



CORRIGENDUM

**PROCUREMENT OF RADIOLOGY EQUIPMENT /
INSTRUMENTS AND ANCILLARIES
FOR DOW INSTITUTE OF RADIOLOGY**

**NIT No. DUHS/DP/2018/-31-32 Dated 18 January 2018
(Ref. No. DUHS/DP/2018/- 32)**

G: Corrected / Modified Technical Specifications

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
1.	<p>SINGLE PLANE DIGITAL ANGIOGRAPHY / INTERVENTION SYSTEM</p> <p>The single-plane C-arm system for digital acquisition designed to meet the requirements of modern general angiography and interventional procedures with Flat Panel Detector. Consisting of:</p> <p>1.1 Positioning Arm:</p> <ol style="list-style-type: none"> a. C-arm with motorized movements. Real time display of rotation angulations. The C-arm should have the possibility of head to toe coverage of the patient without repositioning the patient. b. Right anterior oblique (RAO) /Left Anterior Oblique (LAO): +/- 120° or more. c. Cranial / Caudal: Minimum + 50 / -45° or more (Capable of achieving Spider position). d. Rotation speed 25° / sec. or more in LAO /RAO e. Motorized parking (+/ - 120 deg. Motorized rotation of the C-arm) f. Integrated, computer-aided collision monitoring / Protection g. Programmable auto positioning of selected angulations. (50 or more programmable positions). h. Variable source-to-detector distance between 90 cm and 120 cm <p>1.2 Flat Panel Detector</p> <p>The high resolution dynamic flat panel detector with integrated detachable grid especially designed to fulfill the requirements for diagnostic and interventional cardiology & radiology.</p> <ol style="list-style-type: none"> a. Size: Dedicated cardiac Flat Detector (14 cm x 17 cm) ; b. Pixel size: 190 µm or less c. Spatial resolution: 2.5 - 2.7 LP/mm or preferably more. d. Fluoroscopy as well as image acquisition to be done in 16 bit digitization depth. e. Removable grid for dose saving in pediatric procedures. The grid to be preferably removed with push of a button <p>1.3 Patient Support / Table</p> <ol style="list-style-type: none"> a. Floor mounted examination table for angiography and interventions. b. Motorized height adjustment with variable speed. Floating tabletop with longitudinal and transverse / Trandelenburg movements. c. Left / right pivotal table rotation +/- 90 deg. or more d. Patient weight bearing capacity 200 kg or more. Capability to handle additional load (100 kg) for CPR procedure. e. Accessories - Arm cradles (pair), Unilateral armrest, Infusion bottle holder, <p>1.4 X-Ray Generator</p> <ol style="list-style-type: none"> a. Microprocessor based high frequency X-ray generator b. Output Power 100 KW. Radiographic rating minimum 1000 mA at 100 KV. c. The system should have capability of digital radiography and fluoroscopy. Should have capability of doing digital pulsed fluoroscopy at 10, 15 & 30 pulses / sec. d. Maximum continuous fluoro output power to be 3 KW or more to ensure good image quality during fluoro at oblique angles. e. Shortest Exposure time of less than 1msec with automatic exposure control. 	1 No.

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	<p>f. Should be capable of providing 250 mA or more current during digital pulsed fluoroscopy at small focus</p> <p>1.5 X-Ray Tube</p> <p>a. Triple focus X-ray tube with anode heat storage capacity of at least 3.2 MHU or better</p> <p>b. Liquid bearing technology for longer durability and quiet operation.</p> <p>1.6 DIGITAL IMAGING SYSTEM (ACQUISITION / FLUROSCOPY)</p> <p>a. Acquisition, storage and display in 1024 X 1024X 12 bits.</p> <p>b. Real time filtering, online edge enhancement, noise reduction (spatial filtration), pixel shift / remasking, and dynamic real time Pan / zoom.</p> <p>c. Hard Disk/Magnetic Disk Capacity for storage of 25,000 frames with 1024X1024X 12 bits matrix</p> <p>d. DICOM 3.0 with standard exchange media.</p> <p>e. The system must have DICOM send & DICOM Query / Retrieve facility</p> <p>f. Digital pulsed fluoroscopy with 7.5 or 10, 12.5 or 15 and 25 or 30 frames per second in 1024X1024X 10 bits or more.</p> <p>g. Display of scene directory for easy selection of any image or scene from the examination room or control room</p> <p>h. Radiation-free positioning of the primary and semi-transparent diaphragms by means of graphic display in the LIH (Last Image Hold).</p> <p>i. Variable Copper filtration during fluoroscopy and acquisition for radiation protection 0.1 mm to 0.9 mm Cu at least 05 filters.</p> <p>j. The selection of the Cu filters must be automatic by the system based on patient weight / absorption without any user interaction.</p> <p>k. Display of the measured dose-area product and the calculated patient air kerma reference on the flat screen display in ceiling suspension</p> <p>l. The system to display the dose information in DICOM format after every examination.</p> <p>m. Vessel analysis SW</p> <p>n. Automatic positioning of the c-arm corresponding to reference image and vice versa.</p> <p>o. Simultaneous display of fluoroscopy and reference images.</p> <p>p. The system must have online image density (gray scale) correction i.e., Automatic online image density correction of dynamic scenes and single images for clear view in the bright and dark areas of the image.</p> <p>q. X-ray optimization before fluoro with built-in intelligence.</p> <p>r. Facility to review previous studies in the examination room from the patient's old CD.</p> <p>s. The system should have the capability for retrieval of angio/CT/MR images back into the digital imaging system from the CDs and/or the network.</p> <p>1.7 Controls of Digital Imaging System:</p> <p>All controls of digital imaging system must be available in the examination as well as control room.</p> <p>1.8 CD / DVD recorder</p> <p>CD/DVD drives for automatic digital image storing on CD-ROM for off-line data exchange in DICOM 3 format. The system must archive the images/scenes onto the CD in background, without blocking ongoing cine acquisition</p>	

