














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

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

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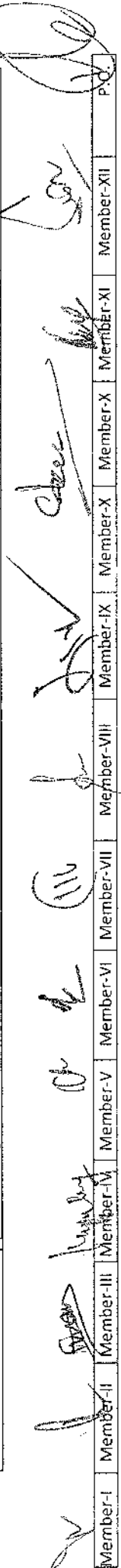
Appendix-1B(ii)

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

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1. COMPARATIVE STATEMENT OF "100 mA X-RAY MACHINE"

OLD QRS	PROPOSED QRS	JUSTIFICATION
<p>No. P-24C11/EC-VII/1/TD-QRS/ MoD-II/2015/ MHA/PROV-1 dtd 20/10/2016</p>	<p>High frequency Mobile Digital Radiography machine with a touch screen & a portable WI-FI flat panel detector of size 35 cm X 43 cm or more</p> <ul style="list-style-type: none"> It is a light weight machine which allows the user easy maneuverability in congested areas of wards, ICU's or hospital/clinic. Its ergonomic articulated spring balanced or articulated tube -stand allows the operator to position the tube for acquiring the images of desired views. The X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality. Touch screen tablet for instant review of image. Compact and light weight. <p>GENERATOR & TUBE X-Ray Generator Type: High frequency microprocessor controlled Power Output: 4.2 KW or more Generator Frequency: 110Khz or better KV Range: 40 to 120 KV or more in 1 KV/step. Maximum mA: 100 mA or more mAs Range: 1-200 mAs</p> <p>Dual action hand switch & IR remote for ready & Exposure should be provided.</p> <p>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</p> <p>Anode type Stationary/ tablet Anode Focal Spot 1.8mm or less Heat Storage Capacity 42KHU or more</p> <p>Conversion screen/ Scintillator: Cesium Iodide (CsI)</p> <p>Photodiode: amorphous silicon (a-Si)</p> <p>Size: 43 cm x 35 cm or more</p> <p>Active Image Matrix: 2.8 K x 2.3 K or better</p> <p>Limiting resolution: 3.33 lp/ mm or better</p>	<p>Digital version is now readily available in market which is technologically better than the conventional one.</p>



JUSTIFICATION

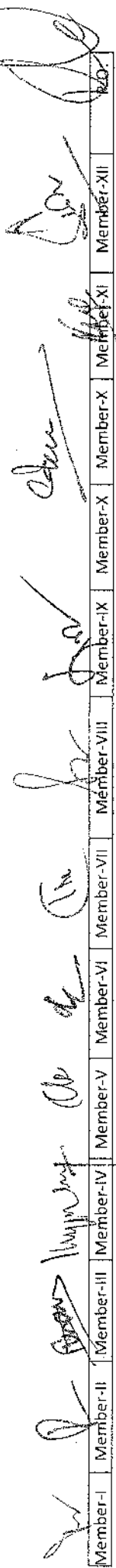
OLD QRS	PROPOSED QRS
	<p>Pixel pitch: 150 µm or better</p> <p>Weight of the detector: Less than 4 kgs or less</p> <p>Detector holder: Yes</p> <p>Image storage: in FPD: up to 100 Images or more</p> <p>IMAGING SOFTWARE</p> <p>Main features</p> <ul style="list-style-type: none"> • Patient Entry(Manual Emergency and MWL) • Patient Search Based On PID,NAME,DATE • Exam window • Process window • View Window • Print Window <p>Post processing features: -</p> <ul style="list-style-type: none"> • WW/MWL • Rotate • Zoom • Flip • Invert • Annotations • Measurements <p>DICOM Compatible features: -</p> <ul style="list-style-type: none"> • DICOM MWL • DICOM print • DICOM Send <p>TUBE STAND:</p> <p>Spring balanced stand / articulated is a mobile stand designed keeping in view the stringent requirements of mobility, light in weight & easy maneuverability and ease of operation. This mobile stand should be made to withstand all jerks while in use offering unparallel reliability. Tube stand should be easily moved on floor and lock should be provided to lock the movement on floor with following details</p> <ul style="list-style-type: none"> • Tube Head rotation of +/-90° along horizontal axis & +90° to -30° or better along tube axis • Weight of the machine should be 150 kgs or less • Min height should be 150 cm or less

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Power Supply:</p> <ul style="list-style-type: none"> • 1-Phase 230V (AC-supply) 50/60 Hz, ±10% with automatic compensation • 15 Ampere wall socket <p>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.</p> <p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	

2. COMPARATIVE STATEMENT OF "300 mA X-RAY MACHINE"

<p>No. P-24011/ EC-VII/1/ TD- QRs/MoD-II/ 2015/ MHA/ PROV-1 dtd 20/10/2016 & No.27012/ ADG(Med) 33(E)/ DA-3/TD/ 2020/1890 dated 25.11.2020.</p>	<p>Unit should be specifically designed for all aspects of general X-Ray imaging and operating at a High Frequency of 50 KHz for highly efficient X-ray production and preeminent Image Quality. The integrated Design of the machine allows the operator to acquire X-ray Images very conveniently. X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality.</p> <p>HIGH FREQUENCY GENERATOR:</p> <ul style="list-style-type: none"> • Generator should be of latest technology with high frequency 50 KHz X-Ray generator • Constant Power output of 30 KW or more • 300mA at 100 KV • KV range should be 40 to 125 KV or more in 1 KV/step • mA output: 300 mA or more • mAs range should be 1 to 200 mAs or more <p>X-RAY TUBE</p> <ul style="list-style-type: none"> • A Dual focus Rotating anode X-ray tube should be provided. • Focal spot size of 1.0mm (small focus) x 2.00 mm (large focus) or less • Anode heat storage capacity should be 140 kHU or more • Multi leaf Collimator having halogen lamp / bright light source and auto shut provision of the light. 	<p>Digital version is now readily available in market which is technologically better than the conventional one.</p>
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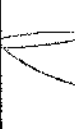
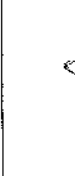
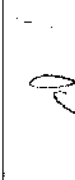
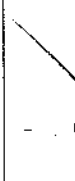
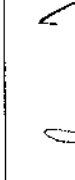



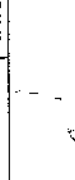

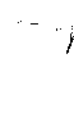
OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>FULL DICOM 3 COMPATIBILITY</p> <ul style="list-style-type: none"> • Get DICOM work list • DICOM Print • DICOM Store • Support DICOM MPPS <p>MONITOR: 1 No. 19" or more LCD/TFT/LED monitor should be provided.</p> <p>POWER SUPPLY REQUIREMENT: Three Phase, 400 Volts AC 50Hz with line resist 0.2 Ohms. Line Regulation $\pm 10\%$.</p> <p>ACCESSORIES:</p> <ol style="list-style-type: none"> 1. Servo Voltage Stabilizer of Suitable rating 1 NOS. 2. Tray Dry laser Chemistry Printer 1 NOS. 3. Lead Aprons - 02 Nos. 4. LEAD PROTECTION SCREEN 1 NOS. <p>STANDARD, SAFETY & TRAINING:</p> <ul style="list-style-type: none"> - The company should be ISO, EN-ISO & ICMED certified. - The unit should be approved by AERB. - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. <p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	

3. COMPARATIVE STATEMENT OF "1000 mA DIGITAL X-RAY MACHINE"

<p>No. P-24011/ EC-VIII/1TD- QRs/MoD-II/ 2015/MHA/PRO V-1 dtd 20/10/2016</p>	<p>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.</p> <p>The model quoted should be, AERB Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: -</p>	<p>CT machine having 64 detector rows is able to take 128 slices per 360° rotation. Hence to be labelled as 128 slice CT machine whose QR's are</p>
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

OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Gantry: Aperture: 70 cms or more and Gantry tilt: ±24 degree or more physical tilt. FOV: 50 cms or more 3-D laser lights for positioning.</p> <p>X-Ray Generator: High Frequency type. Power output: 50 KW or higher mA Range: 20-300 mA (With incremental steps of 10mA). KV Range: 80-110 or more</p> <p>X-Ray Tube: Tube Voltage: 80-110 kV or more Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube</p> <p>Patient Table: Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less. Metal free scan-able range of 150 cm or more. Floating table top with foot pedal/hand control for positioning</p> <p>Spiral Acquisition: Scan Time should be 0.5 sec or less for full 360-degree rotation. Minimum slice thickness should be 0.625 mm or less. Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.56 to 1.5 or more. Specify all possible pitch selections. Bolus Triggered or bolus chase spiral acquisition should be available. Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual.</p> <p>Image Resolution:- High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV. Low contrast resolution – 5 mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.</p>	<p>separately attached. 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</p>

												
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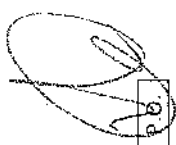
OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>Data Acquisition System: Detector- Capable of acquiring 64 or more slices per 360 degree of rotation. At least 32 or more rows of independent detectors are required with Z-axis coverage of 20 mm or more. Solid state or rare earth detectors of latest technology free from repeated calibration.</p> <p>Image Reconstruction: High-speed real-time reconstruction with display matrix of 1024 x 1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.</p> <p>Operator Console; High resolution medical grade LCD color monitors of 19 inch or more. Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation. Raw Data & Image storage with at least 500 GB Hard disc. System should have image storing capacity of 5,00,000 or more in 512x512 format. Auto-voice capability with custom designed key board and mouse. Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided.</p> <p>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 Hard disc storage capacity of 512 GB or more, with 19 inches or more high resolution medical grade colour LCD monitors capable of simultaneously viewing and performing all post processing functions and filming independently without the help of main console. Memory of the workstation should be independent of the console. Two-way data transfer between the operator console & the satellite workstation should be automatic and standard. Post Processing Soft-wares Perfusion CT for brain CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view.</p>	

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps. Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction Automatic bone Removal facility. Dental CT. Lung nodule evaluation software. CAD for Lung nodule evaluation software should be quoted as optional. Liver segmentation display software in different colours, volume try Interactive & Automatic Cine display should be available. Image Evaluation Tools: Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms, Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms. Distance & angle measurement, freely selectable, positioning of co- ordinate system, grid and image annotation. One similar independent post processing station (workstation, total no.1) with 01 additional viewing station for Radiologist. The necessary connectivity etc. for proper functioning should be provided by the vendor. All post processing facility and data archiving should be available independently at both the workstations.</p> <p>Must have internal minimum storage capacity of 5,00,000 images of 512x512 format. Workstation software / licenses must be from the same manufacturer.</p> <p>Patient communication system:</p> <p>An integrated intercom and Automated Patient Instruction System (API) should be provided. Two closed circuit TV for patient monitoring.</p> <p>Dry Laser Imager: Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500) Films) of 14x17 inch size along with System. Support Multiple Film Sizes: one of which must be 17"x14" DICOM 3.0 Compatible.</p>	

