OEM/ Installation engineer.	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.	SPECIFICATION
Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	red by the bidd Turn-key ted by the bidd	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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	5. QRS/SPECIFICATIONS &TRIAL DIRECTIVES OF DEXA BONE DENSITOMETER
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	Computer Console.	Internal continuous calibration	Motorized Table and Rotating C-arm	X-ray System Switched-pulse dual-energy (100 kVp/140 kVp or more)	High Frequency X-ray Generator	High-resolution multi-element detector array with gadolinium sulfoxylate		One Pass Acquisition Technique; Multi-Detector Array Scanning Method	Patient part localizer cross hair laser light	Fan-Beam Technology	Technical details:			SPECIFICATION
)		Check physically	machine Check data sheet	and data sheet Check physically on	Check data sheet	Check with data sheet	detector	Check one pass physically on table and Data sheet for	machine	Check with Data sheet	) )	OF OFFICERS	FOR TRAIL FOR BOARD	PROCEDURE SUGGEST
		>		2.0						per requirement	Should comply as	DESIRED	EXPECTED /	RESULIED

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S SPECIFICATION  Standard Computer Hardware:  Computer Workstation with Dual Core 3 GHz or better  Computer Workstation with Dual Core 3 GHz or better  Windows operating system  Windows operating system  Windows operating system  Ordine suitable UPS minimum 30 Minutes Battery Backup.  External Shielding  External Shielding  Not Pesision  External Shielding  Not operating System  Automatic PASS/FALL Quality Control  FastExpress BMD 10 Second or less Acquisition  Standard Configuration:  DXA Operating System  Automatic PASS/FALL Quality Control  FastExpress BMD 10 Second or less Acquisition  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  FastExpress BMD 10 Second or less  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar spine	Standard Computer Hardware: Computer Workstainon with Dual Core 3 GHz or better Vindows operating system 1 T8 or better hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 T8 x2 nos. 19 or more Widescreen LCD/TFT/LED Monitor Colour laser printer: Colour laser printer: Colour laser printer: Colour laser printer: 10 nother suitable UPS minimum 30 Minutes Battery Backup. External Shielding Not required BMD Precision 1 28" or less PAL Height Limit 227 kg or more Automatic PASSTAL Quality Control Automatic PASSTAL Quality Control FastExpress BMD 10 Second or less Acquisition Single Energy Scan Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine		ROCEDIRE SHGGEST	RESULTED
Standard Computer Hardware: Computer Workstation with Dua! 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/TFT/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 : 22" or less Patient Weight Limit : 227 kg or more . Standard Configuration: 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 Exposure Time and dose: Lumbar spine	Standard Computer Hardware: Computer Workstaiton 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 Windescreen LCD/TFT/LED Monitor Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding : A10% or better/ Table Height : 28° or less Patient Weight Limit : 227 kg or more. Standard Configuration: DXA Operating System Automatic PASS/FAIL Quality Control Fast/Express BMD 10 Second or less Acquisition Single Energy Sean Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine		OR TRAIL FOR BOARD	EXPECTED /
Standard Computer Hardware: 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 2 TB x 2 nos. 19" or more Widescreen LCD/TFT/LED Monitor Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding : Not required BMD Precision : 21.0% or better/ Table Height : 28" or less Patient Weight Limit : 227 kg or more . Standard Configuration: 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 Single Energy Scan Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine	Standard Computer Hardware:  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 Windescreen LCD/TFT/LED Monitor  Colour laser printer.  Not required  IBMD Precision : 28" or less  BMD Precision : 22" kg or more ,  Standard Configuration:  Patient Weight Limit : 227 kg or more ,  Standard Configuration:  Standard Configuration:  Standard Configuration:  Date Press BMD 10-Second or less Acquisition  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar spine		FOFFICERS	DESIRED
Computer Workstation with Dua! 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/TFT/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 .  Standard Configuration: 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  Exposure Time and dose: Lumbar spine	Computer Workstation with Dua! 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/TFT/LED Monitor  Colour laser printer.  Online suitable UPS minimum 30 Minutes Battery Backup.  External Shielding Not required  BMD Precision 14 0% or better?  Table Height 128" or less Patient Weight Limit 227 kg or more ,  Standard Configuration:  DXA Operating System  Automatic PASSIFAIL Quality Control  Fast/Express BMD 10 Second or less Acquisition  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar Spine	Standard Computer Hardware:		Should comply as
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/TFT/LED Monitor Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding Not required BMD Precision Set 10.0% or better? Table Height 28" or less Patient Weight Limit 22" or less Patient Weight Limit 227 kg or more.  Standard Configuration: DXA Operating System Automatic PASS/FAIL Quality Control FastExpress BMD 10.Second or less Acquisition Single Energy Scan Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine	Windows operating system  It B or befter hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 IfB x 2 nos.  It B or befter hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 IfB x 2 nos.  It B or befter hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 IfB x 2 nos.  It B or befter hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 IfB x 2 nos.  It B or befter hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 IfB x 2 nos.  External Shielding : 4.0% or befter/  DAA Departing System  It B be Height : 227 kg or more.  Standard Configuration: 227 kg or more.  Check physically on monitor.  Check physically on monitor.  Check physically on monitor.  Check data sheet as applicable check and time, confirm physically.  Check data sheet as applicable.  Check data sheet as applicable	Jual Core 3 GHz or better	neck physically on monitor	per requirement
1 TB or better hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2 TB x 2 nos. 19" or more Widescreen LCD/TFT/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 : Standard Configuration: 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  Exposure Time and dose: Lumbar spine	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/TFT/LED Monitor Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding Not required I BMD Precision 128° or less I BMD Precision 128° or better/ Table Height 228° or less Patient Weight Limit 227 kg or more Standard Configuration: DXA Operating System OXA 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  Exposure Time and dose: Lumbar spine		ata sheet as applicable	0
drive 2TB x 2 nos.  19" or more Widescreen LCD/TFT/LED Monitor Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding : Not required BMD Precision : 28" or better: Table Height : 28" or less Patient Weight Limit : 227 kg or more ; Standard Configuration: 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 Single Energy Scan Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine	drive 2TB x 2 nos.  13° or more Widescreen LCD/TFT/LED Monitor  Colour laser printer.  Online suitable UPS minimum 30 Minutes Battery Backup.  External Shielding : Not required  External Shielding : Not ress  Check data sheet as applicable  Check data sheet as appli	GB RAM or more, DVD RAM drive, exte		6
• 19" or more Widescreen LCD/TFT/LED Monitor Colour laser printer. • 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 ;  Standard Configuration: • 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 • Exposure Time and dose: • Lumbar spine	19° or more Widescreen LCD/TFT/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 BMD Precision : <2.27 kg or more : BMD Precision : 227 kg or more : Table Height : 227 kg or more : DAA Operating System Automatic PASSE/FAIL Quality Control Fast/Express BMD 10. Second or less Acquisition DAA Operating System Automatic PASSE/FAIL Quality Control Fast/Express BMD 10. Second or less Acquisition Single Energy Scan Display Capability Window/Level Control for Image Optimization Exposure Time and dose: Lumbar spine	drive 2TB x 2 nos.	2	-3
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 ; Standard Configuration: 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  Exposure Time and dose: Lumbar spine	Colour laser printer. Online suitable UPS minimum 30 Minutes Battery Backup. External Shielding : Not required  Patient Weight : 28" or less Patient Weight Limit : 227 kg or more : 227 kg or mo	19" or more Widescreen LCD/TFT/LED Monitor		
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External Shielding : Not required    BMD Precision : 28" or better/   Table Height : 227 kg or more     DXA Operating System     Automatic PASS/FAIL Quality Control     FastExpress BMD 10 Second or less Acquisition     Single Energy Scan Display Capability     Window/Level Control for Image Optimization     Exposure Time and dose:   10 sec / 0.04 mGy or less     Lumbar spine   10 sec / 0.04 mGy or less     Proximal Femur   15 sec / 0.025 mGy or less     IVA in High Definition   15 sec / 0.025 mGy or less     Auto Hip Position/Rescan Feature     Automatic Scan Comparison for Serial/ previous Exams     Reporting Software   10 Year Fracture Assessment     Dual Hip Report     Pediatric Analysis for Spine, Femur and Forearm     Pediatric Whole Body with Body Composition Assessment     Infant Scan     Small animal for research.	External Shielding : 1.0% or better?     HaMD Precision : 227 kg or more .      Bam Precision : 227 kg or more .      Standard Configuration: DXA Operating System .      Automatic PASSIFAIL Quality Control .      Fast/Express BMD 10. Second or less Acquisition .      Single Energy Scan Display Capability .      Window/Level Control for image Optimization .      Exposure Time and dose: .      Lumbar spine			
BMD Precision	BMD Precision  1 Table Height  28" or less  Patient Weight Limit  227 kg or more  Patient Weight Limit  227 kg or more  Check physically on monitor  Automatic PASS/FAIL Quality Control  Automatic PASS/FAIL Quality Control  Past/Express BMD 10. Second or less Acquisition  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar spine		2	Non
Table Height : 28" or less  Patient Weight Limit : 227 kg or more :  Standard Configuration:  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  Exposure Time and dose:  Lumbar spine	Table Height Patient Weight Limit : 227 kg or nore .  Patient Weight Limit : 227 kg or more .  Standard Configuration:  DXA Operating System Automatic PASS/FAIL Quality Control  Fast/Express BMD 10 Second or less Acquisition Single Energy Scan Display Capability WindowLevel Control for Image Optimization  Exposure Time and dose: Lumbar spine	-	,	1-2
Patient Weight Limit . : 227 kg or more . Standard Configuration:  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  Exposure Time and dose: Lumbar spine	standard Configuration:  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  Exposure Time and dose: Lumbar spine			3-
Standard Configuration:  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  Exposure Time and dose:  Lumbar spine	Standard Configuration:  DXA Operating System  Automatic PASS/FAIL Quality Control  Automatic PASS/FAIL Quality Control  Fast/Express BMD 10 Second or less Acquisition  Single Energy Scan Display Capability  Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar spine	, :	,	, 0
<ul> <li>DXA Operating System</li> <li>Automatic PASS/FAIL Quality Control</li> <li>Fast/Express BMD 10 Second or less Acquisition</li> <li>Single Energy Scan Display Capability</li> <li>Window/Level Control for Image Optimization</li> <li>Exposure Time and dose: <ul> <li>Lumbar spine</li></ul></li></ul>	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  Exposure Time and dose:     Lumbar spine	Standard Configuration:	74	Should comply as
<ul> <li>Automatic PASS/FAIL Quality Control</li> <li>Fast/Express BMD 10 Second or less Acquisition</li> <li>Single Energy Scan Display Capability</li> <li>Window/Level Control for Image Optimization</li> <li>Exposure Time and dose: <ul> <li>Lumbar spine</li></ul></li></ul>	Automatic PASS/FAIL Quality Control Fast/Express BMD 10 Second or less Acquisition Single Energy Scan Display Capability Window/Level Control for Image Optimization  Exposure Time and dose: Lumbar spine	em	heck physically on monitor	per requirement
Fast/Express BMD 10.Second or less Acquisition Single Energy Scan Display Capability Window/Level Control for Image Optimization  Exposure Time and dose: Lumbar spine	Fast/Express BMD 10.Second or less Acquisition     Single Energy Scan Display Capability     Window/Level Control for Image Optimization  Exposure Time and dose:     Lumbar spine		ata sheet as applicable	
<ul> <li>Single Energy Scan Display Capability</li> <li>Window/Level Control for Image Optimization</li> <li>Exposure Time and dose: <ul> <li>Lumbar spine</li></ul></li></ul>	Single Energy Scan Display Capability Window/Level Control for Image Optimization  Exposure Time and dose: Lumbar spine	<ul> <li>Fast/Express BMD 10 Second or less Acquisition</li> </ul>	٠	-
Exposure Time and dose:  Lumbar spine	Window/Level Control for Image Optimization  Exposure Time and dose:  Lumbar spine	Single Energy Scan Display Capability	_	
Exposure Time and dose:  Lumbar spine	Exposure Time and dose:  Lumbar spine	<ul> <li>Window/Level Control for Image Optimization</li> </ul>		
<ul> <li>Lumbar spine</li></ul>	Lumbar spine	Exposure Time and dose:	heck data sheet for dose	Should comply as
<ul> <li>Proximal Femur</li></ul>	<ul> <li>Proximal Femur</li></ul>	10 sec / 0.04 mGy or less	nd time, confirm physically	per requirement
<ul> <li>Single Energy femur 15 sec / 0.025 mGy or less</li> <li>IVA in High Definition 15 sec / 0.025 mGy or less</li> <li>Auto Hip Positioning</li> <li>Reposition/Rescan Feature</li> <li>Automatic Scan Comparison for Serial/ previous Exams</li> <li>Reporting Software</li> <li>10 Year Fracture Assessment</li> <li>Dual Hip Report</li> <li>Femur Fracture Assessment High Resolution Imaging Capability</li> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	<ul> <li>Single Energy femur 15 sec / 0.025 mGy or less</li> <li>IVA in High Definition 15 sec / 0.025 mGy or less</li> <li>Auto Hip Positioning</li> <li>Reposition/Rescan Feature</li> <li>Automatic Scan Comparison for Serial/ previous Exams</li> <li>Reporting Software</li> <li>10 Year Fracture Assessment</li> <li>Dual Hip Report</li> <li>Femur Fracture Assessment High Resolution Imaging Capability</li> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	i		
<ul> <li>IVA in High Definition 15 sec / 0.025 mGy or less</li> <li>Auto Hip Positioning</li> <li>Reposition/Rescan Feature</li> <li>Automatic Scan Comparison for Serial/ previous Exams Reporting Software</li> <li>10 Year Fracture Assessment</li> <li>Dual Hip Report</li> <li>Femur Fracture Assessment High Resolution Imaging Capability</li> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	NA in High Definition 15 sec / 0.025 mGy or less      Auto Hip Positioning     Reposition/Rescan Feature     Automatic Scan Comparison for Serial/ previous Exams     Reporting Software     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.	:	*	
<ul> <li>Auto Hip Positioning</li> <li>Reposition/Rescan Feature</li> <li>Automatic Scan Comparison for Serial/ previous Exams</li> <li>Reporting Software</li> <li>10 Year Fracture Assessment</li> <li>Dual Hip Report</li> <li>Femur Fracture Assessment High Resolution Imaging Capability</li> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	<ul> <li>Auto Hip Positioning</li> <li>Reposition/Rescan Feature</li> <li>Automatic Scan Comparison for Serial/ previous Exams</li> <li>Reporting Software</li> <li>10 Year Fracture Assessment</li> <li>Dual Hip Report</li> <li>Femur Fracture Assessment High Resolution Imaging Capability</li> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>			
an Feature Comparison for Serial/ previous Exams Assessment Assessment High Resolution Imaging Capability s for Spine, Femur and Forearm Body with Body Composition Assessment research.	Check data sheet and confirm physically sessment High Resolution Imaging Capability for Spine, Femur and Forearm Sody with Body Composition Assessment  Tresearch.	Auto Hip Positioning	heck data sheet and	Should comply as
Assessment Assessment High Resolution Imaging Capability of Spine, Femur and Forearm Body with Body Composition Assessment research.	Assessment Assessment Assessment High Resolution Imaging Capability s for Spine, Femur and Forearm Body with Body Composition Assessment research.		onfirm physically	per requirement
Assessment Assessment High Resolution Imaging Capability s for Spine, Femur and Forearm Body with Body Composition Assessment research.	Assessment Assessment High Resolution Imaging Capability Is for Spine, Femur and Forearm Body with Body Composition Assessment research.	<ul> <li>Automatic Scan Comparison for Serial/ previous Exams</li> </ul>		
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<ul> <li>Pediatric Analysis for Spine, Femur and Forearm</li> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	hole Body with Body Composition Assessment al for research.		ontirm physically	
<ul> <li>Pediatric Whole Body with Body Composition Assessment</li> <li>Infant Scan</li> <li>Small animal for research.</li> </ul>	hole Body with Body Composition Assessment al for research.	Pediatric Analysis for Spine, Femur and Forearm		
Infant Scan     Small animal for research.	al for research.	<ul> <li>Pediatric Whole Body with Body Composition Assessment</li> </ul>	-,-	
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	de de de	Small animal for research.		
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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	location.	- Firm should provide demonstration /training regarding the equipment at user	<ul> <li>The company should have proven track record in Govt. sector.</li> </ul>	- The company should have a local Service center.	<ul> <li>The unit should be European CE Certified from Notified body.</li> </ul>	- The unit should be approved by AERB.	- The company should be ISO, EN-ISO& ICMED certified.	STANDARD, SAFETY & TRAINING:	Inter Vertebral Assessment with High Resolution Imaging Capability	Visceral Fat Assessment	<ul> <li>Additional age, sex and ethnic matched reference data</li> </ul>	NHANES body composition reference data	Advanced Body Composition Analysis with Inner Core	Whole Body BMD	Forearm	Dual Hip Feature	Proximal Femur Analysis and Hip	Supine Lateral Spine with Baseline Compensation	AP Lumbar Spine Analysis, Scoliosis Analysis	Scan and Analysis Protocols:		SPECIFICATION
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Should comply as per requirement							bei redamenten	Should comply as											ber reduirement	Should comply as	DESIRED	EXPECTED /