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	<p>1.9 <u>Networking</u> Network interface (100 BaseT) with the following integrated DICOM 3 services: DICOM Send, DICOM Storage Commitment (StC), DICOM Query and DICOM Retrieve</p> <p>1.10 <u>Monitors for the System</u></p> <ol style="list-style-type: none"> a. Active Matrix TFT monitors having high resolution b. Monitors should be ceiling-mounted in the operating/examination room. c. Two 19 inch active matrix digital TFT monitors (resolution min. 1024 x 1280) for live and reference images in the operating/examination room. Maximum brightness of the imaging monitors: 500 cd/m² OR one 30 inch large display for live and reference images (preferred); having 1600 x 2500 resolution and maximum luminance of 600 ad/m² d. 19 inch monitor active matrix TFT monitor for live images in the control room. Maximum brightness to be 200 cd/m³ or more. e. Data for display of system and table geometry, system messages as well as dose is to be displayed either on the imaging monitors or on a separate monitor integrated into the ceiling suspension system. <p>1.11 <u>Physiological hemodynamic monitoring system must be quoted separately</u> Multichannel (20 channels or more) to record at least 4 channels IBP. Surface ECG in any configuration and simultaneous 12 lead ECG, NIBP and SaO₂ measurement.</p> <ol style="list-style-type: none"> a. The system must be complete with software for pediatric & adult, right / left heart, angio / valvular homodynamic examinations including functionality for homodynamic calculations such as gradients, valve areas, and shunt. Including annotations and 12 channels ECG. b. Digital display of all the parameters like IBP, Heart rate etc. It should be possible to print the waveforms simultaneously while acquiring the data in the background. c. It should be possible to store the waveforms on the hard disk / CD of the physiological recording system. The system should include following: <ul style="list-style-type: none"> • 2 x invasive blood pressure reusable transducer. • Reusable interface for 12 lead ECG. • NIBP cuffs (2 Nos.) • Holder for mounting the IBP transducer alongside the patient table. d. The system should have 40 GB or more hard disk for permanent storage. e. Two color monitors 19 inch Active matrix TFT inside the control room. f. One 19 inch monitor in the examination room that should be installed on the ceiling suspension with two monitors of imaging system. g. DVD / CD writer for archiving of study data and wave form stored on the hard disk. h. Facility of freezing the homodynamic data and simultaneous recovery of recent data / compare stored data with current waveform. i. Tableside control of the Haemodynamic system in the examination room (separate price to be offered). j. Bi-directional communication between Haemodynamic system and Digital System of Main angio machine for transfer of patient demographic- and X-ray data <p>The Haemodynamic system preferably from original manufacturer of angio graphic system.</p>	

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	<p>1.12 <u>Surgical shadow-less light ceiling suspended.</u> a. Ceiling suspended Lead Glass for Upper Body Radiation Protection b. Lower body radiation protection flaps</p> <p>1.13 <u>1 x Fully programmable latest model contrast medium injector with 200 disposable syringes</u> Other Allied Accessories a) One Postscript level Network Laser Printer for taking image printouts on paper. This printer is to be connected with the Main Digital Imaging System. b) Lead Glass Window size 5 x 3 feet. Pb equivalence 2 mm or better c) Intercom for communication between control and exam room d) Lead Apron with gonadal shielding and thyroid shielding Qty: 06 each e) Lead goggles (fit over) light weight Qty: 06 f) Accessories set for peripheral studies Qty: 01 Set</p> <p>160 KVA UPS compatible for the whole system with back-up time of 10 minutes for fluoro and cine acquisition (MGE, APC, and Chloride).</p> <p>1.14 <u>POWER MANAGEMENT:</u> a) 380V, 50HZ.</p> <p>1.15 <u>Offer should be complete with following.</u> b) UPS with complete unit for 10 min. c) With All other peripheral items like necessary printer. d) Offer should be complete with installation, preparation of room, including distribution board ac and chiller according to the equipment's requirements. e) Five year warranty with service and including tube and detector with unlimited exposures. f) The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value.</p> <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • Units which is offered should be substantiated with the list of installation at different sites other than Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
2.	<p>WHOLE BODY CT SCAN MACHINE 16-SLICE</p> <p>2.1 GENERAL: a. Latest Generation Whole Body CT Scanning machine for general purpose, multi-slice technology of 16 -Slice per rotation with helical/spiral scanning capabilities.</p>	1 No.

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	<p>2.2 GANTRY:</p> <p>a. Gantry Bore diameter 70 cm or more.</p> <p>b. Tilt at least + 30° from the normal position.</p> <p>c. Minimum scan length of the table should be 1500 mm. Spiral scan duration up to 100sec.</p> <p>d. FOV: Maximum field of view to be 50cm.</p> <p>2.3 X-RAY GENERATOR:</p> <p>a. The X -Ray generator should be of 50 KW or more.</p> <p>b. High frequency type generator.</p> <p>c. KV range selectable between 90KvP and 1 40kVP or more. Current range of 20mA to 400 mA or more.</p> <p>2.4 ROUTINE SCAN TIME:</p> <p>a. 0.5 Second or less for 360 degree scan.</p> <p>2.5 DETECTORS:</p> <p>b. Should be ultrafast solid state / ceramic detector, compatible with multi slice CT scanner.</p> <p>c. Low contrasts detestability of 5mm at contrast difference of 3HU (0.3%).</p> <p>2.6 SLICE THICKNESS/ COLLIMATION:</p> <p>a. Multiple slice thickness options, selectable with minimum slice thickness of 0.625mm - 0.75mm or better.</p> <p>2.7 X-RAY TUBE:</p> <p>a. Anode heat storage capacity should be at least 5.0 MHU or more.</p> <p>2.8 COOLING SYSTEM:</p> <p>a. Water to water / oil / air heat exchanger for the dissipation of heat generated in the gantry.</p> <p>2.9 TABLE:</p> <p>a. Motorized table with weight bearing capability of 200 kg or more.</p> <p>2.10 HELICAL MODE:</p> <p>a. Full range of all helical / spiral studies / capabilities should be included.</p> <p>2.11 SYSTEM COMPUTER:</p> <p>a. Quad Core Xeon Processor 2.33GHz/64 Bit RISC or better with compatible software or better</p> <p>b. System architecture and operating system must be based on latest capacity.</p> <p>c. Multitasking and parallel processing CPU system with 64-bit word.</p> <p>d. Hard drive capacity should be 1TB or more. Storage capacity should be 200,000 images or more.</p> <p>e. Access to raw data files and images should be available.</p> <p>f. Image zoom, pan, evaluation, measurement and annotation facilities should be present. Image reconstruction speed of 16 images / sec for 512 x 512 matrix.</p> <p>g. Real time MPR / Multi -planner reformatting.</p> <p>h. DVD/CDR/MOD storage device (re -writeable) should be available. Compatible keyboard.</p> <p>2.12 OPERATOR CONSOLE:</p> <p>a. High resolution flicker free LCD 19” or more color monitor of 1024 x 1024 or better display matrix with keyboard and mouse control.</p> <p>b. Intercom for patient monitoring and instructions.</p> <p>c. Lead Glass 5 x 3 feet</p>	