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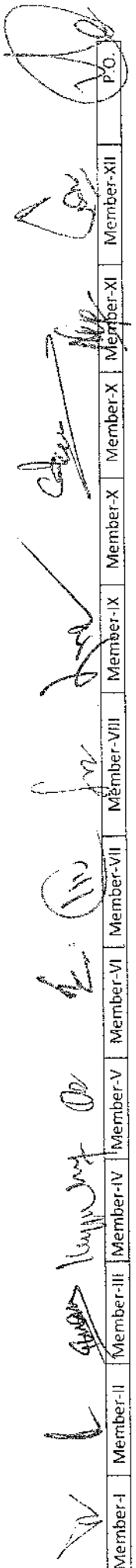
OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>System Configuration Accessories, spares and consumables: Collapsible wheel chair with rubberized swivel wheels – 01 no. Standard Patient positioning accessories and restraining devices - 01 set. Light weight- ZERO LEAD Radiation protection aprons including Aprons -5 Nos. Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos. Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup. Dual Head Pressure injector with 100 syringes of 200ml. System must be PACS, HIS/RIS interface ready without any new hardware or software. A free comprehensive software update guarantee for entire life of scanner must be provided.</p> <p>Warranty: 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.</p> <p>Comprehensive Maintenance Contract for next five years including all the accessories, Air conditioning and CT Tube.</p> <p>Instructions to the vendors/suppliers: All companies must give product data sheets confirming the specifications along with the tender. The compliance statement must be filled strictly under the heading given in the tender. Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered. Vendors are requested to see the site for installation of the CT.</p> <p>AERB site approval: Vendors will support Hospital authorities for getting AERB Site approval; Final responsibility will be of hospital authorities.</p> <p>CT Room as per AERB Safety Protection Interiors Works - CT scan machine should be provided on Turnkey basis Bidders are supposed to visit site before submission of tender. Layout plan preparation as per AERB.</p>	
















OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>Interior, Tiling, Electrification International standards. Lead lined doors as per AERB Safety Norms. Lead Equivalent viewing glass as mentioned in specs with lead framing entire console room. Trench up to UPS & Gantry. Split AC Standard brand 02 Ton total no - 02 1.5 Ton total no - 05 Earthing up to Electrical panel. Exposure warning indication system. 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. Turnkey bidder must coordinate with OEM/ Installation engineer. System interfacing cabling. Required furniture (Computer tables, revolving chairs, patient chair) in all the rooms -</p>	

4. COMPARATIVE STATEMENT OF "CT- 64 ANGIO DETECTOR"

<p>No. P-24011/EC-VIII/1TD- QRs/Mod- II/2015/MHA/PROV-1 dtd 20/10/2016</p>	<p>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.</p> <p>The model quoted should be, AERB Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: -</p> <p>Gantry: Aperture: 70 cms or more and Gantry tilt: ±24 degree or more physical tilt. FOV: 50 cms or more 3-D laser lights for positioning.</p>	<p>CT machine having 64 detector rows is able to take 128 slices per 360° rotation. Hence to be labelled as 128 slice CT machine whose QR's are separately attached. This entity may be</p>
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




OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Data Acquisition System: Detector- Capable of acquiring 64 or more slices per 360 degree of rotation. At least 32 or more rows of independent detectors are required with Z-axis coverage of 20 mm or more. Solid state or rare earth detectors of latest technology free from repeated calibration.</p> <p>Image Reconstruction: High-speed real-time reconstruction with display matrix of 1024 x 1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.</p> <p>Operator Console: High resolution medical grade LCD color monitors of 19 inch or more. Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation. Raw Data & Image storage with at least 500 GB Hard disc. System should have image storing capacity of 5,00,000 or more in 512x512 format. Auto-voice capability with custom designed key board and mouse. Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided.</p> <p>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 Hard disc storage capacity of 512 GB or more, with 19 inches or more high resolution medical grade colour LCD monitors capable of simultaneously viewing and performing all post processing functions and filming independently without the help of main console. Memory of the workstation should be independent of the console. Two-way data transfer between the operator console & the satellite workstation should be automatic and standard. Post Processing Soft-wares Perfusion CT for brain</p>	

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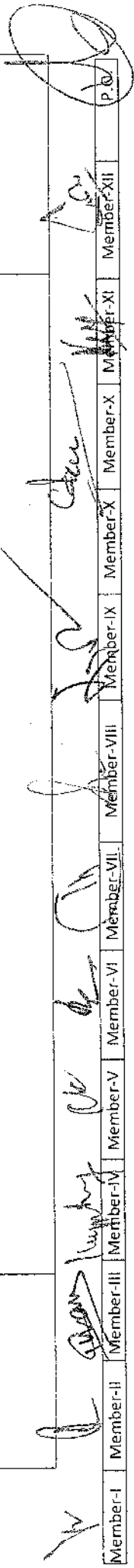
OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>CT Anglo, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view.</p> <p>Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps.</p> <p>Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction</p> <p>Automatic bone Removal facility.</p> <p>Dental CT.</p> <p>Lung nodule evaluation software. CAD for Lung nodule evaluation software should be quoted as optional.</p> <p>Liver segmentation display software in different colours, volume try Interactive & Automatic Cine display should be available.</p> <p>Image Evaluation Tools:</p> <p>Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms, Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.</p> <p>Distance & angle measurement, freely selectable, positioning of co-ordinate system, grid and image annotation.</p> <p>One similar independent post processing station (workstation, total no.1) with 01 additional viewing station for Radiologist. The necessary connectivity etc. for proper functioning should be provided by the vendor. All post processing facility and data archiving should be available independently at both the workstations.</p> <p>Must have internal minimum storage capacity of 5,00,000 images of 512x512 format.</p> <p>Workstation software / licenses must be from the same manufacturer.</p> <p>Patient communication system:</p> <p>An integrated intercom and Automated Patient Instruction System (API) should be provided.</p> <p>Two closed circuit TV for patient monitoring.</p> <p>Dry Laser Imager:</p> <p>Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500 Films) of 14x17 inch size along with System.</p> <p>Support Multiple Film Sizes: one of which must be 17"x14"</p> <p>DICOM 3.0 Compatible.</p>	

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OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>System Configuration Accessories, spares and consumables: Collapsible wheel chair with rubberized swivel wheels – 01 no. Standard Patient positioning accessories and restraining devices - 01 set. Light weight- ZERO LEAD Radiation protection aprons including Aprons -5 Nos. Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos. Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment. As per AERB recommendations Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes backup. Dual Head Pressure Injector with 100 syringes of 200ml. System must be PACS, HIS/RIS interface ready without any new hardware or software. A free comprehensive software update guarantee for entire life of scanner must be provided.</p> <p>Warranty: 60 months from the date of satisfactory installation. The warranty shall cover all the accessories, turnkey work including CT tube and all consumables.</p> <p>Comprehensive Maintenance Contract for next five years including all the accessories, Air conditioning and CT Tube.</p> <p>Instructions to the vendors/suppliers: All companies must give product data sheets confirming the specifications along with the tender. The compliance statement must be filled strictly under the heading given in the tender. Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered. Vendors are requested to see the site for installation of the CT.</p> <p>AERB site approval: Vendors will support Hospital authorities for getting AERB Site approval. Final responsibility will be of hospital authorities.</p>	

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>CT Room as per AERB Safety Protection Interiors Works - CT scan machine should be provided on Turnkey basis</p> <p>Bidders are supposed to visit site before submission of tender. Layout plan preparation as per AERB. Interior, Tiling, Electrification International standards. Lead lined doors as per AERB Safety Norms. Lead Equivalent viewing glass as mentioned in specs with lead framing entire console room.</p> <p>Trench up to UPS & Gantry. Split AC Standard brand 02 Ton total no - 02 1.5 Ton total no - 05 Earthing up to Electrical panel. Exposure warning indication system. MAP Approval by AERB.</p> <p>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. Turnkey bidder must coordinate with OEM/ Installation engineer.</p> <p>System interfacing cabling. Required furniture (Computer tables, revolving chairs, patient chair) in all the rooms -</p>	
<p>5. COMPARATIVE STATEMENT OF "DEXA BONE DENSITOMETRY"</p> <p>No. P-24011/ EC-VII/1TD- QRs/Mod- II/2015/MHA/ PROV-1 dtd 20/10/2016</p>	<p>Technical details:</p> <ul style="list-style-type: none"> • Fan-Beam Technology • Patient part localizer cross hair laser light • One Pass Acquisition Technique; Multi-Detector Array Scanning Method • High-resolution multi-element detector array with gadolinium sulfoxylate GADOX scintillator technology - 200 detectors or more • High Frequency X-ray Generator • X-ray System Switched-pulse dual-energy (100 kVp/140 kVp or more) 	<p>Newer specification machines offer better technology and imaging quality.</p>
















OLD QRs	PROPOSED QRs	JUSTIFICATION
	<ul style="list-style-type: none"> • Motorized Table and Rotating C-arm • Internal continuous calibration • Computer Console. 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 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 : 227kg or more <p>Standard Configuration:</p> <ul style="list-style-type: none"> • DXA Operating System • Automatic PASS/FAIL Quality Control • Fast/ExpressBMD 10 Second or less Acquisition • Single Energy Scan Display Capability • Window/Level Control for Image Optimization <p>Exposure Time and dose:</p> <ul style="list-style-type: none"> • Lumbar spine..... 10 sec / 0.04 mGy or less • Proximal Femur 10 sec / 0.04 mGy or less • Single Energy femur 15 sec / 0.025mGy or less • IVA in High Definition ... 15 sec / 0.025 mGy or less 	

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5. COMPARATIVE STATEMENT OF "MAMMOGRAPHY MACHINE"