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Member-IX | Member-X | Member-XI | Member-XII

## QRS/SPECIFICATIONS & TRAIL DIRECTIVES OF MAMMOGRAPHY MACHINE

SPECIFCATION  SUGGEST FOR TRAIL  SUGGEST FOR TRAIL  SUGGEST FOR TRAIL  SUGGEST FOR TRAIL  EXPECTED / FOR BOARD OF  OFFICERS  SUGGEST FOR TRAIL  EXPECTED / FOR BOARD OF  OFFICERS  SUGGEST FOR TRAIL  EXPECTED / FOR BOARD OF  OFFICERS  Check the data sheet each.  Naximum mA output should be 5KW or more in steps of increment of 1 KV each  Maximum mA output should be 20 to 39KV or more in steps of increment of 1 KV each  Maximum mA output should be 10 to 39KV or more in steps of increment of 1 KV  A Range should be 20 to 39KV or more in steps of increment of 1 KV  A Rotating Anode X-Ray Tube having dual focus should be provided.  Focal Spots should be 500 mAs or more.  A Rotating Anode X-Ray Tube having dual focus should be provided.  For Rotating Anode Comfirm on the machine  STANY TUBE  A Rotating Anode X-Ray Tube having dual focus should be provided.  For Rotating Anode Comply as and confirm on the machine  A Rotating Anode X-Ray Tube having dual focus should be provided.  For Rotation Assembly should be more than 120mA  Check the data sheet and confirm on the machine  For Rotation Assembly should be more in steps of increment of 1 KV  A Rotating Anode X-Ray Tube having dual focus should be provided.  For Rotation Assembly should be provided.  Check the data sheet and confirm on the machine  Check the data sheet and confirm on the machine  For requirement Arthur and confirm the make machine  For Rotation Assembly should be provided.  Check the data sheet and confirm on the machine  Check the data sheet and confirm on the machine  Check the data sheet and confirm on the machine  Check the data sheet and confirm on the machine  Check the data sheet and confirm the make machine  Check the data sheet and confirm on the machine  Check the data sheet and confirm the make machine  Check the data sheet and confirm on the machine  Check the data sheet and confirm the make machine  Check the data sheet and confirm on the machine  Check Physically on machine  Check Physically on machine  Check Physically on machine  Check P	ယ	2	_	NO.
RESULTED / DESIRED / DESIRED / DESIRED / DESIRED / DESIRED / Should comply as per requirement ake	<ul> <li>A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube &amp; Bucky Assembly should be provided.</li> <li>Vertical Movement (Motor operated).</li> <li>Motorized rotation: +90 degree to -90 degree or more.</li> <li>Source to image distance (SID) should be 600mm or more</li> <li>Switches for up/down movement of Gantry, placed conveniently on both sides of machine frame should be provided.</li> <li>Compression release: Automatic release of Compression if there is</li> </ul>	<ul> <li>X-RAY TUBE</li> <li>A Rotating Anode X-Ray Tube having dual focus should be provided.</li> <li>Focal Spots should be</li> <li>Small Focus = 0.1 or better</li> <li>Large Focus = 0.3 or better</li> <li>Target Material: - Molybdenum</li> <li>Anode Heat Storage Capacity should be min 300KHU or more</li> <li>Collimator: Light Beam collimator with bright light source &amp; Auto shut off facility of Light source should be provided</li> </ul>	<ul> <li>X-RAY GENERATOR</li> <li>High Frequency X-Ray Generator with 50KHz frequency should be provided.</li> <li>Power of generator should be 5KW or more</li> <li>Maximum mA output should be more than 120mA</li> <li>KV Range should be 20 to 39KV or more in steps of increment of 1 KV each.</li> <li>mAs Range should be from 1 mAs to 650 mAs or more.</li> </ul>	SPECIFCATION
S S	Check Physically on machine	Check the data sheet and confirm the make model of tube and take an undertaking from vendor Check physically on tube head	Check the data sheet Check the data sheet Check the data sheet and confirm on the machine Check the data sheet and confirm on the machine	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
	Should comply as per requirement	Should comply as per requirement		RESULTED / EXPECTED / DESIRED