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	<p><u>Offer should be complete with following ancillaries.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With all other Peripheral items like printer, one viewing work station, one Work station complete with post processing capability and connectivity with the existing network. • C.T Injector • Offer should be complete with installation, preparation of room including light, distribution board AC and air-conditioning for the equipment. • Five-year warranty with service, including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • 4 to 6-week training of Radiologist at any English-speaking country hospital where the offered equipment is installed. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
3.	<p>DIGITAL MAMMOGRAPHY UNIT WITH STEREO BIOPSY</p> <p>3.1. HIGH FREQUENCY X-RAY GENERATOR:</p> <ul style="list-style-type: none"> • 5 KW • 20 — 40 KV (1 KV STEPS}, higher will be preferred • mAs range 5 - 500 mAs. • Exposure Time 4 - 6sec • Exposure Mode: Manual & Automatic (AEC). • Automatic Exposure mode should have automatic selection of Track, filter, kv and mAs. . <p>3.2. C ARM with source to detector distance 65 cm or more.</p> <ul style="list-style-type: none"> • Motorized Isocentric rotation • User defined Motorized compression device with safety release. • Rotation 160 - 180° <p>3.3. X-RAY TUBE WITH ROTATING ANODE</p> <ul style="list-style-type: none"> • Tube type should be rotating with dual material anode preferred material would be Molybdenum and Tungsten. Tube should comprise of all this material. • Four focal spot 0.1 & 0.3 and dual focus in each track preferred. • Anode heat storage capacity 300kHU or better. 	1 No.

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	<ul style="list-style-type: none"> • System should have separate monitoring software for tube overload protection <p>3.4. COLLIMATION</p> <ul style="list-style-type: none"> • Manual & Automatic. • Automatically switching light centering device. • Collimators should have at least two filters Molybdenum 0.03mm or better, and Rhodium 0.025mm. <p>3.5. DIRECT / INDIRECT CONVERSION FULLFIELD FLAT PANELDETECTOR 24 X 30 CM FORMAT.</p> <ul style="list-style-type: none"> • DEPTH 14 -BIT or more • PIXEL PITCH: 100 X 100 μM and RESOLUTION: 3062 X 2394 PIXELS or better • DQE: 60 % or more <p>3.6. REMOVABLE GRID {RATIO 5:1, 30 LP/MM or better}</p> <ul style="list-style-type: none"> • Should have motorized Grid • Should have Breast support for Geometric Magnification. <p>3.7. ACQUISITION WORKSTATION :</p> <ul style="list-style-type: none"> • Intel /AMD Dual Core HP or Equivalent brand from original Manufacturer workstation. • Memory should be 2 GB RAM or better • Should be able to store up to 25,000 images or more. • 3 MP LCD Monitor Medical Grade. • Compression force display • Rotation Angle Display. • Breast Thickness display with Thickness Compensation Algorithm. • Processing Features should include: • Dose Calculation information /AGD [Average Glandular Dose) • Zoom & Pan • Magnifying glass • Flip, rotation of image. • Inversion • Measurement and Annotation Tools. • Should have online / built -in UPS for avoiding loss of information • Emergency Stop button <p>3.8. REPORTING WORKSTATION</p> <ul style="list-style-type: none"> • Latest workstation from the original manufacture with the undertaking that the same workstation having supplied with this machine all over the world and should be manufactured by the original Manufacturer of Digital Mammography system. • 2 Intel/AMD Xeon or Equivalent processor for High Density image processing. • Storage HDD 2 TB or more. _ • 32 GB RAM. Or more • DVD, /RW optical Device. • Workstation should have 19” - 2 MP Medical for Patient and Report Management. 	

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	<ul style="list-style-type: none"> • Dual 5 MP 21” Medical Grade Monitor for image Review. • The work station should be multimodality and should be able to review and analyze from other breast imaging modalities from ultrasound and MRI for Comprehensive Diagnosis should have the connectivity with the existing network • Dedicated Measurement tool for distance, area and angle measurement. • Should have free continuous zoom and quadrant zoom functions with panning and navigation zoom function. • Integrated reporting tool. • Zoom and Pan images. • Magnifying glass • Invert and graphical annotation through shapes. • Rotate or flip. • Should have ability to display Computer Aided Detection (CAD) markers for micro - calcification and markers. • Should have the ability to support CAD supported reports. • Should have DICOM functions (Print, Storage. Query & R e t r I e v e modality work list) <p>3.9. STEREO BIOPSY DEVICE</p> <ul style="list-style-type: none"> • Stereotaxy device should be easy to install and should be able to perform fine needle aspiration, core biopsy, vacuum assisted biopsy or hook wire placement. • Needle approach should be Automatic and Manual motor driven both. • Should have Vertical and lateral Approach for easy access to breast lesions. • Should have three axis in both Vertical and lateral Approach • Should provide phantom for Quality checks. • Should also include Stereotaxic positioner and paddle. • Should include lateral and vertical approach kit and metal guides <p>3.10. STANDARD ACCESSORIES :</p> <ul style="list-style-type: none"> • 24 x 30 cm compression paddles. • 19 x 23 cm sliding compression paddle. • 24 x 30 cm flexible & sliding compression paddle • 19 x 23 cm flexible & sliding compression paddle • Wall mount stand for paddles & stereo device. • Gridless device for geometric variable • Magnification 1.5x and 2x. • Two pairs of compression foot paddle. • X-ray control push-button with extensible cable. • X—ray shield from original manufacturer integrated with acquisition console for protection. • Laser printer capable of printing of 10 x 12 and 14 x17 films with two packets of films for testing purpose. • Two set of special illuminators for viewing the mammograms. • Ups to run the whole system with minimum 20 min backup • Standard manuals, calibration equipment and quality control devices should be part of the system. 	