OLD QRS	PROPOSED QRS	JUSTIFICATION
<p>No. P-24011/ EC-VII/1TD- QRs/MoD-II/ 2015/MHA/ PROV-1 dtd 20/10/2016</p>	<p>X-RAY GENERATOR</p> <ul style="list-style-type: none"> • High Frequency X-Ray Generator with 50KHz frequency should be provided. • Power of generator should be 5KW or more • Maximum mA output should be more than 120mA • KV Range should be 20 to 39KV or more in steps of increment of 1 KV each. • mAs Range should be from 1 mAs to 650 mAs or more. <p>X-RAY TUBE</p> <ul style="list-style-type: none"> • A Rotating Anode X-Ray Tube having dual focus should be provided. • Focal Spots should be <ul style="list-style-type: none"> ○ Small Focus = 0.1 or better ○ Large Focus = 0.3 or better • Target Material: - Molybdenum • Anode Heat Storage Capacity should be min 300KHU or more • Collimator: Light Beam collimator with bright light source & Auto shut off facility of Light source should be provided <p>STAND ASSEMBLY</p> <ul style="list-style-type: none"> • A compact Stand supporting an Iso-Centric gantry containing X-Ray Tube & Bucky Assembly should be provided. • Vertical Movement (Motor operated). • Motorized rotation: +90 degree to -90 degree or more. • Source to image distance (SID) should be 600mm or more • Switches for up/down movement of Gantry, placed conveniently on both sides of machine frame should be provided. • Compression release: Automatic release of Compression if there is Power Failure. • Paddles: Round Spot Paddle, Tilt-able compression paddle with size of 24 x 30cm 	<p>Newer specification machines offer better technology and imaging quality.</p>

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>• 24 x 30cm Bucky with 24x32 cm Grid of 5:1, 31 lines/cm or more should be provided.</p> <p>• Cone for Localization & Radiation protection should be provided.</p> <p>• Magnification Device: 1.8 X or more should be provided.</p> <p>• Transparent Lead Glass Screen for Operator Protection should be provided.</p> <p>FLAT PANEL DETECTOR (FPD): A complete imaging solution with cutting edge of performance integrated with our X-ray systems should be provided. The detector should be In-direct/direct conversion with A-Si (amorphous silicon) and CsI as scintillator.</p> <p>Size of detector must be 24cm x 30cm or more. Active Image matrix 2.8K x 3Kor 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</p> <p>ACQUISITION SOFTWARE should have below features: Standard features detail</p> <ul style="list-style-type: none"> • GUI based integrated panel for X-ray & Image parameters control. • Image acquisition, processing & storage in DICOM 3.0 platform • Operating Modes <ul style="list-style-type: none"> ○ APR with manual override ○ AEC dual shot exposure <p>X-ray generator control: -</p> <ul style="list-style-type: none"> • KV & mAS increase/ decrease switches • APR & AEC Mode selection switches • APR for automatic exposure parameters selection as per Fatty, Normal & Dense breast • Focal Spot Large/ Small selection • Filter Mo/ Rh selection • Editing/Save of Exposure parameters, Filter & Focal spot in APR Views 	

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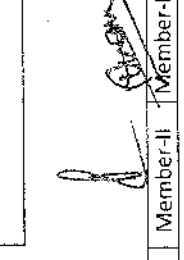
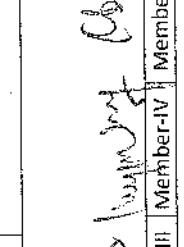
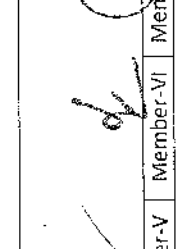
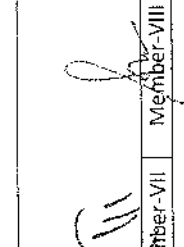
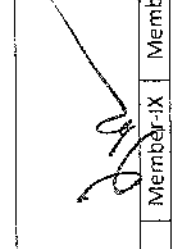
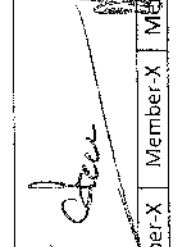
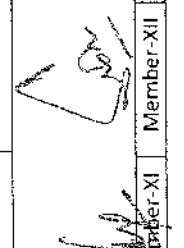
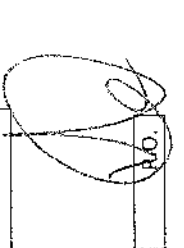



OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>IMAGE PROCESSING</p> <p>Pre- processing features: -</p> <ul style="list-style-type: none"> • Separate login for manager & technician. • New patient entry manual, Synch with MWL & emergency • Sort of patient data based on day, date, week & Patient ID. • Refresh facility • Total exam counts as per selected period for accepted & rejected images • Lock/Unlock the study for protection & editing. <p>Post processing features: -</p> <ul style="list-style-type: none"> • Image preview time in less than 10sec • Symphony tools for image processing. • KV & mAs stored with image properties • Image reversal-Left to Right & Top to Bottom • Image rotation Clock wise & anticlock wise in 900 step or more • Window width (WW) & Window level (WL) adjustment for brightness & contrast. • Dynamic Zoom with pan • Image Invert / Negative Image • Magnifying Glass • True Image 1:1 • EXI value indication to indicate over/ under exposure • Pre-set multiple image layouts • Reset tab to restore to the default parameters of image <p>Text & Annotation</p> <ul style="list-style-type: none"> • Additional of pre-defined text markers • Addition of user defined text • Addition of Arrow • To clear selected and All annotation from image 	

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Measurements Features</p> <ul style="list-style-type: none"> • Length / Distance measurement • Angle measurement • SNR calculation • Mean & median calculation <p>Print Facility</p> <ul style="list-style-type: none"> • Offered software is compatible to connect with normal printer & with dry laser DICOM printer • Customizable user selectable multiple print layout • Print status facility • Mammography specific DICOM print layouts <p>Connectivity & storage Features</p> <ul style="list-style-type: none"> • Storage of images on CD/DVD with inbuilt DICOM viewer software enables to view images on any PC. • DICOM 3.0 ready to connect with any DICOM 3.0 modality (like PACS, RIS/HIS/ Dry laser printer) • LAN connectivity to transfer the image to another system. • On line review of Software. • Compatible with BAR Code reader <p>Monitor: 1 No. 19" or more medical display monitor should be provided</p> <p>POWER SUPPLY REQUIREMENT</p> <ul style="list-style-type: none"> • Single Phase, 230 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. <p>Other Requirements:</p> <ul style="list-style-type: none"> • The company should be ISO company with CE Certified products with notified number. • The unit should be approved by AERB. • The company should have a local Service center. • The company should have proven track record in Govt. sector. • Firm should provide demonstration /training regarding the equipment at user location. <p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	
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7. COMPARATIVE STATEMENT OF "1.5 TESLA MRI PLANT"

OLD QRS	PROPOSED QRS	JUSTIFICATION
<p>No. P-24011/ EC-VII/1/TD- QRs/MoD-II/ 2015/MHA PROV-1 dtd 20/10/2016</p>	<p>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.</p> <p>Magnet Cooling System: Helium Capacity: 800 Liters ~ or more, Helium Boll off rate: 0.03 liter/hour or less Magnet Parameter: Field Stability: <0.1ppm/h</p> <p>Homogeneity: 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. (ii) Should be very good for Single voxel and CSI Spectroscopy. Specify values (iii) The homogeneity of the system should be better than 0.85ppm over 45cm DSV (Guaranteed homogeneity) (iv) Automatic shimming in phantom. Please quote the shim value at 10x10x10 mm3</p> <p>Gradient performance for each axis: Actively shielded gradient system in X, Y, Z planes 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</p> <p>Wide Bore Magnet: Magnet length: 155cm or less Inner Diameter/ Bore Opening range: 63cm- 70 cm</p>	<p>Newer specification machines offer better technology and imaging quality.</p>













											
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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Gradient System: Active shielded (AS) whole-body gradient coil system Should have lower eddy current Water-cooled coil and amplifier/air</p> <p>Gradients: Resolution Parameters: Matrix: 1024 FOV: 5 to 50cm Resolution: Min. Slice Thickness 2D: 0.1mm, Min. Slice Thickness 3D : 0.05mm</p> <p>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.</p> <p>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 Willis. 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). Body Coil (1): – Capable of doing abdomen, pelvis & MRCP imaging. It must have at least 16 elements and 50cm along with parallel acquisition techniques Breast coil 4 Channel. Dedicated Foot/Ankle 8 channel and above Dedicated lower extremity/peripheral angio coil: 16 channel and above Suitable wrist coil (6 channel and above)</p>	

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





OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>High resolution flicker-free LCD Monitor Screen size: Within 21" - 24" Screen matrix: 1920 x 1200 or more</p> <p>Image reconstruction speed: Matrix 256 x 256, 100% F.O.V: 9,000 recons/s or more (Higher is preferred) 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:</p> <ul style="list-style-type: none"> Spin Echo (Single, Double and Multi Echo) Inversion Recovery (IR) Field Echo (FE) Radial Scan (e.g. BLACE/ Propeller/ RADAR/Multi Vane) Regional Shimming to improve homogeneity after entering patient into the Gantry. EPI/DWI Contrast Enhanced MRA Time Resolved Contrast Enhanced MRA (e.g. TRICKS/TWIST/4D TRAK/TRAQ) Angiography Imaging (PC/TOF) Gradient Motion Re phasing (flow compensation) Fat Water Saturation Water Excitation technique for fat suppression function Parallel Imaging (e.g. ASSET /PAT/SENSE/SPEEDER/RAPID) Multi-slice multi angle capability 2D Evaluations and quantitative analysis functions MIP and MPR Perfusion Imaging <p>Application packages: Cardiac package: bright and dark blood imaging. Neuro package – for comprehensive head and spine examinations. Must include protocols for diffusion imaging, perfusion imaging, MRS and fMRI Angio package – MR Angiography (Contrast & Non contrast) and Venography.</p>	

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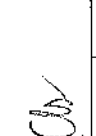
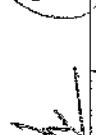
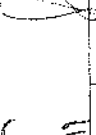
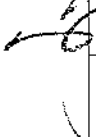
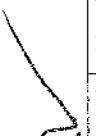



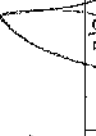
OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>Body package – for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, MR Urography. Must allow multi-breath-hold examinations as well as free breathing examinations.</p> <p>Protocols for morphology and contiguous coverage of both breasts simultaneously.</p> <p>Ortho package – comprehensive protocols for joint and spine imaging.</p> <p>Pediatric package – special neuro and cardiac imaging protocols by weight.</p> <p>Advanced application packages:</p> <p>Whole Body Imaging – whole body imaging with the TR coil which is embedded in the gantry.</p> <p>Whole Spine – Automatic whole spine composing facility</p> <p>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.</p> <p>3D VRT for colored volume rendered images.</p> <p>Neuro Perfusion evaluation software for post processing of brain perfusion data sets.</p> <p>Proton Spectroscopy to examine metabolic changes in the brain such as tumors and degenerative disease.</p> <p>Integrated software package with sequences and protocols for proton 2D/3D Chemical Shift Imaging (CSI) to examine metabolic changes in the brain (e.g. in tumors and degenerative diseases).</p> <p>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.</p> <p>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).</p> <p>Diffusion Tensor Imaging (DTI) – Acquisition of data sets with multi directional diffusion weighting to assess anisotropic diffusion properties of the brain.</p> <p>DTI Tractography – Visualization of multiple white matter tracts based on diffusion tensor imaging data to support the pre-surgical planning and to allow for neuro physiological research with respect to connectivity and white matter pathology.</p> <p>Sound less MRI for all sequences is required, mention the technology name</p>	