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SPECIFCATION		<ul> <li>Paddles: Round Spot Paddle, Tilt-able compression paddle with size of</li> </ul>	24 x 30cm	<ul> <li>24 x 30cm Bucky with 24x32 cm Grid of 5:1, 31 lines/cm or more should</li> </ul>		calization & Radiation protection should be provided.		<ul> <li>Transparent Lead Glass Screen for Operator Protection should be</li> </ul>		FLAT PANEL DETECTOR (FPD):	A complete imaging solution with cutting edge of performance integrated with	The detector should be In-direct/direct conversion with A-Si (amorphous silicon)	_	4cm x 30cm or more.	Active Image matrix 2.8K x 3K or more	Image depth should be min 14bit or better	Pixel size should be 85um or less (Smaller pixel size is preferred)	Detector resolution should be min 6.0 lp/mm. or better	ACQUISITION SOFTWARE should have below features:  Standard features detail	<ul> <li>GUI based integrated panel for X-ray &amp; Image parameters control.</li> <li>Image acquisition, processing &amp; storage in DICOM 3.0 platform</li> </ul>	Operating Modes	<ul> <li>APR with manual override</li> <li>AEC dual shot exposure</li> </ul>
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	Check Physically on	machine	Check Physically on	machine/ take an	undertaking from the	vendor	Check data sheet for	grid ratio	Check physically			Check data sheet / take	an undertaking from	the vendor						Check data sheet Check data sheet	Check physically on	macnine
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Recommended (Not Recommended)

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A ANDER MUMINITY	<ul> <li>Reset tab to restore</li> </ul>	<ul> <li>Pre-set multiple image layouts</li> </ul>	<ul> <li>EXI value indication</li> </ul>	True Image 1:1	<ul> <li>Magnifying Glass</li> </ul>	<ul> <li>Image Invert / Negative Image</li> </ul>	<ul> <li>Dynamic Zoom with pan</li> </ul>	& contrast.	Window width (WW	<ul> <li>Image rotation Cloc</li> </ul>	<ul> <li>Image reversal-Left</li> </ul>	<ul> <li>KV &amp;mAs stored with image properties</li> </ul>	<ul> <li>Symphony tools for image processing.</li> </ul>	<ul> <li>Image preview time in less than 10sec</li> </ul>	Post processing features: -	<ul> <li>Lock/Unlock the stu</li> </ul>	images	<ul> <li>Total exam counts a</li> </ul>	<ul> <li>Refresh facility</li> </ul>	<ul> <li>Sort of patient data</li> </ul>	<ul> <li>New patient entry m</li> </ul>	<ul> <li>Separate login for n</li> </ul>	Pre- processing features: -	IMAGE PROCESSING	Views	• Editing/Save of Exp	Filter Mo/ Rh selection	Normal & Dense preast	APR for automatic 6	APR & AEC Mode selection switches	<ul> <li>KV &amp;mAS increase/ decrease switches</li> </ul>	X-ray generator control: -		9.	
量の	Reset tab to restore to the default parameters of image	ge layouts	EXI value indication to indicate over/ under exposure			tive Image	pan		Window width (WW) & Window level (WL) adjustment for brightness	Image rotation Clock wise & antic clock wise in 900 step or more	Image reversal-Left to Right & Top to Bottom	h image properties	image processing.	in less than 10sec		Lock/Unlock the study for protection & editing.		Total exam counts as per selected period for accepted & rejected		Sort of patient data based on day, date, week & Patient ID.	New patient entry manual, Synch with MWL & emergency	Separate login for manager & technician.		(90)	Come personal and a come open in a	ire parameters. Filter & Focal spot in A	on on	Bast Sast	APR for automatic exposure parameters selection as per Fatty,	election switches	decrease switches			SPECIFCATION	
The Automotion							machines	Check physically on the	tness	0	-		× .					ed	• ;				machines	Check physically on the	-	DR -			macnines	, See			FOR BOARD OF	SUGGEST FOR TRAIL	111111111111111111111111111111111111111
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	SPECIFCATION	<ul> <li>Text &amp; Annotation</li> <li>Additional of pre-defined text markers</li> <li>Addition of user defined text</li> </ul>	<ul> <li>Addition of user defined text</li> <li>Addition of Arrow</li> <li>To clear selected and All annotation from image</li> </ul>	Measurements Features     Length / Distance measurement     Angle measurement	Mean & median calculation  Print Facility	<ul> <li>Offered software is compatible to connect with normal printer &amp; with dry laser DICOM printer</li> </ul>	<ul> <li>Customizable user selectable multiple print layout</li> <li>Print status facility</li> </ul>	Mammography specific DICOM print layouts	<ul> <li>Connectivity &amp; storage Features</li> <li>Storage of Images on CD/DVD with inbuilt DICOM viewer software enables to view images on any PC.</li> </ul>	<ul> <li>DICOM 3.0 ready to connect with any DICOM 3.0 modality (like PACS, RIS/HIS/ Dry laser printer)</li> </ul>	<ul> <li>LAN connectivity to transfer the image to another system.</li> <li>On line review of Software.</li> </ul>	Compatible with BAR Code reader	Monitor: 1 No. 19" or more medical display monitor should be provided
	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	Check physically on the machines			Check physically on the machines			Check physically on the machines	Check physically / datasheet				Check physically/ take the undertaking from the vendor
The section of the	EXPECTED / DESIRED	Should comply as per requirement							Should comply as per requirement				Should comply as per requirement

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2	SPECIFCATION	PROCEDURE	RESIII TED
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		OFFICERS	
11	POWER SUPPLY REQUIREMENT	Confirm with data sheet	Should comply as
	Single Phase, 230 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent		per requirement
	eartning on the Wall Socket.		
12	Other Requirements:		Should comply as
	<ul> <li>The company should be ISO company with CE Certified products with</li> </ul>	Check all the	per requirement
	notified number.	certificates physically	
	<ul> <li>The unit should be approved by AERB.</li> </ul>		
	<ul> <li>The company should have a local Service center.</li> </ul>		
	<ul> <li>The company should have proven track record in Govt. sector.</li> </ul>	Check the list of	
	<ul> <li>Firm should provide demonstration /training regarding the equipment at</li> </ul>	service center	
	user location.	Check the performance	
13	Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years	Physically check the all	Should comply as
	CMC after 5 years warranty period should be quoted by vendor	certificates / take the	per requirement
		undertaking from the	
		vendor.	

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

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Recemmendation of ADUCINES	Member-II   Member-III   Member-IV   Member-VI   Member-VII   Member-VIII   Member-IX	from layout the de the by the	Helium Boll off rate: 0.03 liter/hour or less	Helium Capacity: 800 Liters ~ or more,	Magnet Cooling System:	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.	SPECIFICATION
	Member-X Member-X Member	Chu	Check data sheet	Check data sheet		Take undertaking from Should comply the vendor per requirement	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
	mber-XI Member-XII	To Co	Should comply per requirement	Should comply per requirement		Should comply per requirement	RESULTED / EXPECTED / DESIRED
			as	S	E	as	

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Recommended

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Should have lower eddy current	Active shielded (AS) whole-body gradient coil system	Inner Diameter/ Bore Opening range: 63cm- 70 cm	Magnet length: 155cm or less	Wide Bore Magnet:	The gradient should be actively shielded with each axis having independently a Slew rate of 125T/m/s or more and peak Amplitude of 33mT/m or more	Actively shielded gradient system in X, Y, Z planes	Gradient performance for each axis:	<ul> <li>(ii) Should be very good for Single voxel and CSI Spectroscopy.</li> <li>(iii) Should be very good for Single voxel and CSI Spectroscopy.</li> <li>(iv) Automatic shimming in phantom. Please quote the shim value at 10x10x10 mm3</li> </ul>	For best image quality & application flexibility, offered MRI system must have best in class homogeneity. Should have following features: (Bidders must mention the details of their model of MRI) (i)Best homogeneity possible should be given. Specify homogeneity in VRMS at 10cm, 20cm, 30cm and 40cm DSV, and at max. FOV achievable with the quoted scanner.	Homogeneity:	Magnet Parameter: Field Stability: <0.1ppm/h	SPECIFCATION
Check physically	Check physically	Check physically	Check physically		Check data sheet	Check physically			Take undertaking from the vendor		Check data sheet	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement			Should comply per requirement	Should comply per requirement	Should comply per requirement	RESULTED / EXPECTED / DESIRED