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	<ul style="list-style-type: none"> • Lead apron, female and male should be provided at least 6 each • 2 magnifying glass hand mirrors for viewing <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 20 min. • With all other Peripheral items like printer, one viewing work station, one Work station complete with post processing capability and connectivity with the existing network. • Offer should be complete with installation, preparation of room including light, distribution board AC and air-conditioning for the equipment • Five-year warranty with service, including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices • The system should be upgradable to Advance applications 3D TOMOSYNTHESIS. • Application training in house two weeks by the application specialist at site. • 4 to 6-week training of doctor at any English-speaking country hospital where the offered equipment is installed. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
4.	<p>DIGITAL X-RAY FLUOROSCOPY UNIT FOR CONTRAST STUDIES</p> <p>4.1 X-RAY GENERATOR:</p> <ul style="list-style-type: none"> • High frequency inverter type microprocessor controlled. • Three phase 80 Kw/150 kV or more. • Maximum 800 mA or more @ 100kVP. • 40 to 150 kV or more with digitally increasable KVp. • Exposure time 5.0 ms. to 10 seconds or better. • Fluoroscopy kVp range 50 to 120 kVp. • Automatic over-load protection device and automatic line compensation. • System with AEC / ABC and APR Facility. <p>4.2 X -RAY TUBE:</p> <ul style="list-style-type: none"> • Anode heat storage capacity of at least 300 KHU or more. • Rotating anode X-ray Tube, with dual focus, small 0.5 – 0.6mm & large 1.0 -1.5 mm. 	1 No.

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	<p>4.3 AUTOMATIC X RAY BEAM COLLIMATOR</p> <p>4.4 IMAGE INTENSIFIER / MONITORING SYSTEM:</p> <ul style="list-style-type: none"> • High resolution 12'' or better Image Intensifier with high sensitive CCD camera. • Central resolution: 50 Lp/cm or more. • Reduction of Quantum noise with CCD technology. • High contrast ratio: 28:1. • High resolution and excellent MTF characteristics with superior image quality. • Function brightness and contrast control. • Two 15 to 18 inch TFT/LCD flicker free monitor one at console and other in examination room. <p>4.5. REMOTE CONTROL TABLE WITH TOMOGRAPHY AND SPOT FILM IMAGING DEVICE:</p> <ul style="list-style-type: none"> • Tilting table 90^o/15 degrees or more. • Anti-collision security system. • Longitudinal travel of table/spot film/imaging device 70 cm or more. • Transverse travel + /- 12 cm or better. • Motorized compression cone. • Table accessories compression band, hand grip with rail, foot rest, climbing step, shoulder support. <p>4.6. IMAGE INPUT</p> <ul style="list-style-type: none"> • Continuous fluoroscopy:1024 × 1024 pixels @ 15 fps or more • Radiographic image acquisition:1024 × 1024 pixels • Maximum number of images: 150 images per examination or more <p>4.7 IMAGE STORAGE</p> <ul style="list-style-type: none"> • Hard Disk: 20,000 images or more • Optical drive: DVD drive provision • Cine view: Cine view with optional reference monitor (to be quoted as standard) Sub-display with main diagnostic display Suitable fluoroscopic image: New AEC; Auto-compensation by pixel value of ABC Digital compensation electronic filters <p>4.8 FLUOROSCOPIC FUNCTION</p> <ul style="list-style-type: none"> • Fluoroscopic image processing • Dynamic recursive filter processing • Last image hold processing • Image vertical and lateral flip processing <p>4.9 Fluorography function Images should be recorded on the hard disk and should be processed and Displayed on the monitor.</p> <ul style="list-style-type: none"> • Digital single fluorography • Digital sequential fluorography • Sequence parameters to be preset. 	

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	<p>4.10 RADIOGRAPHIC IMAGE PROCESSING</p> <ul style="list-style-type: none"> • Gray-scale processing • Auto-window processing • Spatial filter processing (edge enhancement, smoothing) • Negative/positive reversal processing • Magnification processing. • Rotation • Image vertical and lateral flip processing <p>4.11 DISPLAY FUNCTIONS</p> <ul style="list-style-type: none"> • Multi frame display • Subdivided display • Auto display shutter • Graphics (letters, arrows, rectangles, ellipses) <p>4.12 FILMING</p> <ul style="list-style-type: none"> • Laser imager interface: DICOM print connection • Network communication • DICOM storage • DICOM print <p>4.13 DIGITAL RADIOGRAPHY SYSTEM</p> <ul style="list-style-type: none"> • TV camera <ul style="list-style-type: none"> – Image sensor: At least One-million-pixel CCD – Max. Frame rate: 30 fps, progressive scan – Number of bits: 14 bits depth • Image storage <ul style="list-style-type: none"> – Capacity of main hard disk 90,000 images or more – Capacity of mirror same as main hard disk <p>4.14 MONITOR</p> <ul style="list-style-type: none"> • LCD size: 20 inches or more • Color/monochrome: Color • Resolution: 1600 × 1200 • Laser Camera: Integrated DICOM interface supports printing from DICOM print modalities. • 2ND STATION FOR RADIOGRAPHY. <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With All other paraffin items like necessary printer. • Offer should be complete with installation, preparation of room, including distribution board ac and AC according your equipment’s requirements and five year warranty with service and including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts 	