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII	Member-XIII	Member-XIV	Member-XV	Member-XVI	Member-XVII	Member-XVIII	Member-XIX	Member-XX	Member-XXI	Member-XXII	Member-XXIII

OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Accessories to be supplied: One latest generation laptop for online reporting. (16GB Ram, 1TB hard disc, 13 inch) Color laser printer (all in one. Scan, copy, print) To be supplied with three tray dry laser printer of above 550dpi. Mention the make of the printer. To be supplied with 10 packets / 1250films of 14x17 size. Dual Head MRI Compatible Pressure Injector with 200 sets of syringes. One suitable, 160KVA, silent Diesel Generator with auto switch over and AMF panel. One non-ferromagnetic height adjustable patient transfer trolley of reputed make. MRI compatible Fire Fighting System, Detectors with Fire Extinguishers. Hand held metal detectors (04) Two metal detector doors to be installed at the entrance points. Closed Circuit CCD Camera MR Compatible Oxygen cylinder - 4 nos. 200 DVD and 10 pen drive (32 GB) MRI compatible medicine trolley (02), wheel chair (02) MRI room oxygen deficiency level monitor MR compatible Non-magnetic IV stand. Suitable true online UPS unit for 30 minutes power backup during scan. 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 Chiller (Dedicated of MR) with soft starter RF Cabin for shielding the magnet: Power requirement: 3 Phase 380 to 440 V±10%, not more than 50 KVA Input, Line Frequency : 50Hz ± 1Hz Warranty: Full warranty with Machine for 5 Years & CMC for next 5 years. Or as asked in BOQ. An on-site MRI engineer should be posted exclusively at the facility for the duration of the guarantee period to assist in system maintenance, troubleshooting and research.</p>	

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

OLD QRs	PROPOSED QRs	JUSTIFICATION
	<ul style="list-style-type: none"> • The system should have Quick View mode for 2D & CDI Preset selection during exam and minimum 8 sub preset for 2D & CDI Modes • All the transducers are broadband with multi frequency capability. • Minimum 15 frequency can be selected in combination of different modes • System Depth should be minimum 40cm • The Monitor size should be more than 19" medical Grade LCD. • The Monitor Display either Normal Display along with Thumbnail view of stored images and option to select Big Image by Large View and Full Screen mode. • The freely fully programmable, mode-sensitive more than 8" Color Touch Command Screen enable direct access to all basic and advanced system controls. • All Panel keys should customize according to user preferences • The system should have single key image optimization for 2D and Doppler • The System should High Dynamic range of 180db or more.. Higher Dynamic range will be Preferred. • The system should have 256 gray scales • The System should have Side/ Vertical Display of 2D Images should be possible to improve the Examination Efficiency for Superficial Tissue and MSK Applications. • The System should have 3 active Transducer ports. • The System should have pulse subtraction / Pulse Inversion Tissue Harmonic Imaging for Better Contrast and Less Side Lobe Artifact 	

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

OLD QRS	PROPOSED QRS	JUSTIFICATION
	<ul style="list-style-type: none"> The System Should be Next Generation Tissue Harmonic Imaging by Transmitting Two Band width of Information and Receiving Difference of Two Band Width and Second Harmonic of Primary Band width Resulting Uniform Image Quality from Near to Far Field and No Need to Select Different Frequencies for Every Patient. The System should select at least Two Levels for Better Matching Frequency Band width. System Should have Receiving End Frequency and Spatial Compound Imaging Technology for Retaining Clinical Artifact and Compound Imaging Should work all the Probes also Color and Doppler Modes should Possible to Select, during Compound Imaging The System should have advanced Real time Spatial Compound Imaging with multiple Levels Selections The system should have new method of signal processing techniques to enhance ultrasound beam data by including information from adjacent lines to allow early identification of diffuse random noise and structural boundaries and to improve resolutions and give uniform homogenous image, and It should be minimum 5 steps selection should be possible. The system should have advanced wide band color Doppler imaging mode with directional in formations without blooming / over painting for low flow applications The System should have Directional Power Doppler Imaging mode. The system should have elastography function and software. The system should have PW Doppler & HPRF mode for All Transducer's. Pw Sample Gate selection should have multiple steps selection should be possible. 	









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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>The System should have option of Real time 4D iProbe for Radiology and OB Gynae Applications. It should Also Perform Slice View, Volume view, Volume Color, Direct C Plane view.</p> <ul style="list-style-type: none"> 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. <p>Measurements and Calculations:</p> <ul style="list-style-type: none"> Measurement should be possible on frozen images and Images Recalled from the Image archive. The System should have Comprehensive set of Measurements in OB / Gyn Applications Template customization should be possible. EDD should Display all OB Measurements Average US EDD and LMP EDD should display during scanning. LMP GA should display on Monitor screen during scanning. IUGR Graph should be available On Board Report for all Packages – Report transfer to Print Page along with Selected Images through normal PC Printer without any hard ware. <p>PROBES Following Probes should be supplied along with system:</p> <ul style="list-style-type: none"> Convex probe with bandwidth of 1-6 MHz Volume convex probe with bandwidth of 1-6 MHz TV/TR probe with bandwidth of 4-10 MHz Linear Probe with bandwidth of 5-14 MHz Phase array sector probe for neonatal application with band width of 4-9 MHz 	

Member-1	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII	P.D.
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OLD QRs	PROPOSED QRs	JUSTIFICATION
	<p>STANDARD, SAFETY & TRAINING:</p> <ul style="list-style-type: none"> - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. <p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	
<p>9. COMPARATIVE STATEMENT OF "500 mA DIGITAL X-RAY MACHINE (WITHOUT FLUOROSCOPY)"</p> <p>33 (D)</p>	<ul style="list-style-type: none"> • System should be capable of performing exposure in vertical, horizontal and oblique position to perform all skeleton body (upright and lying down) radiographs. • Unit should be completely integrated (integrated generator and image acquisition) and X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality • It is possible to do all the general radiological imaging like abdomen, musculoskeletal, joints, PNS, Skull and Spine etc. with movement of tube assembly with auto position/auto tracking in vertical position. • Unit should be High frequency Digital Radiography system with rotating anode X-Ray tube. 3D ceiling suspended stand with Auto tracking & 2 separate fixed detectors in table bucky and vertical bucky each. <p>HIGH FREQUENCY GENERATOR:</p> <ul style="list-style-type: none"> • Generator should be of latest technology with high frequency 40 KHz or more X-Ray generator. Power output of 50KW or more • KV range should be 40 to 125KV in 1KV/step. • mA output: more than 500mA. (500mA at 100KV) • mAs range should be from 1mAs to 200mAs or more <p>X-RAY TUBE: A Dual focus Rotating anode X-ray tube.</p> <ul style="list-style-type: none"> • Focal spots of tube should be: Small focus: 0.6 or less, Large focus: 1.5 or less • Large Anode Heat storage capacity of more than 150KHU. • Collimator: Multileaf collimator with LED light source with high lux output. 	<p>Newer specification machines offer better technology and imaging quality.</p>

Member-I	Member-II	Member-III	Member-IV	Member-V	Member-VI	Member-VII	Member-VIII	Member-IX	Member-X	Member-XI	Member-XII
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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>TUBE STAND:</p> <ul style="list-style-type: none"> • Ceiling mounted tube stand with 3-dimensional motorized movements of the tube head covering a huge area. • Motorized movements in longitudinal, Vertical and transverse direction with control from panel mounted on Tube collimator assembly. • Tube stand with actuator based/ telescopic noiseless swift motorized up/down movement • Manual Override of Longitudinal & Transverse direction movements with electromagnet locks • Tube head Rotation (along vertical axis): ± 1800. • Tube assembly should have 3D auto tracking on its control for synchronization with the detector fitted inside the vertical bucky stand & table. <p>VERTICAL BUCKY STAND:</p> <ul style="list-style-type: none"> • Floor mounted Motorized Vertical bucky stand should have inbuilt FPD (FLAT PANEL DETECTOR) for lung and skeleton x-ray examinations. It should have user friendly design and handling. • VB stand should have provision to do chest radiography with and without grid. • Motorized Tilting should be -30 degree to + 90 degree. • Vertical up Down Movement should be 1200mm or more. • AEC mode with use of ion chambers should be provided which enables auto selection of radiographic factors, saves time, eliminates retake, increases diagnostic capability and lowers radiation dose, calibrated to multiple exposure classes/densities. <p>TABLE:</p> <p>Mobile Diagnostic table should be provided.</p> <ul style="list-style-type: none"> • 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. 	

	Member-I		Member-II		Member-III		Member-IV		Member-V		Member-VI		Member-VII		Member-VIII		Member-IX		Member-X		Member-XI		Member-XII
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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>FLAT PANEL DETECTOR: Specifications:</p> <ul style="list-style-type: none"> The detector should be flat panel type with A-Si (amorphous silicon) and CsI as scintillator. Size of detector must be 43 cm. x 43 cm or more Active Image matrix 3K x 3K or better Image depth should be 14bit or better Pixel size should be 150um or less (Smaller pixel size is preferred) Detector resolution should be more than 3.3 lp/mm DQE (Detector Quantum Efficiency) should be more than 65%. <p>OPERATING STATION/WORK STATION: X-RAY/IMAGE CONTROL CONSOLE</p> <p>Fully integrated system with following features:</p> <ul style="list-style-type: none"> Digital Display of KV & mAs. KV & mAs increase and decrease control on Graphical user interface Ready and X-Ray ON indication on Graphical user interface. Self-diagnostic Program for error code display of faults such as Earth fault error, KV error, Filament error & Tube's Thermal Overload. An Inbuilt overload protection device. Anatomical Programming Radiography (i.e. APR): Preprogrammed parameters of human Anatomy which helps the user to select exposure parameters based on body part, examination view and size of the patient. Since it is a computer-based system (full system integration) so any number of Organ programming combinations is possible. User can define his own Organ parameters and can edit the existing parameters to his satisfaction and comfort level. APR programs: More than 1000 programs. (Expandable as per user's requirement). A dual action hand Switch with Retractable cord for Radiation Protection of Operator. <p>IMAGE ACQUISITION SOFTWARE AND ITS CHARACTERISTICS</p> <p>Software provides complete control of all image capture functions within the examination room. It enhances the entire workflow by delivering diagnostic images instantly. It also allows user to transfer X-Ray images electronically to remote workstations, image archives, and printers, also has an excellent performance on-image quality control such as:</p>	