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SPECIFCATION	Water-cooled coil and amplifier/air	Gradients: Resolution Parameters:		FOV: 5 to 50cm	Resolution: Min. Slice Thickness 2D: 0.1mm, Min. Slice Thickness 3D: 0.05mm	RF system:	RF system must be fully digital & solid state with transmit power of at least 12kW or more	RF System must have necessary hardware to support Phased array coils	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.	Number of independent RF Receiver Channels: 16 or more	Acoustic Noise level: <90dB	Mention Number of RF Channels that MRI system is capable to support for signal processing at a time.  RF Coils:	Main body coil (1) -the main body coil must be integrated to the magnet system	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 Wills.
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	Check physically		Check data sheet	Check physically	Check physically		Check data sheet	Check physically	Check physically	Check data sheet	Check data sheet	Check compliance	Check physically	Check physically
RESULTED / EXPECTED / DESIRED	Should comply per requirement		Should comply per requirement	Should comply per requirement	Should comply per requirement		Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement
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	Range of vertical table movement 52-85 cm of better	Song of vorticel table movement 52 95 cm or better	Scan range should be minimum of <b>130 cm or more</b>	The patient table system must be mounted directly to the magnet/ Whole body imaging in both head first & foot first positioning.	Patient Table:	a maximum combination of 2 Coils)	Dedicated peripheral coil or whole-hody coil with coverage of atleast 60cm (with	Flexible Coil (I)-Large, medium and Small FOV		Dedicated shoulder coil 6 channel and above	Dedicated Knee coil 8 channel and above	Sultable Wrist coll (o channel and above)	with the writer paid (6 shows) and obout	Dedicated lower extremity/peripheral angio coil: 16 channel and above		Dedicated Foot/Ankle 8 channel and above	Breast coil 4 Channel.	2	Body Coil (1): - Capable of doing abdomen, pelvis& MRCP imaging. It must	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).	SPECIFCATION
	Clieck data sileet	Chack data sheet	Check data sheet		Check data sheet	Circus priyorcany	Check physically	Check physically		Check physically	Check physically	Clieck physically	Chock physically	Check physically		Check physically	Check physically		Check physically	Check physically	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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Regional Shimming to improve homogeneity after entering patient into the Gantry.	Radial Scan (e.g. BLACE/ Propeller/ RADAR/Multi Vane	Field Echo (FE)	Inversion Recovery (IR)	Spin Echo (Single, Double and Multi Echo)	The clinical Imaging package must provide a full range of protocols / Technique optimized for a wide range of clinical applications in all anatomical regions with the following & Imaging and post processing techniques:	Image reconstruction speed:  Matrix 256 x 256, 100% F.O.V: 9,000 recons/s or more (Higher is preferred)	Screen matrix: 1920 x 1200 or more	Screen size: Within 21" - 24"	High resolution flicker-free LCD Monitor	DVD Storage capacity: 20,000 images (256 x 256) or more	SPECIFCATION
Check physically	Check physically	Check physically	Check physically	Check physically		Check data sheet	Check physically	Check physically	Check physically	Check physically	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement		Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	Should comply per requirement	RESULTED / EXPECTED / DESIRED
	patient into the Check physically Should per requi	Check physically patient into the Check physically	Check physically  Check physically  patient into the Check physically	E/ Propeller/ RADAR/Multi Vane Check physically improve homogeneity after entering patient into the Check physically	Check physically Check physically Check physically Check physically Check physically Check physically	Check physically Check physically Check physically Check physically Check physically	Higher is preferred) of protocols / Technique anatomical regions with  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically	Check physically of protocols / Technique anatomical regions with  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically	Check physically  Check physically  Check data sheet  Check data sheet  Check data sheet  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically	Check physically  Check physically  Check physically  Check data sheet  Higher is preferred)  of protocols / Technique anatomical regions with  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically	Check physically  Check physically  Check physically  Check physically  Check data sheet  Higher is preferred)  of protocols / Technique anatomical regions with  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically  Check physically

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Ortho package – comprehensive protocols for joint and spine imaging.	Protocols for morphology and contiguous coverage of both breasts simultaneously.	<b>Body package</b> – for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, MR Urography. Must allow multi-breath-hold examinations as well as free breathing examinations.	Angio package – MR Angiography (Contrast & Non contrast) and Venography.	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	Perfusion Imaging	MIP and MPR	2D Evaluations and quantitative analysis functions	Multi-slice multi angle capability	Parallel Imaging (e.g. ASSET /iPAT/SENSE/SPEEDER/RAPID)	Water Excitation technique for fat suppression function	Fat Water Saturation	Gradient Motion Re phasing (flow compensation)	Angiography Imaging (PC/TOF)	OPECIFCATION
Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	Check physically	SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
Should comply as	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	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	EXPECTED / DESIRED

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DTI Tractography - Visualization of multiple white matter tracts based on diffusion tensor imaging data to support the pre-surgical planning and to allow
BOLD (Blood Oxygen Level Dependent) imaging – Examination of intrinsic susceptibility changes in different areas of the brain, induced by external stimulation (such as motor or visual).  Diffusion Tensor Imaging (DTI) – Acquisition of data sets with multi directional diffusion weighting to asses anisotropic diffusion properties of the brain.
Chemical Shift Imaging (CSI) to examine metabolic changes in the brain (e.g. in tumors and degenerative diseases).  Susceptibility Weighted Imaging – Visualization of local changes of the magnetic field due to tissue properties in general and due to the presence of deoxygenated blood or blood decomposition products.
sets.  Proton Spectroscopy to examine metabolic changes in the brain such as and degenerative disease.
3D VRT for colored volume rendered images.  Neuro Perfusion evaluation software for post processing of brain perfusion
Motion Correction Software – Motion insensitive Turbo Spin Echo sequence to improve image quality for uncooperative patients such as children or adult trauma patient in head, spine, ortho and abdomen.
Whole Spine – Automatic whole spine composing facility
Whole Body Imaging – whole body imaging with the TR coil which is embedded in the gantry.
Advanced application packages:
Pediatric package – special neuro and cardiac imaging protocols by weight.
SPECIFCATION

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Chiller (Dedicated of MR) with soit starter	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	Suitable true online UPS unit for 30 minutes power backup during scan.	MR compatible Non-magnetic IV stand.	MRI room oxygen deficiency level monitor	MRI compatible medicine trolley (02), wheel chair (02)	200 DVD and 10 pen drive (32 GB)	MR Compatible Oxygen cylinder - 4 nos.	Closed Circuit CCD Camera	Two metal detector doors to be installed at the entrance points.	Hand held metal detectors (04)	MRI compatible Fire Fighting System, Detectors with Fire Extinguishers.	One non-ferromagnetic height adjustable patient transfer trolley of reputed make.	One suitable, 160KVA, silent Diesel Generator with auto switch over and AMF	Dual Head MRI Compatible Pressure Injector with 200 sets of syringes.	tray dry laser printer of above 550dpi. Mention the make of the printer. To be supplied with 10 packets / 1250films of 14x17 size.	Color lacor printer (all in one Scan conveniet) To be supplied with three	One latest generation laptop for online reporting. (16GB Ram, 1TB hard	Accessories to be supplied:	Sound less MRI for all sequences is required, mention the technology name	
1	the vendor	Take undertaking from														the vendor	Take undertaking from		Check physically	SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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SPECIFCATION	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.	uld be posted exclusively at the	duration of the guarantee period to assist in system maintenance, troubleshooting and research	rs Qualifications:	Valid US-FDA/EU-CE/JIS certificate of the offered model must be submitted.	IEC 60601-1-1 and IEC 60601-2-33 certificates for the model must be submitted.	ISO certificate must be submitted.	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.	lectric Connection of suitable capacity will be provided by the	All turnkey work for MRI room like Floor Tiles, False ceiling, Painting, Chiller palant, Shielding for Gantry Room, air conditioning and provision of essential controlling to 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
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS					Check all the				Check previous purchase order	Take indeptaking from	the vendor along with financial implication, which should be	provided along with the cost of machine.		
EXPECTED / DESIRED					Should comply	⊑.			Should comply per requirement		per requirement			
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TECHNICAL SPECIFICATIONS  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 selection during exam and minimum 8 sub preset 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  PROCEDURE SUGGEST FOR TRAIL FOR BOARD  Check data sheet Check physically / data sheet Check physically  Check data sheet Check physically / Check data sheet  Check physically / Check data sheet  Check physically / Check data sheet  Check physically / Check data sheet  Check physically / Check data sheet  Check physically / Check data sheet  Check physically  Check physically / Check data sheet  Check physically / Check physically  Check physically / Check data sheet  Check physically / Check physi
PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS  Check data sheet Check data sheet Check physically / data sheet Check physically Check physically Check physically Check physically Check physically Check physically