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	<p>and without parts for 5 years (minimum) in term of %age for finally negotiated value.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
5.	<p>DEXA SCAN</p> <ul style="list-style-type: none"> ○ Whole Body DXA Bone Densitometer Including: <ul style="list-style-type: none"> a. 2D-Fan Beam with X and Y kinematics b. 200 or more detectors c. X-ray source d. Windows XP OR upper based software ○ Data management software ○ Archiving system ○ Hip, Spine and Forearm, Hip comparison, ○ Whole Body ○ Scan combination of Hip and Spine ○ Lateral Spine BMD ○ DVA ○ Orthopedic ○ Pediatrics ○ Dicom push and print, Work list, Workstation ○ FRAX tool ○ Morphometry <ul style="list-style-type: none"> a. Calibration phantom b. Positioning accessories c. Shipping crate ○ Including PC, Monitor, Printer& UPS. <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With All other peripheral items like necessary printer. • Offer should be complete with installation, preparation of room, including distribution board ac and A.C according your equipment's requirements and five year warranty with service and including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. 	1 No.

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6.	<p>ULTRASOUND COLOUR DOPPLER MACHINE FOR ECHOCARDIOGRAPHY</p> <p><u>GENERAL:</u></p> <ul style="list-style-type: none"> • High end heavy duty Digital Beam Former trolley mounted color Doppler Ultrasound system with cardiac functionality. <p><u>DISPLAY:</u></p> <ul style="list-style-type: none"> • High resolution 19 inches or more HD Resolution, wide angle visibility, Tilt able and swivel able LCD • 11 inches or more tablet like touch screen <p><u>OPERATING MODES:</u></p> <ul style="list-style-type: none"> • 2-D and M-modes, PW HPRF, CW, Color Doppler, Real Time Duplex mode, Real time Triplex Mode, Tissue Doppler, B-Flow/SMI, panoramic imaging and CRT programming protocols, system should have capability of sector matrix and single crystal probe. <p><u>CONTROL PANEL:</u></p> <ul style="list-style-type: none"> • Alphanumeric keyboard with built-in trackball. • Direct access to system function through dedicated keys. • Indicator lights identify activated keys. • Audio volume control. • User selectable image magnification control. • Adjustable transmit focusing control. • Digital TGC <p><u>FRAME RATE:</u></p> <ul style="list-style-type: none"> • Minimum 1400 frames per second (more are preferable) in 2-D mode and 500 frames per second (more are preferable) in Doppler mode. <p><u>MEASUREMENTS:</u></p> <ul style="list-style-type: none"> • Complete (Adult & Peads) cardiac calculations including Z scores available in system • Retrospective/Prospective saving of images and cine <p><u>CINE MEMORY:</u></p> <ul style="list-style-type: none"> • Minimum cine memory for 1000 frames (more are preferable). 	2 Nos.

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	<p><u>IMAGE VIEWING DEPTH:</u></p> <ul style="list-style-type: none"> • 20-300mm or more for cardiac applications. <p><u>PROBES:</u></p> <ul style="list-style-type: none"> • Multi frequency sector probes to minimum cover 3 to 5 MHz range for adult's echocardiography. • Multi frequency sector probes to minimum cover 4 to 8 MHz range for pediatrics echocardiography. • Multi Frequency Linear Vascular probe to minimum cover 3 to 9 MHz range (Optional) • Adult TEE Probe (Optional) • Ped TEE Probe (Optional) <p><u>IMAGING MODES / TECHNIQUES:</u></p> <ul style="list-style-type: none"> • Tissue harmonic imaging for cardiac and vascular imaging, • Tissue Doppler imaging, • Tool for calculating deformation and rate of deformation of the tissue, visualization of small vessels, velocity of myocardial segments, real time myocardial systolic displacement, wider field of view with phased array probe • Steerable M-Mode • System should be capable to set Stress Protocols • Customizable automation that help the user through each step of the scan • Tool for comprehensive reporting in system • Compatibility with adult and pediatric TEE Probe • Spectral Tracking • Auto EF • Stress strain imaging <p><u>STORAGE, INTERFACES AND EXTERNAL OUTPUT:</u></p> <ul style="list-style-type: none"> • Audio & Video out • Multiple USB ports • LAN connectivity. • System should possess different file format like MPEG, AVI, DICOM, JPEG for storage and export. • Built in DVD writer. • Built stand by battery with backup time of minimum 15 minutes for uninterrupted scanning of patients (UPS is separate) <p><u>ACCESSORIES:</u></p> <ul style="list-style-type: none"> • B&W Thermal Printer • On line (pure sine wave) UPS for minimum 25 minutes back up time for complete unit including for workstation <p><u>Mandatory Options:</u></p> <ul style="list-style-type: none"> • DICOM 3.0 Complete image storage, Print, Query, Retrieve, Data and Imaging flow, Network communication. 	