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





OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>STANDARD, SAFETY & TRAINING:</p> <ul style="list-style-type: none"> - The company should be ISO, EN-ISO& ICMED certified. - The unit should be approved by AERB. - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. <p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	

10. COMPARATIVE STATEMENT OF "MULTI LOADER CR SYSTEM"

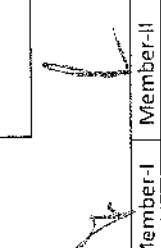
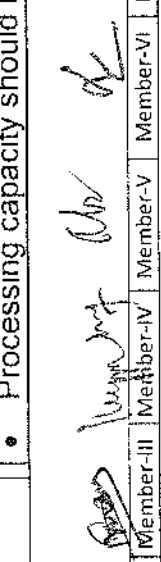

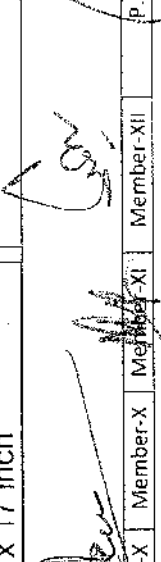
33 (D)	<p>Technical Specifications</p> <p>Specification for the multi loading computed radiography system-for high resolution digital radiography the computed radiography system (CR System) should be made of: -</p> <ul style="list-style-type: none"> ➤ Imaging plates and cassettes ➤ Image reader system. ➤ Preview station/CR console ➤ Patient/cassettes identification ➤ CR work station ➤ Laser Imager <p>Imaging plates (IPs) and cassette. CR System compatible imaging plate of following sizes are required.</p> <ul style="list-style-type: none"> • 35 cm x 43 cm=2 nos • 35 cm x 35 cm=2 nos • 24 cm x 30 cm=2 nos • 18 cm x 24 cm=2 nos • Mammography Cassettes of both size 02 cassettes of each size total 04 nos. 	Newer specification machines offer better technology and imaging quality.

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

OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Image reader (Multi Loader Image Reader). The model quoted should be of latest version.</p> <ul style="list-style-type: none"> • Multi loader image reader which can stack 4 or more cassettes and have 4 or more input slots with following features: - • It should be able to process all standard size cassettes and imaging plates from 8 x 10 inch to 14 x 17 inch. • It should be able to process mammography cassettes and imaging plates with >15 pixels/mm resolution • Processing capacity should be of 100 or more IPs/ hour of size 35 cm x 43 cm. • Image preview time should be less than 50 sec. • It should have various image processing protocols for respective regions of the body (anatomical presets). • It should have capability for accepting exposed imaging plates without patient demographics for causality/trauma workflow requirement • Depth acquisition resolution should be 12 bits or more. • Reading sampling resolution should be 5-20 pixel/mm or more for 14" x 17: • It should have ability to route the images to multiple destinations like work stations laser camera etc. • It should have storage capacity of at least 2000 images locally without recourse to a workstation and have capability of retrieving at least last 10 scanned images as part of contingency plan. <p>Preview station/CR Console.</p> <ul style="list-style-type: none"> • It should have preview station/console with 19 inch or more good resolution antigrare flicker free TFT/LCD color monitor having standard features software • It should have customizable graphic user interface (GUI) touch screen. • It should have software which enables to see in the preview terminal the deviation from normal exposures should have indication of over exposure & under exposure on the preview station • It should have the facility of auto-routing images to pre-defined DICOM destinations and also possible to direct print the images without going to CR Work Station. • It should have preferably the facility of pan zooming rotation window level adjustment in the image edge enhancement noise reduction latitude reduction etc. 	

Member-I  Member-II  Member-III  Member-IV  Member-V  Member-VI  Member-VII  Member-VIII  Member-IX  Member-X  Member-XI  Member-XII  No. 

OLD QRS	PROPOSED QRS	JUSTIFICATION
	<p>Patient/cassettes identification.</p> <ul style="list-style-type: none"> • Should have bar code reader or another patient/cassettes identification system. <p>DEDICATED ADVANCED WORK STATIONS OTHER THAN CONSOLE</p> <ul style="list-style-type: none"> • Should have 19 inch or more antiglare flicker free medical grade TFT/LCD flat monitor with at least one mega pixel resolution of standard made like BARCO • Should have 320 GB or more storage capacity (hard disk) with 4 GB or more RAM latest high-speed core 2 duo or any other processor of 3.0 GHz or more speed and have CD & DVD burner • Should have latest windows based original software • It should accept images from, CR reader without loss of any data. • It should have built-in routine for using predefined image processing parameters for image quality enhancement • It should have mechanism for storing the patient image based on name data exam etc. • It should have capability of storing user defined image processing parameters capability of overwriting predefined image parameter with user defined parameters & storing these two images separately • It should be able to process the raw image data of CR reader and have capability of window level adjustment flipping rotating zooming collimating annotating latitude reduction image noise reduction grey scale saturation feedback electronic shuttering grey scale reversal etc. • It should have provision for customized printing formats in different layouts • It should have auto routing incoming image to predefined DICOM store or print destination • It should have mechanism for printing multiple images in one film with possibility of slide and true size printing • It should be able to connect with other DICOM system such as MR work station CT work station etc. <p>Dry Laser Imager</p> <ul style="list-style-type: none"> • A dry laser chemistry imager capable of printing images in high quality • Printing resolution should be 500 DPI or more for all the films size. • Processing capacity should be 100 sheets per hour more of 14 inch x 17 inch 	







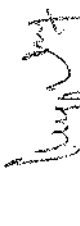
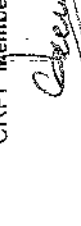

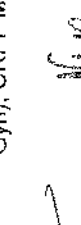

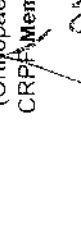





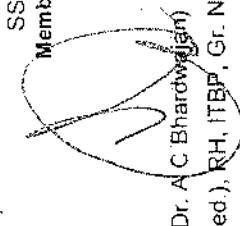
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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<ul style="list-style-type: none"> • Pixel depth architecture/gray scale resolution should be 14 bits or more • Image resolution/Pixel size should be 100 microns or less • Time required to first print should be less than 100 sec for 14 inch x 17 inch • Film loading system should be daylight film loading and there should be no use of chemicals • It should be able to support at least four standard films size. • It should have at least three film sizes on line. • It should have automatic quality/density control system to maintain the quality of image printing • It should have high speed DICOM print server. • It should have compatibility of networking & connectivity there should be the provision of direct connectivity to any DICOM MODALITY & on installation there should be available essential provision of connection to at least 6 DICOM modalities for high volume centralized USG, CT, MRI, CR, DR, C Arm printing applications • It should be capable of printing in different layouts formats on single films customized layouts & formats should be independent of films sizes. • Image memory should be 512 MB. <p>SOFTWARE</p> <ul style="list-style-type: none"> • The system should include the following software application as standard • Quality control software. • Software masking of the collimation areas. • Special attention should be placed on pediatric and mammography applications. • Software for printing on any DICOM printer and to print user defined formats and layouts (multiple images on film, true size printing etc.) • Software for storing images on any DICOM (or Newer Versions) complaints stations. • Annotation software advanced annotation features like customizable text arrows and other markers and measurements tools should allow free text to be applied to the image without interfering with the image • Black border/black surround or similar masking software. • It should have provision of processing for expanded visualization for optimal viewing of structures with vastly different densities like DRC EVP or similar. • Grid detection & grid pattern removal software. 	

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OLD QRS	PROPOSED QRS	JUSTIFICATION
	<ul style="list-style-type: none"> Should have built in image processing software. The CR System should have compatibility of upgradeability of PACS. The CR System should have a separate online UPS compatible with the unit to take care of power failure for at least 30 minutes backup of the whole system The CR system should have software security features like user names & password to relevant unauthorized option. The company should provide demonstration of the quoted equipment and final technical Approval will be based on satisfactory demonstration. <p>Standards, Safety and Training</p> <ul style="list-style-type: none"> Should be FDA or CE. Manufacturer should have ISO certification for quality standards Comprehensive training for technical staff and support services till familiarity with the system <p>Documentation</p> <ul style="list-style-type: none"> User/Technical/Maintenance Manuals to be supplied in English <p>Warranty and CMC</p> <ul style="list-style-type: none"> 5 years warranty on all supplied items 5 years annual Comprehensive Maintenance Charge (ACMC) service 	

 (Dr. V. Chatopadhyay) BSF Member-I
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 (Dr. Rohit Shyam Bobill) CMO(SG) (ENT) RH, ITBP, Gr. Noida Member-II
 (Dr. Shaifali Gupta) Comdt /Spl. Gr.I (Ophthalmology), ITBP, Member-VIII
 (Dr. Saqib Khan) CMO (OG) (Radiology) CRPF, Member-III
 (Dr. Rajkamal Nimesh) Comdt /Spl. Gr-I (Surgery), ITBP, Member-IX
 (Dr. R. Kuppam Samy) CMO(SG) (Paediatrics) CRPF Member-IV
 (Dr. Gairi Devi) CDS (SG), (Dental), SSB Member-X
 (Dr. Chandrima Kar) Comdt /Spl. Gr. I & (Obs Gyn), CRPF Member-V
 (Dr. Neelaj Kumar) CMO, (Medicine), ITBP Member-XI
 (Dr. Anurag Jain) Contractual, Spl (Orthopaedics), CRPF Member-VI
 (Dr. Sumanesh Ghosh) Comdt./Spl. Gr. I (Pathology) ITBP Member-XII

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

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

S. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
1.	<p>High frequency Mobile Digital Radiography machine with a touch screen & a portable Wi-Fi flat panel detector of size 35 cm X 43 cm or more</p> <ul style="list-style-type: none"> It is a light weight machine which allows the user easy maneuverability in congested areas of wards, ICU's or hospital/clinic. Its ergonomic articulated spring balanced or articulated tube stand allows the operator to position the tube for acquiring the images of desired views. The X-Ray generator, detector and console software should be from same manufacturer for seamless connectivity and consistent image quality. Touch screen tablet for instant review of image. Compact and light weight. 	<p>Check data sheet and physically and also ask the under taking from manufacturer</p>	<p>Should comply as per requirement</p>
2.	<p>GENERATOR & TUBE X-Ray Generator Type: High frequency microprocessor controlled Power Output: 4.2 KW or more Generator Frequency: 110Khz or better KV Range: 40 to 120 KV or more in 1 KV/step. Maximum mA: 100 mA or more mAs Range: 1-200 mAs</p>	<p>Check data sheet and physically.</p>	<p>Should comply as per requirement</p>
3.	<p>Dual action hand switch & IR remote for ready & Exposure should be provided.</p>	<p>Check Physically</p>	<p>Should comply as per requirement</p>
4.	<p>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</p>	<p>Check data sheet and tube make model</p>	<p>Should comply as per requirement</p>
5.	<p>Conversion screen/ Scintillator: Cesium Iodide (CsI)</p>	<p>Check data sheet</p>	<p>Should comply as per requirement</p>