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<ul> <li>The System should have pulse subtraction / Pulse Inversion Tissue Harmonic Imaging for Better Contrast and Less Side Lobe Artifact</li> </ul>	The System should have 3 active Transducer ports.	<ul> <li>The System should have Side/ Vertical Display of 2D Images should be possible to improve the Examination Efficiency for Superficial Tissue and MSK Applications.</li> </ul>	The system should have 256 gray scales	<ul> <li>The System should High Dynamic range of 180db or more. Higher Dynamic range will be Preferred.</li> </ul>	<ul> <li>The system should have single key image optimization for 2D and Doppler</li> </ul>	All Panel keys should customize according to user preferences	controls.	Command Screen enable direct access to all basic and advanced system	• The freely fully programmable, mode-sensitive more than 8" Color Touch	<ul> <li>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.</li> </ul>	
	Check physically	Check physically	Check physically	Check physically	Check data sheet	Check data sheet			Check physically	Check physically	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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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 No Need to Select Different System Should have Receiving End Frequency and Spatial Compound Imaging Technology for, Fetaining Clinical Artifact and Compound Imaging Technology for Fetaining Clinical Artifact and Compound Imaging with multiple Levels Selections  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 elastography function and software.  The system should have elastography function and software.  The system should have brower Doppler Imaging mode.	NO.		SPECIFCATION PI	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	GEST RESULTED EXPECTED / ERS DESIRED
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.			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.		Recommon of AD Recomm
			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		of recommens
			The System should have advanced Real time Spatial Compound Imaging with multiple Levels Selections		
The with appl The The Pw poss			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 The system The system Pw Sample possible.		•	The system should have advanced wide band color Doppler imaging mode with directional in formations without blooming / over painting for low flow applications	TO TO THE TOTAL	
The system The system Pw Sample possible.		•	The System should have Directional Power Doppler Imaging mode.		
The system Pw Sample possible.			The system should have elastography function and software.		
Pw Sample possible.		•	The system should have PW Doppler & HPRF mode for All Transducer's.		
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	<ul> <li>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.</li> </ul>	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.	<ul> <li>Measurements and Calculations:</li> <li>Measurement should be possible on frozen images and Images Recalled from</li> </ul>	the Image archive.	<ul> <li>The System should have Comprehensive set of Measurements in OB / Gyn Applications</li> </ul>	<ul> <li>Template customization should be possible.</li> </ul>	<ul> <li>EDD should Display all OB Measurements</li> </ul>	Average US EDD and LMP EDD should display during scanning.	<ul> <li>LMP GA should display on Monitor screen during scanning.</li> <li>IIIGR Graph should be available.</li> </ul>	On Board Report for all Packages – Report transfer to Print Page along with	DROBES	Following Probes should be supplied along with system:	<ul> <li>Convex probe with bandwidth of 1-6 MHz</li> </ul>	<ul> <li>Volume convex probe with bandwidth of 1-6 MHz</li> </ul>	<ul> <li>TV/TR probe with bandwidth of 4-10 MHz</li> </ul>	<ul> <li>Linear Probe with bandwidth of 5-14 MHz</li> </ul>	Phase array sector probe for neonatal application with band width of 4-9
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EXPECTED / DESIRED				Should comply as per	requirement							Should comply	as per	requirement				

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

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<ul> <li>Unit should be High frequency Digital Radiography system with rotating anode X-Ray tube. 3D ceiling suspended stand with Auto tracking &amp; 2 separate fixed detectors in table bucky and vertical bucky each</li> </ul>	<ul> <li>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.</li> </ul>	from same manufacturer for seamless connectivity and consistent image quality	<ul> <li>Unit should be completely integrated (integrated generator and Image   software from same</li> </ul>	oblique position to perform all skeleton body (upright and lying down)  To confirm the Generator, pradiographs.	<ul> <li>System should be capable of performing exposure in vertical, horizontal and</li> </ul>		SPECIFCATION
	undertaking from the manufacturer. Rest all check Physically	Data Sheet and Physically and also get the	software from same manufacturer Check the	To confirm the Generator, as per  Detector and Console requirement		OF OFFICERS	
				as per requirement	Should comply	DESIRED	RESULTED/

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<ul> <li>VERTICAL BUCKY STAND:</li> <li>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.</li> <li>VB stand should have provision to do chest radiography with and without grid.</li> </ul>	Manual Override of Longitudinal & Transverse direction movements with electromagnet locks  Tube head Rotation (along vertical axis): ±180°.  Tube assembly should have 3D auto tracking on its control for synchronization with the detector fitted inside the vertical bucky stand & table.	nted tube stand with 3-dimensional motorized movements of overing a huge area. novements in longitudinal, Vertical and transverse direction panel mounted on Tube collimator assembly. with actuator based/ telescopic noiseless swift motorized up/d	<ul> <li>X-RAY TUBE: A Dual focus Rotating anode X-ray tube.</li> <li>Focal spots of tube should be: Small focus: 0.6 or less, Large focus: 1.5 or less</li> <li>Large Anode Heat storage capacity of more than 150KHU.</li> <li>Collimator: Multileaf collimator with LED light source with high lux output.</li> </ul>	<ul> <li>HIGH FREQUENCY GENERATOR:</li> <li>Generator should be of latest technology with high frequency 40 KHz or more X-Ray generator. Power output of 50KW or more</li> <li>KV range should be 40 to 125KV in 1KV/step.</li> <li>mA output: more than 500mA. (500mA at 100KV)</li> <li>mAs range should be from 1mAs to 200mAs or more</li> </ul>	SPECIFCATION
Check physically on Stand.		Check physically.	Check the data sheet and make model of tube. Check physically collimator	Check the data sheet. Check Physically on console and take x-ray on same parameter	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
should comply as per requirement		Should comply as per requirement	Should comply as per requirement	Should comply as per requirement	RESULTED / EXPECTED / DESIRED

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OPERATING STATION/WORK STATION:  X-RAY/IMAGE CONTROL CONSOLE  Fully integrated system with following features:  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.	<ul> <li>FLAT PANEL DETECTOR: Specifications:</li> <li>The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator.</li> <li>Size of detector must be 43 cm x 43 cm or more</li> <li>Active Image matrix 3K x 3K or better</li> <li>Image depth should be 14bit or better</li> <li>Pixel size should be 150um or less (Smaller pixel size is preferred)</li> <li>Detector resolution should be more than 3.3 lp/mm</li> <li>DQE (Detector Quantum Efficiency) should be more than 65%.</li> </ul>	Mobile Diagnostic table should be provided.  Table should be of following dimensions: 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 180 Kg 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.
Check Physically on Console.	Check data sheet of the detector and check material.  Also take the undertaking from Vendor.	Check physically	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
Should comply as per requirement	Should comply as per requirement	Should comply as per requirement Re	RESULTED EXPECTED / DESIRED

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		<ul> <li>Preset image processing tools for different anatomy</li> <li>Image cropping</li> <li>Image mirror, rotate.</li> <li>Image annotation</li> <li>Add image accept/reject comments</li> <li>Separate log for Rejected, Accepted and Printed images.</li> <li>True size for printing.</li> <li>Hard disc capacity for image storage &gt;3000 images or more</li> <li>Inbuilt CD/DVD writer facility</li> </ul>	
		<ul> <li>MAIN FEATURES</li> <li>Digital image processing technology</li> <li>Preview image in less than 5 seconds.</li> <li>Exam Specific Algorithms image processing for consistent image quality of all body parts.</li> </ul>	
as per requirement	Check Physically on Console.	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:	
Should comply		<ul> <li>APR programs: More than 1000 programs. (Expandable as per users requirement).</li> <li>A dual action hand Switch with Retractable cord for Radiation Protection of Operator.</li> <li>IMAGE ACQUISITION SOFTWARE AND ITS CHARACTERISTICS</li> </ul>	ဖ
		gramming Radiography (i.e. APR): Preprogranuman Anatomy which helps the user to select explored on body part, examination view and size of the proputer-based system (full system integration) so any numming combinations is possible. User can define his rs and can edit the existing parameters to his satisfactions.	
GEST RESULTED / EXPECTED / ERS DESIRED	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	SPECIFCATION	NO.

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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	The company should have proven track record in Govt. sector.  Firm should provide demonstration /training regarding the equipment at user location.	STANDARD, SAFETY & TRAINING:  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.	ACESSORIES:  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.	POWER SUPPLY REQUIREMENT: Three Phase, 400 Volts AC 50Hz with line resist 0.2 Ohms. Line Regulation ±10%.	MONITOR: 1 No. 19" or more LCD/TFT/LED monitor should be provided.	Get DICOM work list     DICOM Print     DICOM Store     Support DICOM MPPS	SPECIFCATION
Physically check the all certificates.		Physically check the all certificates.	Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories	Check the data sheet	Check Physically the size of the monitor		PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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		EXPECTED / DESIRED