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	<p><u>INTERNATIONAL QUALITY AND SAFETY STANDARDS:</u></p> <ul style="list-style-type: none"> • ISO 9000 • FDA/CE <p><u>POWER MANAGEMENT:</u></p> <p>g) 220V, 50HZ.</p> <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With All other peripheral items like necessary printer. • Offer should be complete with installation, preparation of room, including distribution board ac and According equipment's requirements and five-year warranty including transducers. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • Units which is offered should be substantiated with the list of installation at different sites other than • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
7.	<p>DIGITAL HIGH END COLOR DOPPLER</p> <p>Color Doppler with more than 192 transmitting channels with 12 -Bit A/D Conversion Fully Digital Beam former having 2D / M -Mode and Doppler Facilities, (PW, HPRF, & Color Flow Imaging) with High Resolution Imaging Doppler Signal Quality; having DICOM Compatibility and Upgradeable to CW and 4D Imaging in Convex, Linear and Endocavity Probe.</p> <ol style="list-style-type: none"> 1. B-MODE Specification: <ol style="list-style-type: none"> a) Sector Scan Angle Variable in Four Steps. b) Viewing Depth: 30 cm Minimum (Both in B & W and Color). c) Frame Rate: 1000 f/sec or more d) Built-in cine loop with ability to vary reverse and slow motion of display; Internal Memory 2000 or more Color Images or more/ Equivalent. e) Real time and Freeze Image Magnification at least 10X or more with panning for Real, Freeze and Memorized Images. 2. M-mode specification: <ol style="list-style-type: none"> a) Magnification: X2 or more. b) Sweep Speed: Slow, Medium and Fast. 	11 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>c) Color Display of M -Mode.</p> <p>3. D-mode specification:</p> <ol style="list-style-type: none"> a) Pulse -Wave Doppler Measureable Velocity Range. b) HPRF Doppler. c) CONTINUOUS -WAVE DOPPLER: d) Measurable Velocity Range: Steerable. e) Must have Doppler Beam Steering and Bi -Directional Stereo -Audio. f) Colorized Spectrum Display. g) Automatic Baseline and Velocity Range Control. h) Live Measurements for Doppler Spectrum. i) Min. detectable velocity range 0.05 /cm or less for low flow velocity blood vessels. <p>4. Color Doppler mode specifications:</p> <ol style="list-style-type: none"> a) Both CW and PW Doppler must be Continuous Steerable in the Color Blood Flow Image Mode in Real Time. b) 2D Image with Color, CW and PW Doppler. c) Windows based System for easy usage with Programmable Control Panel Keys. d) Tissue Harmonic Imaging with 4THI or more Frequency. e) Power Doppler. f) -Triplex Mode for Simultaneous Display of Color B/M and D-Mode Displays. g) 200 db system dynamic range or more. <p>5. Measurement package: To provide Comprehensive Software Package for Measurement of Distance, Circumference, Area, Time Depth, ANGLE, IMT, Velocity, Frequency, Heart Rate, Volumes, Nuchal Thickness/ Measurement Software to be Provided as a Standard.</p> <p>6. System complete e with following facilities and accessories:</p> <ul style="list-style-type: none"> - 19-Inches Minimum TFT / LED Color Monitor, with Resolution 1280 x1024 Pixels minimum. - Foot-Switch. - 4 Active Transducer Connector for Tran thoracic Probes DVD / CD Drive for Image Storage to be Built -in to the System. - 500 GB or more Hard Disk Drive to be Built-in to the System. - Built-in DICOM Compatibility. (3.0 with all components) - Touch Command Screen Control at least 10 -inches LCD / TFT. - Full DICOM (Upgradable) <p>7. Upgradeability:</p> <ul style="list-style-type: none"> - System Software must be Upgradable. <p>8. Standard probes:</p> <ul style="list-style-type: none"> - 2–6 MHz Multi -Frequency Single Crystal Convex Probe for B/M/CDI/PW. (<i>Prices must be quoted separately</i>) - 5-9 MHz Multi -Frequency Linear Probe. (<i>Prices must be quoted separately</i>) - TVS / ENDOCAVITORY Color PROBE (<i>Prices must be quoted separately</i>) - 7-14 MHz Multi -Frequency Linear Probe for B/M/CDI/PW(OPTION) (<i>Prices must</i> 	

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p><i>be quoted separately)</i></p> <ul style="list-style-type: none"> - 2–6 MHz Multi -Frequency Single Crystal Convex Probe for B/M/CDI/PW and Shearwave Elastography. (<i>Prices must be quoted separately)</i> - 5-9 MHz Multi -Frequency Linear Probe with Shearwave Elastography. (<i>Prices must be quoted separately)</i> <p>NOTE: Probes should be of same Country of Manufacturer & Origin as main unit</p> <p>9. Standard recording devices:</p> <ul style="list-style-type: none"> - Thermal Paper Printer with fifty Rolls of Paper (Black & White) with HD - CINEWAVE UPS Online with 30 minutes back up time for the System. - IMPORTED <p>10. Tissue Doppler Imaging Mode.</p> <p>11. Pure Wave / Pulse Inversion / Differential Tissue Harmonic Imaging to Enhance Effective Wide Band Frequency Range to provide Simultaneously Spatial Resolution, Contrast Resolution and increased Penetration using Two Transmission Pulses at Different Frequencies Simultaneously and Reception at Harmonic as well as Differential Component.</p> <p>12. Auto Image Optimization / Quick Scan Imaging for Automatic STC / GAIN and Doppler Spectrum Adjustment with Optimal Image Quality by using One Touch Operation.</p> <p>13. B -Flow / Dynamic Flow Imaging / E -Flow.</p> <p>14. Trapezoid Imaging / Virtual Convex Imaging with Linear Probe .</p> <p>15. Compound / Aplipure Imaging for THI/both Frequency Compounding and Spatial Compounding in B/W and Color Mode.</p> <p>16. Panoramic / SIESCAPE / Logic view Imaging with Measurements.</p> <p>17. TISSUE CONTRAST ENHANCEMENT SOFTWARE/SPECTRAL REDUCTION</p> <p>18. N-Sight / Adaptive Suppression / Precision Imaging /Cross beam to Enhance B -Mode Imaging, Xress/Ccare/or equivalent Detailed in Layers and Boundaries and Sharpened Outlines of the Lesions and reduce Cluttering.</p> <p>19. Micro CPA / Superb Micro Imaging/vascular enhancement Color/spectral to Clearly Show Blood Flow in tiny Vessels,</p> <p>20. Shear wave Elastography with Quantification for body Organs specially. (Prices must be quoted separately)</p> <p>21. Liver with Convex & Linear Probes to visualize Tissue Stiffness by Generating Images through Shear Wave Propagation.</p> <p>22. Live Strain Rate Elastography with Quantification for Body Organs Specially Breast to Visualize Lesions. (Prices must be quoted separately)</p> <p>23. Contrast Harmonic Imaging Upgradable.</p> <p>24. Fusion Imaging of CT / MRI 3D Volume DATA to Synchronize with Ultrasound Imaging. Complete with Hardware /NEEDLE NAVIGATION WITH TRACKING SYSTEM & Software Upgradable.—OPTION (Prices must be quoted separately)</p> <p>25. MSK Software (<i>price must be quoted separately)</i></p> <p>26. Voltage : 220V – 240V, 50 – 60 HZ</p> <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. 	