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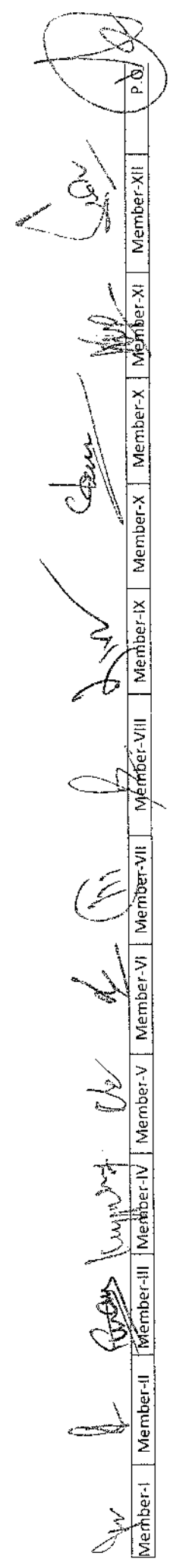
Appendix-1B(XLV)

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

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

Appendix - '1B(XLVI)'

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



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








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

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

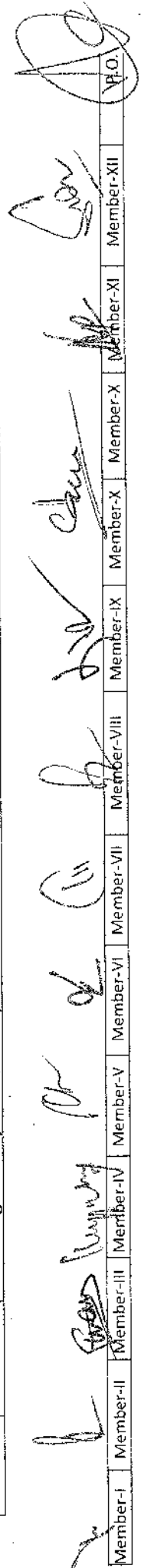
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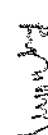

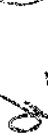






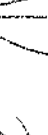

(Signatures and initials of members)

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

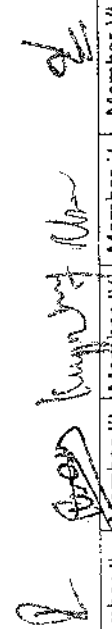
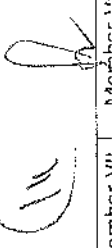

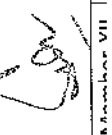

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
	<ul style="list-style-type: none"> - Self diagnostic Program for error code display of faults such as Earth fault error, KV error, Filament error & Tube's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



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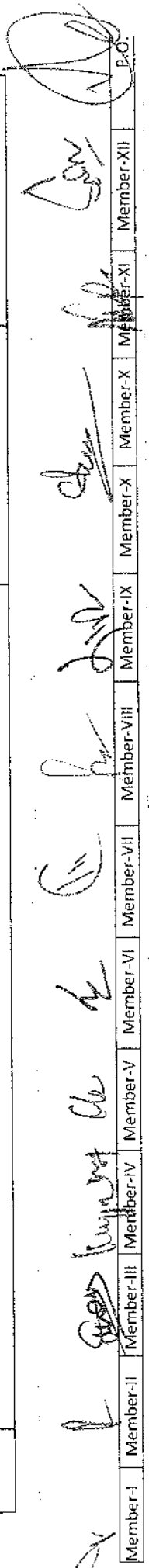
S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED/ DESIRED
	<ul style="list-style-type: none"> • True size for printing. • Hard disc capacity for image storage >3000 images or more • Inbuilt CD/DVD writer facility <p>FULL DICOM 3 COMPATIBILITY</p> <ul style="list-style-type: none"> • Get DICOM work list • DICOM Print • DICOM Store • Support DICOM MPPS 		
10	<p><u>MONITOR:</u> 1 No. 19" or more LCD/TFT/LED monitor should be provided.</p>	Check Physically the size of the monitor	Should comply as per requirement
11	<p>POWER SUPPLY REQUIREMENT: Three Phase, 400 Volts AC 50Hz with line resist 0.2 Ohms. Line Regulation \pm10%.</p>	Check the data sheet	Should comply as per requirement
12	<p><u>ACCESSORIES:</u></p> <ol style="list-style-type: none"> 1. Servo Voltage Stabilizer of Suitable rating 1 NOS. 2. 2 Tray Dry laser Chemistry Printer 1 NOS. 3. Lead Aprons - 02 Nos. 4. LEAD PROTECTION SCREEN 1 NOS. 	Check the offer and take the undertaking from vendor. In offer make and model has to be mention of all accessories	Should comply as per requirement
13	<p>STANDARD, SAFETY & TRAINING:</p> <ul style="list-style-type: none"> - The company should be ISO, EN-ISO&ICMED certified. - The unit should be approved by AERB. - The unit should be European CE Certified from Notified body. - The company should have a local Service center. - The company should have proven track record in Govt. sector. - Firm should provide demonstration /training regarding the equipment at user location. 	Physically check the all certificates.	Should comply as per requirement
14	<p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	Physically check the all certificates.	Should comply as per requirement














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

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



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














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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
05.	<p>COLLIMATOR:</p> <ul style="list-style-type: none"> 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 1 no. manual collimator having bright light source and auto shut provision on the ceiling stand for 2nd tube should be provided Field of View is 43 cm x 43 cm or more 	<p>Check Physically on Tube</p> <p>Check Physically on Tube</p> <p>Check Physically on Tube and table</p> <p>Check Physically on table.</p>	<p>Should comply as per requirement</p>
06.	<p>TABLE:</p> <ul style="list-style-type: none"> Remote controlled, motorized RF Table should be provided. Table should have integrated console. Table should have scratch resistant tabletop. Table should have soft start and stop with following minimum features. Motorized Tilt: Vertical +90° to -90° or more Trendelenberg. Table has automatic stop at Horizontal & Vertical position during tilt movement Motorized Transverse movement of tabletop: 20 cm or more Table with height adjustment facility Motorized Longitudinal movements of imaging unit i.e. Tube column - detector movement: 100 cm or more. Tube Oblique movement Integrated bucky for flat panel detector for general radiography and fluoroscopy. Remotely operated compression device. Foot switch for releasing fluoroscopy and acquisition. Patient weight carrying capacity: 200 kg or more Intercom system to communicate with the patients. 	<p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table</p> <p>Check Physically on table/console</p> <p>Check Physically on table side</p> <p>Check Physically on table</p> <p>Check Physically on table/console room</p>	<p>Should comply as per requirement</p>


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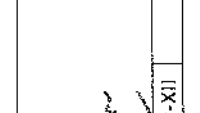


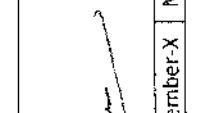

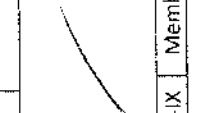






Appendix-1B(LIV)

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

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
















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

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











Appendix - '1B(LVII)'

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

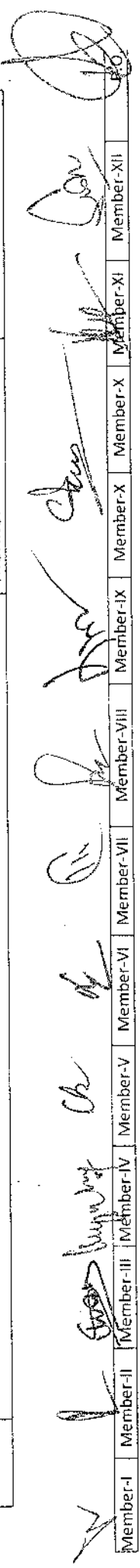














4. QRS/SPECIFICATIONS & TRIAL DIRECTIVES FOR 64 SLICE CT SCAN MACHINE/ CT-64 ANGIO DETECTOR

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	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.	Check Product datasheet and console monitor	Should comply as per requirement
	The model quoted should be, AERB, Type approved and US FDA / European CE certified. The essential requirements of the system are as follows: -	Check desired certifications issued by respective authorities	
1	<u>Gantry:</u>		
•	Aperture: 70 cms or more and Gantry tilt: ± 24 degree or more physical tilt.	Check Product datasheet / physically	Should comply as per requirement
•	FOV: 50 cms or more	Check Product datasheet and console monitor	Should comply as per requirement
•	3-D laser lights for positioning.	Check Product datasheet / physically	Should comply as per requirement
2	<u>X-Ray Generator:</u>		
•	High Frequency type.	Check Product datasheet	Should comply as per requirement
•	Power output: 50 KW or higher	Check Product datasheet	Should comply as per requirement
•	mA Range: 20-300 mA (With incremental steps of 10mA).	Check Product datasheet and console monitor	Should comply as per requirement
•	KV Range: 80-110 or more	Check Product datasheet and console monitor	Should comply as per requirement

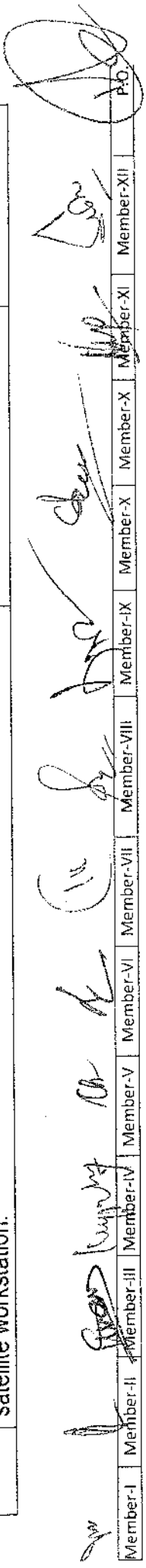
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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
3	<p><u>X-Ray Tube:</u></p> <ul style="list-style-type: none"> • Tube Voltage: 80-110 kV or more • Minimum Anode Heat Storage Capacity of at least 5 MHU and higher MHU or direct cooling tube 	<p>Check Product datasheet and console monitor</p> <p>Check Product datasheet</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p>
4	<p><u>Patient Table:</u></p> <ul style="list-style-type: none"> • Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less. • Metal free scan-able range of 150 cm or more. • Floating table top with foot pedal/hand control for positioning 	<p>Check Product datasheet and Patient Table / console monitor</p> <p>Check Product datasheet and Patient Table / console monitor</p> <p>Check Product datasheet and Patient Table physically</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p>
5	<p><u>Spiral Acquisition:</u></p> <ul style="list-style-type: none"> • Scan Time should be 0.5 sec or less for full 360-degree rotation. • Minimum slice thickness should be 0.625 mm or less. • Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.56 to 1.5 or more. Specify all possible pitch selections. • Bolus Triggered or bolus chase spiral acquisition should be available. 	<p>Check Product datasheet and console monitor</p> <p>Check Product datasheet and console monitor</p> <p>Check datasheet / console monitor</p> <p>Check Product datasheet / console monitor</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p>