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	<ul> <li>(anatomical presets).</li> <li>It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement</li> </ul>	spective regions of slates without patie	d imaging plates word size 35 cm x 43 spective regions of plates without patie	an undertaking from 8 x vendor as applicable d imaging plates with >15 of size 35 cm x 43 cm. spective regions of the body slates without patient	arsion.  arsion.  n stack 4 or more cassettes and have 4 or more dard size cassettes and imaging plates from 8 x ography cassettes and imaging plates with >15  00 or more IPs/ hour of size 35 cm x 43 cm. than 50 sec.  ssing protocols for respective regions of the body ng exposed imaging plates without patient workflow requirement	<ul> <li>Mammography Cassettes of both size 02 cassettes of each size total 04 nos.</li> <li>Image reader (Multi Loader Image Reader).  The model quoted should be of latest version.  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  It should be able to process mammography cassettes and imaging plates with &gt;15 pixels/mm resolution  Processing capacity should be of 100 or more IPs/ hour of size 35 cm x 43 cm.</li> <li>It should have various image processing protocols for respective regions of the body (anatomical presets).</li> <li>It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement</li> </ul>	<ul> <li>24 cm x 30 cm=2 nos</li> <li>18 cm x 24 cm=2 nos</li> <li>Mammography Cassettes of both size 02 cassettes of each size total 04 nos.</li> <li>Image reader (Multi Loader Image Reader).</li> <li>The model quoted should be of latest version.</li> <li>Multi loader image reader which can stack 4 or more cassettes and have 4 or more input slots with following features: -</li> <li>It should be able to process all standard size cassettes and imaging plates from 8 x</li> <li>It should be able to process mammography cassettes and imaging plates with &gt;15 pixels/mm resolution</li> <li>Processing capacity should be of 100 or more IPs/ hour of size 35 cm x 43 cm.</li> <li>It should have various image processing protocols for respective regions of the body (anatomical presets).</li> <li>It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement</li> </ul>	<ul> <li>35 cm x 43 cm=2 nos</li> <li>35 cm x 35 cm=2 nos</li> <li>24 cm x 30 cm=2 nos</li> <li>18 cm x 24 cm=2 nos</li> <li>18 cm x 24 cm=2 nos</li> <li>Mammography Cassettes of both size 02 cassettes of each size total 04 nos.</li> </ul> Image reader (Multi Loader Image Reader). 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It should be able to process mammography cassettes and imaging plates with >15 pixels/mm resolution  Processing capacity should be less than 50 sec.  It should have various image processing protocols for respective regions of the body (anatomical presets).	Imaging plates (IPs) and cassette.  CR System compatible imaging plate of following sizes are required.  CR System compatible imaging plate of following sizes are required.  CR System compatible imaging plate of following sizes are required.  CR System compatible imaging plate of following sizes are required.  CR System compatible imaging plate of following sizes are required.  Check Physically and take the undertaking from vendor regarding per from vendor regarding per mumber of cassettes.  All thought to cassettes of both size 02 cassettes of each size total 04 nos.  Image reader (Multi Loader Image Reader).  The model quoted should be of latest version.  It should be able to process all standard size cassettes and imaging plates from 8 x or vendor as applicable and undertaking from an undertaking per requirement and imaging plates with >15  Processing capacity should be of 100 or more IPs/ hour of size 35 cm x 43 cm.  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 and comply as   Check Physically and take the undertaking plates (IPs) and cassette.   Check Physically and take the undertaking plate of comply as   CR System compatible imaging plate of following sizes are required.   Check Physically and take the undertaking from vendor regarding plate of comply as   CR System compatible imaging plate of following sizes are required.   Check Physically and take the undertaking from vendor regarding plate of comply as   CR System compatible imaging plate of following sizes are required.   Check Physically   Ab   CR   Check Physically   Cassettes   Check Physi	Patient/cassettes identification CR work station Laser Imager  Imaging plates (IPs) and cassette. CR System compatible imaging plate of following sizes are required. CR System compatible imaging plate of following sizes are required. CR System compatible imaging plate of following sizes are required. CR System compatible imaging plate of following sizes are required. CR System compatible imaging plate of following sizes are required. Check Physically and take the undertaking from vendor regarding number of cassettes.  Mammography Cassettes of both size 02 cassettes of each size total 04 nos.  Image reader (Multi Loader Image Reader). The model quoted should be of latest version. It should be able to process all standard size cassettes and have 4 or more in the should be able to process all standard size cassettes and imaging plates from 8 x vendor as applicable on the 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	Frequirement   Freq	digital radiography the computed assettes  Imaging plates and cassettes  Imaging plates and cassettes  Imaging plates and cassettes  Preview station/CR console  Patient/cassettes identification  CR System compatible imaging plate of following sizes are required.  CR System compatible imaging plate of following sizes are required.  Som x 43 cm=2 nos  Som x 43 cm=2 nos  Ramnography Cassettes of both size 02 cassettes of each size total 04 nos.  Image reader (Multi Loader Image Reader).  The model quoted should be of latest version.  Multi loader image reader which can stack 4 or more input slots with following features:  It should be able to process all standard size cassettes and imaging plates from 8 x  O 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.  It should have explability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement	Specification for the multi loading computed radiography system (CR System) should be made of:  Imaging plates and cassettes Imaging plates and cassettes Imaging plates and cassettes Preview station/CR console Preview station/CR cassettes Per requirement Preview station/CR	Specification for the multi loading computed radiography system-for high resolution digital radiography the computed radiography system (CR System) should be made of:  Imaging plates and cassettes:  Imaging plates and cassettes.  CR work station  Imaging plates (IPs) and cassette.  CR System compatible imaging plate of following sizes are required.  35 cm x 43 cm=2 nos  16 cm x 30 cm=2 nos  18 cm x 35 cm x 35 cm=2 nos  Multi loader image Reader).  The model quoted should be of latest version.  It should be able to process all standard size cassettes and imaging plates with >15 pixelsmm resolution  Processing capacity should be less than 50 sec.  It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement.

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	SPECIFCATION	Depth acquisition resolution should be 12 bits or more.	<ul> <li>Reading sampling resolution should be 5-20 pixel/mm or more for 14" x 1/:</li> <li>It should have ability to route the images to multiple destinations like work stations</li> </ul>	laser camera etc.	It should have storage capacity of at least 2000 images locally without recourse to a	of contingency plan.	Preview station/CR Console.  It should have preview station/console with 19 inch or more good resolution antiglare	flicker free 1FT/LCD color monitor having standard features software	<ul> <li>It should have customizable graphic user interface (GUI) touch screen.</li> </ul>	<ul> <li>It should have software which enables to see in the preview terminal the deviation from normal exposures should have indication of over exposure &amp; under exposure on</li> </ul>	<ul> <li>It should have the facility of auto-routing images to pre-defined DICOM destinations</li> </ul>	and also possible to direct print the images without going to CR Work Station.	<ul> <li>It should have preferably the facility of pan zooming rotation window level adjustment in the image edge enhancement noise reduction latitude reduction etc.</li> </ul>	Patient/cassettes identification.	<ul> <li>Should have bar code reader or another patient/cassettes identification system.</li> </ul>
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NO.	SPECIFCATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
6	DEDICATED ADVANCED WORK STATIONS OTHER THAN CONSOLE	Check the Physically /
5	Should have 19 inch or more antiglare flicker free medical grade TFT/LCD	take an undertaking as
	flat monitor with at least one mega pixel resolution of standard made like	applicable
	BARCO	
	<ul> <li>Should have 320 GB or more storage capacity (hard disk) with 4 GB or</li> </ul>	
	more RAM latest high-speed core 2 duo or any other processor of 3.0 GHz	
	or more speed and have CD & DVD burner	
	<ul> <li>Should have latest windows based original software</li> </ul>	
	<ul> <li>It should accept images from, CR reader without loss of any data.</li> </ul>	
8	<ul> <li>It should have built in routine for using predefined image processing</li> </ul>	
	parameters for image quality enhancement	
	<ul> <li>It should have mechanism for storing the patient image based on name</li> </ul>	
	data exam etc.	
	<ul> <li>It should have capability of storing user defined image processing</li> </ul>	
	parameters capability of overwriting predefined image parameter with user	
	defined parameters & storing these two images separately	
	<ul> <li>It should be able to process the raw image data of CR reader and have</li> </ul>	
	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.	
	<ul> <li>It should have provision for customized printing formats in different layouts</li> </ul>	
	<ul> <li>It should have auto routing incoming image to predefined DICOM store or</li> </ul>	
ALT PROPERTY	print destination	
	<ul> <li>It should have mechanism for printing multiple images in one film with</li> </ul>	
	possibility of slide and true size printing	
	<ul> <li>It should be able to connect with other DICOM system such as MR work</li> </ul>	
	station CT work station etc.	

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<ul> <li>SOFTWARE</li> <li>The system should include the following software application as standard</li> <li>Quality control software.</li> <li>Software masking of the collimation areas.</li> <li>Special attention should be placed on pediatric and mammography applications.</li> </ul>	<ul> <li>It should be capable of printing in different layouts formats on single films customized layouts &amp;formats should be independent of films sizes.</li> <li>Image memory should be 512 MB.</li> </ul>	modalities for high volume centralized USG, CT, MRI, CR, DR, C Arm printing applications	<ul> <li>It should have compatibility of networking &amp; connectivity there should be the provision of direct connectivity to any DICOM MODALITY &amp; on installation there should be excitable operated provision of connection to at least 6 DICOM</li> </ul>	It should have high speed DICOM print server.	<ul> <li>It should have automatic quality/density control system to maintain the quality</li> </ul>	It should have at least three film sizes on line.	<ul> <li>It should be able to support at least four standard films size.</li> </ul>	of chemicals	<ul> <li>Film loading system should be daylight film loading and there should be no use</li> </ul>	<ul> <li>Time required to first print should be less than 100 sec for 14 inch x 17 inch</li> </ul>	<ul> <li>Image resolution/Pixel size should be 100 microns or less</li> </ul>	<ul> <li>Pixel depth architecture/gray scale resolution should be 14 bits or more</li> </ul>	<ul> <li>Processing capacity should be 100 sheets per hour more of 14 inch x 17 inch</li> </ul>	<ul> <li>Printing resolution should be 500 DPI or more for all the films size.</li> </ul>	<ul> <li>A dry laser chemistry imager capable of printing images in high quality</li> </ul>	Dry Laser Imager		SPECIFCATION
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<ul> <li>Standards, Safety and Training</li> <li>Should be FDA or CE.</li> <li>Manufacturer should have ISO certification for quality standards</li> <li>Comprehensive training for technical staff and support services till familiarity</li> </ul>	Ine company should provide demonstration.      Approval will be based on satisfactory demonstration.	<ul> <li>The CR system should have software security features like user names &amp; password to relevant unauthorized option.</li> </ul>	to take care of power failure for at least 30 minutes backup of the whole system	<ul> <li>The CR System should have a separate online UPS compatible with the unit</li> </ul>	<ul> <li>Should have built in image processing software.</li> <li>The CR System should have compatibility of upgradeability of PACS.</li> </ul>	<ul> <li>Grid detection &amp; grid pattern removal software.</li> </ul>	viewing of structures with vastly different densities like DRC EVP or similar.	It should have provision of processing for expanded visualization for optimal	be applied to the image without interfering with the image	arrows and other markers and measurements tools should allow free text to	<ul> <li>Annotation software advanced annotation features like customizable text</li> </ul>	stations.	<ul> <li>Software for storing images on any DICOM (or Newer Versions) complaints</li> </ul>	and layouts (multiple images on film, true size printing etc.)	<ul> <li>Software for printing on any DICOM printer and to print user defined formats</li> </ul>		SPECIFCATION
and undertaking			for all software part	and take an undertaking	possible, otherwise	Check physically if										BOARD OF OFFICERS	FOR TRAIL FOR
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Aperture: 70 cms or more and Gantry tilt: ±24 degree or more physical tilt.	Gantry:	The model quoted should be, AERB Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: -	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.	Technical Specification for 128 Slice CT Scan Machine	QRs/SPECIFICATIONS & TRIAL DIRECTIVES FOR 128 SLICE CT SCAN MACHINE/CT ANGIO MACHINE	> 5 years annual Comprehensive Maintenance Charge (ACMC) service	on all supplied items	Warranty and CMC	Documentation  ➤ User/Technical/Maintenance Manuals to be supplied in English	SPECIFCATION
Check Product datasheet / physically		Check desired certifications issued by respective authorities	Check Product datasheet and console monitor	Procedure suggest for trial for Board of Officers	ANGIO MACHINE	Compliance/Undertaking need to take form vendor	Compliance/Undertaking need to take form vendor		Compliance/Undertaking need to take form vendor	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube	Tube Voltage: 80-110 kV or more	X-Ray Tube:	KV Range: 80-110 or more	mA Range: 20-300 mA (With incremental steps of 10mA).	Power output: 50 KW or higher	High Frequency type.	X-Ray Generator:	3-D laser lights for positioning.	FOV: 50 cms or more	SPECIFICATION
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	High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV.	Image Resolution:	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.	Bolus Triggered or bolus chase spiral acquisition should be available.	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.	Minimum slice thickness should be 0.625 mm or less.	Scan Time should be 0.5 sec or less for full 360-degree rotation.	Spiral Acquisition:	Floating table top with foot pedal/hand control for positioning	Metal free scan-able range of 150 cm or more.	Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less.	Patient Table:	SPECIFICATION
	Check Product datasheet		Check Product datasheet / console monitor	Check Product datasheet / console monitor	Check Product datasheet / console monitor	Check Product datasheet and console monitor	Check Product datasheet and console monitor		Check Product datasheet and Patient Table physically	Check Product datasheet and Patient Table / console monitor	Check Product datasheet and Patient Table / console monitor		PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
	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	Should comply as per requirement		EXPECTED DESIRED