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	<ul style="list-style-type: none"> • With All other peripheral items like necessary printer. • Offer should be complete with installation, preparation of room, including distribution board ac and AC according to equipment's requirements and five year warranty with service and including probes • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p>NOTE:</p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. 	
8.	<p>DIGITAL MEDIUM RANGE COLOR DOPPLER</p> <p>Color Doppler with more than 192 transmitting channels with 12 -Bit A/D Conversion Fully Digital Beam former having 2D / M -Mode and Doppler Facilities, (PW, HPRF, & Color Flow Imaging) with High Resolution Imaging Doppler Signal Quality; having DICOM Compatibility and Upgradeable to CW and 4D Imaging in Convex, Linear and Endocavity Probe.</p> <p>1) B-MODE Specification:</p> <ol style="list-style-type: none"> a) Sector Scan Angle Variable in Four Steps. b) Viewing Depth: 30 cm Minimum (Both in B & W and Color). c) Frame Rate: 1000 f/sec or more d) Built-in cine loop with ability to vary reverse and slow motion of display; Internal Memory 2000 or more Color Images or more/ Equivalent. e) Real time and Freeze Image Magnification at least 10X or more with panning for Real, Freeze and Memorized Images. <p>2) M-MODE SPECIFICATION:</p> <ol style="list-style-type: none"> a) Magnification: X2 or more. b) Sweep Speed: Slow, Medium and Fast. c) Color Display of M -Mode. <p>3) D-MODE SPECIFICATION:</p> <ol style="list-style-type: none"> a) Pulse -Wave Doppler Measureable Velocity Range. b) HPRF Doppler. c) CONTINUOUS -WAVE DOPPLER: <ul style="list-style-type: none"> - Measurable Velocity Range: Steerable. - Must have Doppler Beam Steering and Bi -Directional Stereo -Audio. d) Colorized Spectrum Display. e) Automatic Baseline and Velocity Range Control. 	3 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>f) Live Measurements for Doppler Spectrum. g) Min. detectable velocity range 0.05/cm or less for low flow velocity blood vessels.</p> <p>4) COLOR DOPPLER MODE SPECIFICATIONS</p> <ul style="list-style-type: none"> • Both CW and PW Doppler must be Continuous Steerable in the Color Blood Flow Image Mode in Real Time. • 2D Image with Color, CW and PW Doppler. • Windows based System for easy usage with Programmable Control Panel Keys. • Tissue Harmonic imaging with 4 THI or more Frequency. • Power Doppler. • Triplex Mode for Simultaneous Display of Color B/M and D-Mode Displays. • 200 db system dynamic range or more. <p>5) MEASUREMENT PACKAGE: To provide Comprehensive Software Package for Measurement of Distance, Circumference, Area, Time Depth, ANGLE, IMT, Velocity, Frequency, Heart Rate, Volumes, Nuchal Thickness/ Measurement Software to be Provided as a Standard.</p> <p>6) SYSTEM COMPLETE WITH FOLLOWING FACILITIES AND ACCESSORIES:</p> <ul style="list-style-type: none"> • 19-Inches Minimum TFT / LED Color Monitor, with Resolution 1280 x1024 Pixels minimum. • Foot-Switch. • 3 Active Transducer Connector for Tran thoracic Probes DVD / CD Drive for Image Storage to be Built -in to the System. • 500 GB or more Hard Disk Drive to be Built-in to the System. • Built-in D ICOM Compatibility. (3.0 with all components) • Touch Command Screen Control at least 10 -inches LCD / TFT. • Full DICOM (Upgradable) <p>7) UPGRADEABILITY - System Software must be Upgradable.</p> <p>8) STANDARD PROBES:</p> <ul style="list-style-type: none"> - 2–6 MHz Multi -Frequency Single Crystal Convex Probe for B/M/CDI/PW. - 5-9 MHz Multi -Frequency Linear Probe for vascular studies. - TVS/ENDOCAVITORY Color PROBE - 7-14 MHz Multi -Frequency Linear Probe for B/M/CDI/PW <p>NOTE: Probes should be of same Country of Manufacturer & Origin as main unit</p> <p>9) STANDARD RECORDING DEVICES:</p> <ul style="list-style-type: none"> - Thermal Paper Printer with fifty Rolls of Paper (Black & White). WITH HD - CINEWAVE UPS Online with 30 minutes back up time for the System. 	