Appendix-1B(LX)

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
•	Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual.	Check Product datasheet / console monitor	Should comply as per requirement
6	<u>Image Resolution:</u> High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV. Low contrast resolution – 5 mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.	Check Product datasheet Check Product datasheet	Should comply as per requirement Should comply as per requirement
7	<u>Data Acquisition System:</u> Detector- Capable of acquiring 64 or more slices per 360 degree of rotation. At least 32 or more rows of independent detectors are required with Z-axis coverage of 20 mm or more. Solid state or rare earth detectors of latest technology free from repeated calibration.	Check Product datasheet and console monitor Check Product datasheet and console monitor Check Product datasheet	Should comply as per requirement Should comply as per requirement Should comply as per requirement
8	<u>Image Reconstruction:</u> High-speed real-time reconstruction with display matrix of 1024 x 1024 or more. Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.	Check Product datasheet and console monitor	Should comply as per requirement
9	<u>Operator Console:</u> High resolution medical grade LCD color monitors of 19 inch or more. Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation.	Check Product datasheet and console monitor physically Check Product datasheet and console monitor	Should comply as per requirement Should comply as per requirement

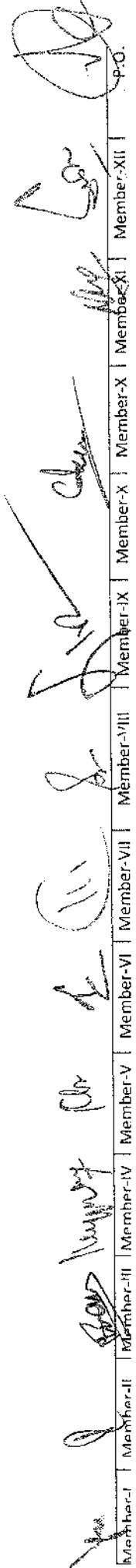


S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Raw Data & Image storage with at least 500 GB Hard disc. System should have image storing capacity of 5,00,000 or more in 512x512 format.	Check Product datasheet	Should comply as per requirement
	Auto-voice capability with custom designed key board and mouse.	Check Product datasheet and physically	Should comply as per requirement
	Archiving options: CD-R/ DVD, should be available. 500 rewritable DVDs should be provided.	Check technical offer	Should comply as per requirement
10	<u>Workstation and Client Server architecture</u>		
	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.	Check product / WS Datasheet and technical offer	Should comply as per requirement
	Memory of the workstation should be independent of the console.	Check product / WS Datasheet	Should comply as per requirement
	Two-way data transfer between the operator console & the satellite workstation should be automatic and standard.	Check product / WS Datasheet	Should comply as per requirement
	Post Processing Soft-wares		
(i)	Perfusion CT for brain	Check WS Datasheet and quotation	Should comply as per requirement
(ii)	CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion, Vessel segmentation, luminal view.	Check WS Datasheet and quotation	Should comply as per requirement
(iii)	Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps.	Check WS Datasheet and quotation	Should comply as per requirement
(iv)	Cardiac application package should include Plaque analysis, Calcium Scoring, Cardiac functional analysis and ECG gated reconstruction	Check WS Datasheet and quotation	Should comply as per requirement
(v)	Automatic bone Removal facility.	Check WS Datasheet and quotation	Should comply as per requirement
(vi)	Dental CT.	Check WS Datasheet and quotation	Should comply as per requirement

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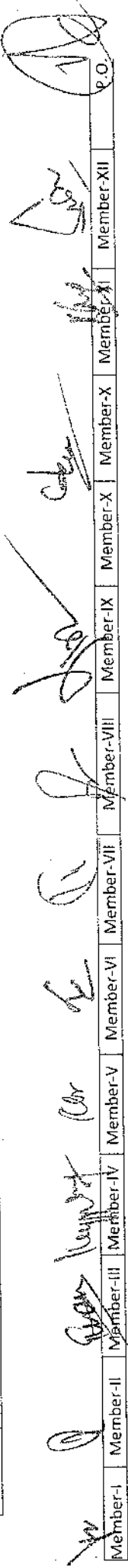
Appendix-'1B(LXII)'

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



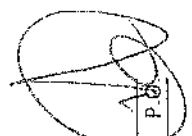
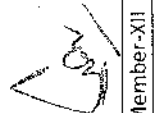
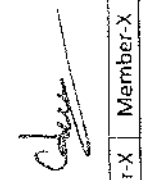
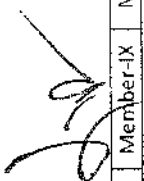
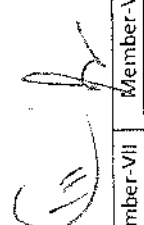
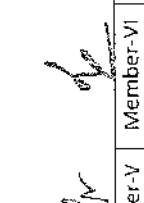
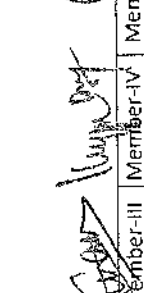
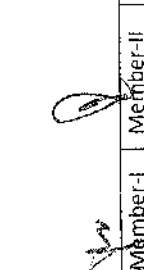
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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1.	Resolution: 16 bits/ 500 dpi or more with minimum three ports. Supply 4 packets (500) Films) of 14x17 inch size along with System.	Check technical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



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

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

5. QRS/SPECIFICATIONS & TRIAL DIRECTIVES OF DEXA BONE DENSITOMETER

S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
1	<p><u>Technical details:</u></p> <ul style="list-style-type: none"> Fan-Beam Technology Patient part localizer cross hair laser light One Pass Acquisition Technique; Multi-Detector Array Scanning Method High-resolution multi-element detector array with gadolinium sulfoxylate GADOX scintillator technology - 200 detectors or more High Frequency X-ray Generator X-ray System Switched-pulse dual-energy (100 kVp/140 kVp or more) Motorized Table and Rotating C-arm Internal continuous calibration Computer Console. 	<p>Check with Data sheet</p> <p>Check physically on machine</p> <p>Check one pass physically on table and Data sheet for detector</p> <p>Check with data sheet</p> <p>Check data sheet</p> <p>Check physically on monitor and data sheet</p> <p>Check physically on machine</p> <p>Check data sheet</p> <p>Check physically</p>	Should comply as per requirement

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S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
2	Standard Computer Hardware: <ul style="list-style-type: none"> • Computer Workstation with Dual Core 3 GHz or better • Windows operating system • 1 TB or better hard drive, 4 GB RAM or more, DVD RAM drive, external hard drive 2TB x 2 nos. • 19" or more Widescreen LCD/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 	Check physically on monitor /data:sheet as applicable	Should comply as per requirement
3	Standard Configuration: <ul style="list-style-type: none"> • DXA Operating System • Automatic PASS/FAIL Quality Control • Fast/Express BMD 10.Second or less Acquisition • Single Energy Scan Display Capability • Window/Level Control for Image Optimization 	Check physically on monitor /data sheet as applicable	Should comply as per requirement
4	Exposure Time and dose: <ul style="list-style-type: none"> • Lumbar spine..... 10 sec / 0.04 mGy or less • Proximal Femur 10 sec / 0.04 mGy or less • Single Energy femur 15 sec / 0.025mGy or less • IVA in High Definition ... 15 sec / 0.025 mGy or less 	Check data sheet for dose and time, confirm physically	Should comply as per requirement
5	<ul style="list-style-type: none"> • Auto Hip Positioning • Reposition/Rescan Feature • Automatic Scan Comparison for Serial/ previous Exams Reporting Software <ul style="list-style-type: none"> • 10 Year Fracture Assessment • Dual Hip Report • Femur Fracture Assessment High Resolution Imaging Capability • Pediatric Analysis for Spine, Femur and Forearm • Pediatric Whole Body with Body Composition Assessment • Infant Scan • Small animal for research. 	Check data sheet and confirm physically Check data sheet and confirm physically	Should comply as per requirement

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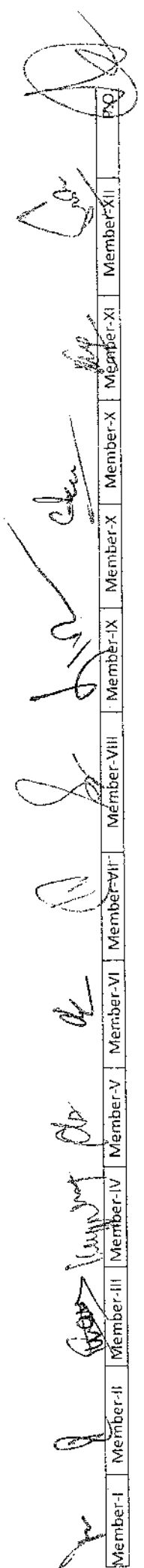
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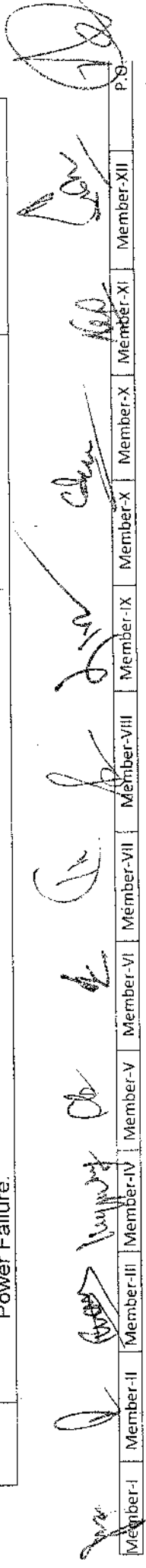
S NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
6	<p>Scan and Analysis Protocols:</p> <ul style="list-style-type: none"> • AP Lumbar Spine Analysis, Scoliosis Analysis • Supine Lateral Spine with Baseline Compensation • Proximal Femur Analysis and Hip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