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Raw D     image	<ul> <li>Should per volume me application satellite wo</li> </ul>	High re	9 Opera	High-s Recon	8 Image	Solid state calibration	At least coverage	Detector- rotation.	7 Data A	Low co	No. SPECI
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.	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.	High resolution medical grade LCD color monitors of 19 inch or more.	Operator Console:	High-speed real-time reconstruction with display matrix of 1024x1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.	Image Reconstruction:	state or rare earth detectors of latest technology free from repeated ation.	At least 64 or more rows of independent detectors are required with Z-axis coverage of 38 mm or more.	or- Capable of acquiring/ generating 128 or more slices per 360 degree of	Data Acquisition System:	Low contrast resolution – 5mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.	SPECIFICATION
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how hummy the of the of In	Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps.	CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view.	Perfusion CT for brain	Post Processing Soft-wares	Two way data transfer between the operator console & the satellite workstation should be automatic and standard.	Memory of the workstation should be independent of the console.	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.	Workstation and Client Server architecture	Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided.	Auto-voice capability with custom designed key board and mouse.	SPECIFICATION
Chu No	Check WS Datasheet and quotation	Check WS Datasheet and quotation	Check WS Datasheet and quotation	Check WS Datasheet	Check product / WS Datasheet	Check product / WS Datasheet	Check product / WS Datasheet and technical offer	The second secon	Check technical offer	Check Product datasheet and physically	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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as	console monitor	Distance & angle measurement, freely selectable, positioning of co- ordinate system, grid and image annotation.	1
requirement			
as	console monitor	Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.	3
requirement			
Should	Check product datasheet / console monitor	Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms,	Ξ
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as	console monitor	•	
Should comply	Check product datasheet /	Image Evaluation Tools:	6
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as	console monitor		
Should comply	Check product datasheet /	Interactive & Automatic Cine display should be available.	5.
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as	quotation		
Should	Check WS Datasheet and	Liver segmentation display software in different colours, volume try	(Viii)
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as	quotation	be quoted as optional.	
Should comply	Check WS Datasheet and	Lung nodule evaluation software. CAD for Lung nodule evaluation software should	(vii)
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Should comply	Check WS Datasheet and	Dental CT.	(vi)
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Should comply	Check WS Datasheet and	Automatic bone Removal facility.	3
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as	quotation	functional analysis and ECG gated reconstruction	
Should	Check WS Datasheet and	Cardiac application package should include Plaque analysis, Calcium Scoring,	<u>S</u>
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format Must have internal minimum storage capacity of 5,00,000images of 512x512 and data archiving should be available independently at both the workstations. proper functioning should be provided by the vendor. All post processing facility additional viewing station for Radiologist. The necessary connectivity etc. for One similar independent post processing stations (workstations, total no.1) with 01 Collapsible wheel chair with rubberized swivel wheels - 01 no System Configuration Accessories, spares and consumables: Workstation software / licenses must be from the same manufacturer DICOM 3.0 Compatible Support Multiple Film Sizes: one of which must be 17"x14 Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets Dry Laser Imager: Two closed circuit TV for patient monitoring. An integrated intercom and Automated Patient Instruction System (API) should be Patient communication system: (500) Films) of 14x17 inch size along with System Member-III Member-IV Member-V | Member-VI | Member-VII Mémber-VIII Member-IX | Member-X | Member-X Check product datasheet Check technical offer Check WS datasheet and Check product datasheet Check WS datasheet technical quotation Check technical offer and physically OF OFFICERS Check technical offer Check technical offer Check technical offer Men Should comply Should comply Should comply requirement Should DESIRED Should comply Should comply requirement Should comply requirement Should comply requirement requirement Should requirement requirement requirement requirement comply\_ comply per per per Kelemmend

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To live to the control of the contro	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	1 Comprehensive Maintenance Contract (CMC) for the next five years including all the accessories, Air conditioning and CT Tube.	<ul> <li>Warranty: 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.</li> </ul>	<ul> <li>A free comprehensive software update guarantee for entire life of scanner must be provided.</li> </ul>	<ul> <li>System must be PACS, HIS/RIS interface ready without any new hardware or software.</li> </ul>	<ul> <li>Dual Head Pressure Injector with 100 syringes of 200ml.</li> </ul>	<ul> <li>Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup.</li> </ul>	<ul> <li>Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations</li> </ul>	<ul> <li>Light weight- ZERO LEAD Radiation protection apparels including Aprons -5 Nos.</li> <li>Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos.</li> </ul>	Standard Patient positioning accessories and restraining devices - 01 set.	SPECIFICATION
	Check compliance statement, quotation etc. submitted by the bidder	Check CMC offer submitted by bidder	Check terms and condition submitted by bidder	Check Undertaking submitted by bidder	Check Product datasheet and main console / technical offer	Check technical offer	Check technical offer	Check technical offer	Check technical offer	Check technical offer	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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Member-III Member-IV Member-VI Member-VII Member-VIII	Ch & C: )	Exposure warning indication system.	Earthing up to Electrical panel.	Split AC Standard brand 02 Ton total no - 02 1.5 Ton total no - 05	Trench up to UPS & Gantry.	Lead Equivalent viewing glass as mentioned in specs with lead framing console room.	Lead lined doors as per AERB Safety Norms.	Interior, Tiling, Electrification International standards.	Layout plan preparation as per AERB.	Bidders are supposed to visit site before submission of tender.	CT Room as per AERB Safety Protection Interiors Works- CT scan machine should be provided on Turnkey basis	<b>AERB site approval:</b> Vendors will support Hospital authorities for getting Site approval, Final responsibility will be of hospital authorities.	SPECIFICATION
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Member-X   Member-X   Member-XI	11	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	Check compliance statement and undertaking submitted by the bidder	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS
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13. Required furniture (Computer tables, revolving chairs, patient chair) in all the rooms -	12. System interfacing cabling.	11. Turnkey bidder must coordinate with OEM/ Installation engineer.	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.	SPECIFICATION	
Check Turn-key quote Should comply submitted by the bidder as per requirement	Check Turn-key quote Should comply submitted by the bidder as per requirement	Check Turn-key quote submitted by the bidder	Check Turn-key quote submitted by the bidder	PROCEDURE SUGGEST RESULTED FOR TRAIL FOR BOARD EXPECTED DESIRED	
Should comply as per requirement	Should comply as per requirement	Should comply as per requirement	Should comply as per requirement	RESULTED EXPECTED / / DESIRED	Appelluix- ip/cv/

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

ramic x-ray unit, should be able halograms  ontrolled ge of 220+10%, 50 Hz and line to compensate mains voltage grammable grammable	Procedures suggested for trial for Board Of Officers  Board should check halograms halograms  Datasheet during ge of 220+10%, 50 Hz and line to compensate mains voltage  grammable grammable grammable and intuitive 10" or binger color.  Procedures suggested for trial for Board Of expected desired  Datasheet during requirement requirement demonstration.	1.6 The unit should have an interactive informative	1.5 The unit should be fully digital control and user programmable	current of 2-16A and should have corrector to compensate mains voltage	1.4 The unit should be compatible with the line voltage of 220+10%, 50 Hz and line	1.3 HF X-ray Generator should be a microprocessor controlled	1.2 It should be floor & wall mounted	to capture panoramic radiographs and various cephalograms	1.1 The OPG should be a state-of-the-art digital panoramic x-ray unit, should be able	1. Machine Specifications:	No.	SI. TENDER SPECIFICATIONS
	Procedures suggested for trial for Board Of Officers  Board should check physically / Technical Datasheet during demonstration.	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	d user programmable	corrector to compensate mains voltage	line voltage of 220+10%, 50 Hz and line	ocessor controlled		arious cephalograms	igital panoramic x-ray unit, should be able			

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

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	3.9 <b>Warranty &amp; CMC:</b> 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor
	3.8 Quality Assurance: Quality assurance tests for OPG as per AERB norms to be provided by the Vendor
	Vendor should have atleast 2 installations / order copy of reputed Government institutions.
	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.
and documents in this regard	Electrical safety for Panoramic X-Ray unit should conforms to standards for electrical safety IEC-60601/IS-13450
OEM / Vendor should submit an undertaking	3.4 Installation and regular service and maintenance in every 6 months must be carried out company trained / certified engineers.
	3.3 Manufacturer / Supplier should have ISO certification for quality standards.
	3.2 It should have AERB approval certification prior installation
	Should be certified product by reputed standards agency european CE / US FDA
Board	Standard, Safety and Training:
	2.8 All accessories should be from reputed manufacturer
	Make and model of all the quoted accessories should be specified
	2.6 Thyroid shields – 2 nos. (lead free)
	2.5 Apron hanger suitable for the supplied aprons, shields (lead free) – 2 nos.