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	<p>10) Tissue Harmonic imaging without contrast with 4 harmonic frequencies. 11) Pure Wave / Pulse Inversion / Differential Tissue Harmonic Imaging or similar. 12) Auto Image Optimization / Quick Scan Imaging for Automatic STC / GAIN and Doppler Spectrum Adjustment with Optimal Image Quality by using One Touch Operation. 13) B-Flow / Dynamic Flow Imaging / E -Flow clarify for low flow vessels imaging. 14) Trapezoid Imaging / Virtual Convex Imaging with Linear Probe. 15) Compound / Aplipure Imaging for THI/both Frequency Compounding and Spatial Compounding in B/W and Color Mode. 16) Panoramic / SIESCAPE / Logic view Imaging with Measurements. 17) Voltage: 220V – 240V, 50 – 60 HZ</p> <p>SYSTEM MUST HAVE FDA AND CE.</p> <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With All other Peripheral items like printer. • Offer should be complete with installation, preparation of room, including distribution board AC and chiller according to equipment requirements. • Five year warranty with service. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • Units which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. 	
9.	<p>STATIC X -RAY MACHINE WITH DR SYSTEM</p> <p>9.1 Microprocessor based. 9.2 High frequency, 50KW X -Ray generator. 9.3 1000 mA a/ 150 kv 9.4 Anatomical programmed radiography. 9.5 Digital display of all set parameters. 9.6 Rotating anode x -ray tube, with dual focus 0.6 & 1.2 mm. Anode heat storage capacity of at least 300 KHU or more electronic timer with exposure time of 1 msec. 9.7 System with AEC facility. 9.8 Ceiling mounted with three directional movement 9.9 Capable of lateral radiography. 9.10 6-way floating table</p>	4 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>9.11 Chest Stand with Bucky's complete with grid 12.1 ratio.</p> <p>9.12 Automatic over -load protection device and automatic line compensation.</p> <p>9.13 3 Phase 380V 50Hz</p> <p>9.14 DIGITAL RADIOGRAPHY SYSTEM</p> <p>Detector</p> <p>a) Digital Flat Panel Detector, scintillator & amorphous silicon glass.</p> <p>b) Scintillator Csi</p> <p>c) Pixel size (µm) 125 x 125 µm or better</p> <p>d) Matrix 2800 x 3408 or better</p> <p>e) Analog to Digital 14 bits.</p> <p>f) Grey scale 4096 grey scale.</p> <p>g) Electric Shock proof.</p> <p>h) Size 35cmx43cm (14 inch x 17 inch).</p> <p>i) Detector weight 3.1 Kg.</p> <p>9.15 Operator Console / Main Console</p> <p>a) Workstation Console.</p> <p>b) 21 inch Medical Grade monitor.</p> <p>c) Key board.</p> <p>d) Image preview within 3 to 5 Seconds.</p> <p>e) Processor 3GHz.</p> <p>f) RAM 2GB.</p> <p>g) HDD for Data storage 1 TB</p> <p>h) The system is capable of entering patient ID through Hospital management System (HMS / Radiology Information System (RIS)).</p> <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With all other Peripheral items like printer, one viewing work station, one Work station complete with post processing capability and connectivity with the existing network. • Offer should be complete with installation, preparation of room including light, distribution board AC and air-conditioning for the equipment. • Five year warranty with service, including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	

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10.	<p>STATIC X -RAY MACHINE WITH CR SYSTEM</p> <ul style="list-style-type: none"> • Microprocessor based. • High frequency, 80 KW X -Ray generator. • 1000 mA a/ 80 kv • Anatomical programmed radiography. • Digital display of all set parameters. • Rotating anode x -ray tube, with dual focus 0.6 & 1.2 mm. Anode heat storage capacity of at least 300 KHU or more electronic timer with exposure time of 1 msec. • System with AEC facility. • Ceiling mounted with three directional movement • Capable of lateral radiography. • 6-way floating table • Chest Stand with Bucky's complete with grid 12.1 ratio. • Automatic over -load protection device and automatic line compensation. • 3 Phase 380V 50Hz <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With all other Peripheral items like printer, one viewing work station, one Work station complete with post processing capability and connectivity with the existing network. • Offer should be complete with installation, preparation of room including light, distribution board AC and air-conditioning for the equipment. • Five year warranty with service, including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • A unit which is offered should be substantiated with the list of installation at different sites including Pakistan. • The equipment technology offered should not be more than 3 years old. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	1 No.
11.	<p>MOBILE X-RAY UNIT</p> <p>Mobile Microprocessor based X -Ray Unit. High frequency, 30KW X -Ray Generator. 300 mA at 100 kv Digital display of all set parameters. Rotating anode x -ray tube, with dual focus / Single Focus</p>	2 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>Anode heat storage capacity of at least 107 KHU or more Electronic timer with exposure time of 1 -3 msec. Automatic over -load protection device and automatic line compensation. The unit should be battery supported for exposure 220 V, 50 Hz.</p> <p><u>Offer should be complete with following.</u></p> <ul style="list-style-type: none"> • UPS with complete unit for 10 min. • With All other paraffin items like necessary printer. • Five year warranty with service including tube and detector with unlimited exposures. • The bidder shall separately quote the price of post warranty service contract with parts and without parts for 5 years (minimum) in term of %age for finally negotiated value. <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • All latest applications should be quoted as optional with separate prices. • Application training in house two weeks by the application specialist at site. • The equipment technology offered should not be more than 3 years old. • A unit which is offered should be substantiated with the list of installation at different sites other than Pakistan. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
12.	<p>PRINTER</p> <p>DICOM 3.0 compliant Gray scale Dry LASER Printer with 3 online sizes.</p> <p>Should have minimum productivity of 150 films/ hour in mixed sizes. Printer should be capable of printing 08x10, 10x12, 11x14, 14x14 & 14x17 size films.</p> <p>Minimum resolution should be 10 pixels/mm with 12 -bit gradation.</p> <p>80 Sheets Per Hour.</p> <p>Printers should connect with mammography and compatible with mammography printing.</p> <p>Warranty: 5 year warranty with parts and accessories.</p> <p><u>NOTE:</u></p> <ul style="list-style-type: none"> • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	6 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
13.	<p>CR SYSTEMS</p> <p>Reading gray scale “12 Bits” Warranty: 5 year warranty with parts and accessories.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	6 Nos.
14.	<p>DOSIMETER Prime Quality</p>	8 Nos.
15.	<p>TLD BADGES Prime Quality</p>	80 Nos.
16.	<p>CASSETTES WITH IPS SIZE 14 X 17 Prime Quality</p>	30 Nos.
17.	<p>CASSETTES WITH IPS SIZE 10 X 12 Prime Quality</p>	20 Nos.
18.	<p>CASSETTES FOR MAMMO WITH IPS SIZE 08 X 10 Prime Quality</p>	10 Nos.
19.	<p>CASSETTES WITH IPS SIZE 10 X 12 Prime Quality</p>	10 Nos.
20	<p>LEAD APRON WITH THYROID SHIELDING Prime Quality</p> <p>Large Size: 4 Nos. Medium Size: 8 Nos. Small Size: 7 Nos.</p>	1 Set