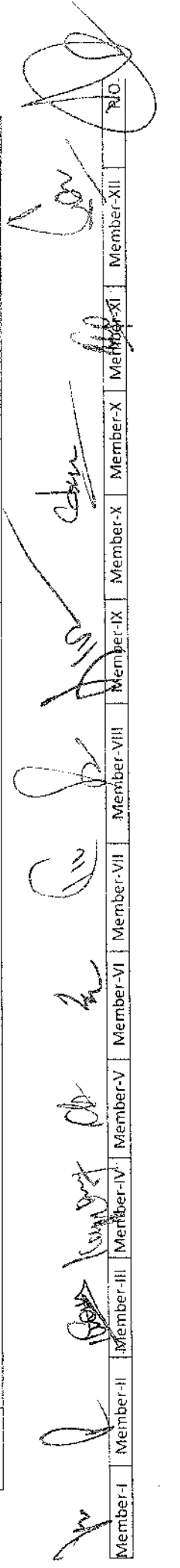
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6. QRSPECIFICATIONS & TRAIL DIRECTIVES OF MAMMOGRAPHY MACHINE

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

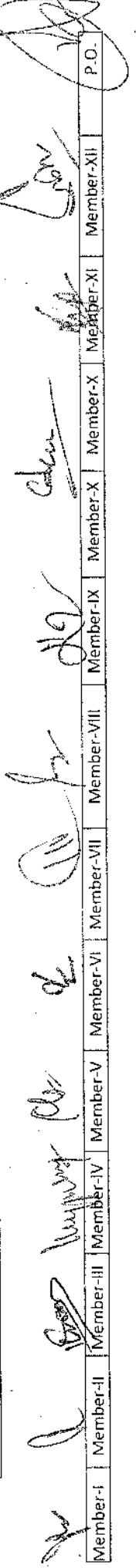


SI. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED / EXPECTED / DESIRED
4	<p>FLAT PANEL DETECTOR (FPD): A complete imaging solution with cutting edge of performance integrated with our X-ray systems should be provided. The detector should be In-direct/direct conversion with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



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

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



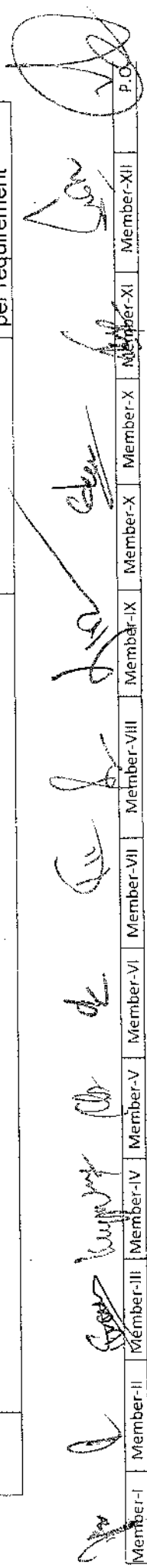
SI. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
11	<p>POWER SUPPLY REQUIREMENT</p> <ul style="list-style-type: none"> Single Phase, 230 Volts \pm 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. 	Confirm with data sheet	Should comply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


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


SI. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<p>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.</p> <p>Magnet Cooling System:</p> <ul style="list-style-type: none"> Helium Capacity: 800 Liters ~ or more, Helium Boll off rate: 0.03 liter/hour or less 	<p>Take undertaking from the vendor</p> <p>Check data sheet</p> <p>Check data sheet</p>	<p>Should comply as per requirement</p> <p>Should comply as per requirement</p> <p>Should comply as per requirement</p>


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Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Magnet Parameter: Field Stability: <0.1ppm/h	Check data sheet	Should comply as per requirement
	Homogeneity:		Should comply as per requirement
1.	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. (ii) Should be very good for Single voxel and CSI Spectroscopy. Specify values (iii) The homogeneity of the system should be better than 0.85ppm over 45cm DSV (Guaranteed homogeneity) (iv) Automatic shimming in phantom. Please quote the shim value at 10x10x10 mm ³	Take undertaking from the vendor	Should comply as per requirement
	Gradient performance for each axis:		
1.	Actively shielded gradient system in X, Y, Z planes	Check physically	Should comply as per requirement
2.	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	Check data sheet	Should comply as per requirement
	Wide Bore Magnet:		
	Magnet length: 155cm or less	Check physically	Should comply as per requirement
	Inner Diameter/ Bore Opening range: 63cm- 70 cm	Check physically	Should comply as per requirement
	Gradient System:		
	Active shielded (AS) whole-body gradient coil system	Check physically	Should comply as per requirement
	Should have lower eddy current	Check physically	Should comply as per requirement

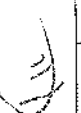



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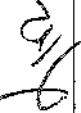
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
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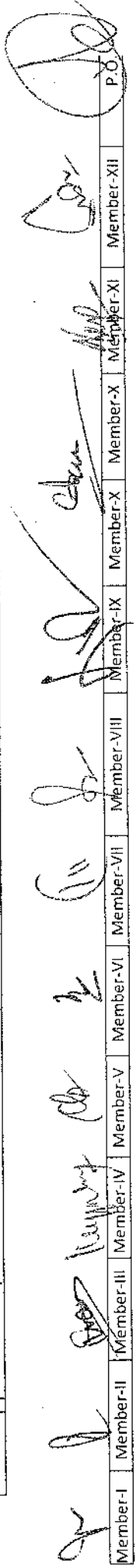
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Appendix-1B(LXXIV)

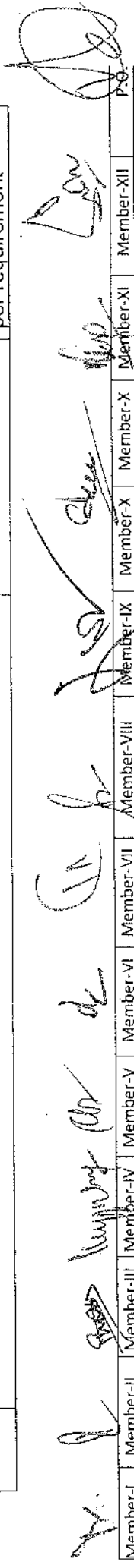
Sl. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Water-cooled coil and amplifier/air	Check physically	Should comply as per requirement
	Gradients: Resolution Parameters:		
1.	Matrix: 1024	Check data sheet	Should comply as per requirement
2.	FOV: 5 to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



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Appendix-1B(LXXV)

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



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Appendix-'1B(LXXVII)'

SI. NO.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	Load capacity 150 Kg or more	Check data sheet	Should comply as per requirement
	Table Side Control Both Side of the Gantry	Check data sheet	Should comply as per requirement
	Patient communication & Monitoring: Assistance call squeeze-bulb for patient	Check physically	Should comply as per requirement
	Intercom communication with the patient.	Check physically	Should comply as per requirement
	Volume of speaker / headphones in examination & control room for voice commands	Check physically	Should comply as per requirement
	LCD monitor in the console and built in camera in the magnet for viewing the patient	Check physically	Should comply as per requirement
	Physical Measurement Unit (PMU) for wireless physio control	Check physically	Should comply as per requirement
	Acquisition Workplace with single console: For Patient registration & pre-registration, Scanning, Reconstruction, Post-processing, Viewing, Data Storage, Filming	Check physically	Should comply as per requirement
	Processor: Inter Core 4 or more Duo or equivalent	Check physically	Should comply as per requirement
	Clock rate: 2.2 GHz or higher	Check physically	Should comply as per requirement
	Main Memory (RAM): 12 GB or more	Check physically	Should comply as per requirement
	Hard disk type should be as follows:	Check physically	Should comply as per requirement
	Image Storage Capacity (256 x 256): 900,000 images or more (Without Raw Data)	Check physically	Should comply as per requirement
	DVD-Multi Drive: DVD for long term achieving & CD for individual patient image achieving.	Check physically	Should comply as per requirement

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

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SI. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
8	<p>COMPRESSION: Compression Paddle should be designed to minimize Patient pain and discomfort perception. Movement:</p> <ul style="list-style-type: none"> • Motor driven compression • Manual compression <p>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.</p> <p>Digital Display</p> <ul style="list-style-type: none"> • Digital display of compression force • Digital display of Compression Breast Thickness (CBT) <p>Compression Paddle Type</p> <ul style="list-style-type: none"> • 24 x 30 cm • 18 x 24 cm • Spot compression paddle 12x18 cm <p>Straight round spot paddle</p>	<p>Check physically/data sheet</p>	<p>Should comply as per requirement</p>
9	<p>FLAT PANEL DETECTOR (FPD): A complete imaging solution with cutting edge of performance integrated with our X-ray systems should be provided. SPECIFICATIONS OF FLAT PANEL DETECTOR: In-Direct conversion type solid state flat panel detector. Size: 24cm x 30 cm. CONVERSION SCREEN/ SCINTILLATOR: Cesium Iodide (CsI) PHOTODIODE: amorphous silicon (a-si) Pixel pitch should be 85µm or less CAD & Breast Density Calculation Software should be provided.</p>	<p>Check physically/data sheet. Take undertaking from the vendor as applicable.</p>	<p>Should comply as per requirement</p>

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Sl. No.	SPECIFICATION	PROCEDURE SUGGEST FOR TRAIL FOR BOARD OF OFFICERS	RESULTED EXPECTED / DESIRED
	<p>POWER SUPPLY REQUIREMENT</p> <ul style="list-style-type: none"> - Single Phase, 230 Volts ± 10%, AC, 50 Hz, 15 Amps with Independent earthing on the wall socket. - Suitable rating UPS should be provided for the backup of software & Complete system. <p>OTHER REQUIREMENTS:</p> <ul style="list-style-type: none"> • The company should be ISO & ICMED certified with European CE Certified products with notified number. • The unit should be approved by AERB. • The company should have a local Service center. • The company should have proven track record in Govt. sector. • X-Ray generator, detector & software should be from same manufacturer for seamless connectivity and consistent image quality • Firm should provide demonstration /training regarding the equipment at user location. 		
10	<p>Warranty & CMC: 5 years warranty from the date of supply of unit and 5 years CMC after 5 years warranty period should be quoted by vendor</p>	<p>Physically check the all certificates.</p>	<p>Should comply as per requirement</p>

(Dr. J Chatopadhyay) BSF Member-I

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

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

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

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

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

(Dr. Rakesh Tiwari) CMO (SG) (Anaesthesia), ITBP Member-VII

(Dr. Shailesh Gupta) Comdt /Spl. Gr.I (Ophthalmology), ITBP, Member-VIII

(Dr. Rajkumar Nimesh) Comdt /Spl. Gr-I (Surgery), ITBP, Member-IX

(Dr. Gauri Devi) CDS (SG), (Dental), SSB Member-X

(Dr. Neel Kumar) CMO, (Medicine), ITBP Member-XI

(Dr. Soumyesh Ghosh) Comdt /Spl. Gr. I (Pathology) ITBP Member-XII

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