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

SPECIFICATION
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

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ACCQUISTION SOFTWARE: Integrated panel for control of Exposure parameters as well as image parameters.  OPERATING MODES:  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 limate quality.	<ul> <li>Target Material: Tungsten, Rhenium and Molybdenum</li> <li>Inherent Filtration should be more than 0.50mm Be</li> <li>Anode Heat Storage Capacity should be more than 200KHU.</li> <li>Added Filtration: Rhodium and Aluminium</li> <li>Collimator: Light Beam Collimator for 24cmx30cm field size with Auto shut off timer. Cone for Radiation Protection.</li> </ul>	X-RAY TUBE - Biangular, Rotating Anode X-Ray Tube having dual focus should be provided Focal Spots should be Small Focus = 0.1 Large Focus = 0.3	<ul> <li>High FrequencyX-Ray Generator with 50KHz frequency should be provided.</li> <li>Power of generator should be more than 4KW.</li> <li>Maximum mA output should be more than 140mA</li> <li>KV Range should be 20 to 40KV in steps of increment of 1 KV each.</li> <li>mAs Range should be from 1 mAs to 650 mAs or more.</li> <li>1 No. High Voltage Cable should be provided.</li> </ul>
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DE  OF OFFICERS  DE  of tomo, High definition of for tomo images with 1 degree each exposure & for tomo images with 1 degree each exposure & pnitor screen:  on)	SI. SPECIFICATION No.	3D TOMOSYNTHESIS MODE Three scan modes i.e. Standard t for tomo images     +/-15 degree scan angle for 2degree each exposure     +/-7.5 degree scan angle for	· < \$ 2	<ul> <li>mAs</li> <li>Interlocks indicating the fault in the machine</li> <li>Filter selected</li> <li>Focal sole selected</li> </ul>	<ul> <li>Compression force (In Newton)</li> <li>Compressed Breast Thickness (in cm)</li> </ul>	<ul> <li>Gantry angulations (in degree)</li> </ul>	<ul> <li>Gantry angulations (in degree)</li> <li>Generator controls in Acquisition system software:</li> <li>Exposure mode (Manual / AEC / Tomo) selection switch</li> <li>KV selection</li> </ul>	<ul> <li>Gantry angulations (in degree)</li> <li>Generator controls in Acquisition s</li> <li>Exposure mode (Manual / AEC / T</li> <li>KV selection</li> <li>mAs selection</li> <li>Large / Small Focal spot selection</li> <li>Filter selection</li> </ul>	Generator controls in Acquisitio Exposure mode (Manual / AEC KV selection mAs selection Large / Small Focal spot select Filter selection Switches on the Gantry: Compression up - down switch Gantry up - down switch
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Emergency OFF switch  Compression release switch  LBD ON / OFF switch  Exposure switch  Compression release switch  Exposure switch  COMPRESSION  INEGRATE SPECIFICATIONS  Integrated panel for control of Exposure parameters as well as image parameters  Standard Features Detail:  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.  X-Ray Generator Control:  KV &mAS increased decrease 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  Pre-Processing Features:  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.
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Post Processing Features (for 2D image):  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.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image mirror & Flip, Image rotation in steps & in 90 degree steps.  Image measurement  Image Print:  User defined print settings.  Selection of different film sizes  Tagged mage Features  Tagg	No.	SPECIFICATION	SUGGES OR BOAR	RESULTED EXPECTED DESIRED
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Recommended / Not Recommended UT			•	

No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	ST RESULTED RD EXPECTED /
	<ul> <li>Storage of 3D Loops on CD/DVD</li> <li>DICOM 3.0 ready to connect with any DICOM 3.0 modality (like PACS, RIS/HIS/ Dry laser printer)</li> </ul>		
	ii) HARDWARE SPECIFICATIONS Operating System: Windows 7 Pro 64 Bit or higher Hardware Characteristics • 24 GB RAM		
	<ul> <li>Processor i7 / latest</li> <li>1 TB HDD (or higher specifications)</li> </ul>		
	Nos. compatible wired keyboard		
	• Ethernet 10/100/1000 MBPS		
	• 4×USB 3.0		
	<ul> <li>Display/Screen/Monitor: 19" Medical Display Monitor 1 MP (Resolution: 1280 x 1024).</li> </ul>		
6	ADDITIONAL REPORTING WORKSTATION:		
	1no. 19" monitor for work list & 21" Medical display grey scale Dual Head 5MP monitors compatible for 3D Images views.	Check physically/data sheet	Should comply as per
7	STAND ASSEMBLY		icquiciliciii
	<ul> <li>-A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube &amp; Bucky Assembly should be provided.</li> <li>- Vertical Movement (Motor operated) should be 800mm or more.</li> </ul>	Check physically/data sheet	Should comply as per requirement
	<ul> <li>Motorized rotation: +180 degree to -180 degree or more</li> <li>Source to image distance (SID) should be 650mm or more</li> <li>Magnification Factor: 1.8x</li> </ul>		
	- Protection Barrier: Free standing fully transparent lead glass for operator protection		
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Member-I Me	-III   Member-IV   Member-VI   Member-VII   Member-IX    Connentation of ADG/mel	Member-X   Member-XI	Member-XII
	- Trans		

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PROCEDURE SUGGEST	RESULTED
FOR TRAIL FOR BOARD EYDECTED	EXPECTED

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No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED / EXPECTED / DESIRED
00	COMPRESSION:		
	Compression Paddle should be designed to minimize Patient pain and discomfort perception.  Movement:  Motor driven compression  Manual compression	Check physically/data sheet	Should comply as per requirement
	Compression Force: 20 ± 2 Kg or 196.2 ± 19.6 Newton Compression Speed: Dual speed compression Compression Movement: 180 ± 10 mm Automatic Decompression: Automatic decompression after exposure is provided to minimize Patient time under compression.		
	Digital Display     Digital display of compression force     Digital display of Compression Breast Thickness (CBT)		
	Compression Paddle Type  • 24 x 30 cm  • 18 x 24 cm  • Spot compression paddle 12x18 cm		
9	FLAT PANEL DETECTOR (FPD):		
	cutting edge of performance integrated with our EL DETECTOR:  EL DETECTOR:  LATOR: Cesium lodide (CsI).  (a-si)  n Software should be provided.	Check physically/data sheet. Take undertaking from the vendor as applicable.	Should comply as per requirement

Member-I

Member-II

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Member-III | Member-IV | Member-VI | Member-VII | Member-VIII | Member-V

Member-IX

Member X Member X

Member-XII

Recommended

Not Recommended

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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.  In the company should have a local Service center. The company should have proven track record in Govt. sector. The company should have proven track record in Govt. sector. The company should have proven track record in Govt. sector. The company should have proven track record in Govt. sector. The company should have proven track record in Govt. sector. The unit should have proven track record in Govt. sector. The company should have proven track record in Govt. sector. The company should have a local Service center. The company should have a local Service senter. The company should have proven track record in Govt. sector. The unit should have proven track record in Govt. sector. The unit should have proven track record in Govt. sector. The unit should have proven track record. The unit should have proven track record. The unit should have proven tr	S - 9 - 17	REQUIREMENT  0 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent  S should be provided for the backup of software & Co		
The unit should be approved by AERB. 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.  F (Dr. Rohl Shyam Bobil) CMC(SG) (ENT) RH, ITBP, Gr. Noida Member-II  (Dr. Rajkanal Nymesh) Comdt (Spl. Grl. (Surgery), ITBP, Member-IX)  (Dr. Shajan-Gupla) Condt (Spl. Grl. (Surgery), ITBP, Member-IX)  (Dr. Rajkanal Nymesh) Comdt (Spl. Grl. (Surgery), ITBP, Member-IX)  (Dr. Needschieb), ITBP (Dr. Noida Member-III  (Dr. Calif Dev) (Medicine), ITBP (Member-III  (Dr. Rajkanal Nymesh), RH, ITBP, Member-IX  (Dr. Needschieb), ITBP (Dr. Noida Member-III  (Dr. Rajkanal Nymesh), RH, ITBP, Member-IX  (Dr. Needschieb), ITBP (Dr. Needschieb), ITBP (Dr. Needschieb), ITBP (Dr. Noida Member-III  (Dr. Needschieb), ITBP (Dr. Needschieb) (Dr. Needsc	10.5	REQUIREMENTS: The company should be ISO & ICMED certified with European C		
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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.  anny & CMC: 5 years warranty from the date of supply of unit and 5 years period should be quoted by vendor  CMC: 5 years warranty period should be quoted by vendor  CMC: 5 years warranty period should be quoted by vendor  CMC: 5 years warranty period should be quoted by vendor  CMC: 6 yea		The company should be approved by AERB.		
A-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.  anny & CMC: 5 years warranty from the date of supply of unit and 5 years Physically check the all after 5 years warranty period should be quoted by vendor  (Dr. Rohit Shyam Bobil)  CMO(SG) (ENT)  Radiology) CRPF,  CMO(SG) (Paediatrics)  CMO(SG) (Paediatrics)  CMO(SG) (Paediatrics)  CMO(SG) (Paediatrics)  CMO(SG) (Paediatrics)  CMO(SG) (Paediatrics)  CMO(SG) (Denta)  (Dr. Chandrima Kan)  CMO(SG) (Paediatrics)  CMO(SG) (Denta)  (Dr. Chandrima Kan)  CMO(SG) (Pediatrics)  CMO(SG) (Pediatrics)		The company should have proven track record in Govt. sector.		
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