



CORRIGENDUM

**PROCUREMENT OF RADIOLOGY EQUIPMENT /
INSTRUMENTS AND ANCILLARIES FOR
ESTABLISHMENT OF TRAUMA CENTER, BSL-3 LAB AND
PROVISION OF SUPPORT SERVICES**

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

G: Corrected / Modified Technical Specifications

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
1.	<p>WHOLE BODY MULTI-SLICE (128-SLICES) or Plus COMPUTERIZED TOMOGRAPHY SCANNER</p> <p>1.1 GENERAL Latest Generation Whole Body CT Scanning machine for general purpose, multi-slice technology of 128 –Slice or plus per rotation with helical/spiral scanning capabilities.</p> <p>1.2 GANTRY</p> <ol style="list-style-type: none"> a. System should be capable of Acquiring /Generating 128 slice or plus per gantry rotation in real time. b. Gantry bore / aperture to be at least 70 cm or more. c. Minimum gantry rotation time to be at least 0.35 seconds or better, for 128 slices per 360 degree rotation, for all applications. d. All the firms should quote their latest model scanner with shortest rotation time Breath holding time 05 sec or less in cardiac scan. e. System should be able to acquire helical and sequential scan in one rotation. f. Gantry tilt range must be + 30 degree. g. Maximum scan field of view to be at least 50 cm. h. For Paeds & Children the system should be able to reduce the field of view to 250 mm. i. Minimum slice thickness 0.625 mm or better in Helical mode. j. Dual Control (including tilt,) of gantry and table from the gantry -housing and console. <p>1.3 TUBE</p> <ol style="list-style-type: none"> a. Heat storage capacity of at least 7 MHU or better. Generator output of up to 600 mA or more. b. Active collimation during scanning <p>1.4 GENERATOR</p> <ol style="list-style-type: none"> a. High frequency power generator with minimum power of at least 70 KW or more should be capable of variable kV setting in steps from 80 to 135/140 KVP b. Should have ability to vary the power (mAs) automatically in steps Real -time dose reduction hardware / software and with ECG modulation Iterative dose reduction must be offered. c. Low contrast delectability (LCD) calculated on a CATPHAN 20 cm, of 5 mm resolution with a CT No. of 3HD (0.3%) or better, contrast difference d. Scan Length of at least 1.8 meters or more of helical or axial scan in a single acquisition. e. Maximum Scan Time 100sec. or better. <p>1.5 DETECTORS</p> <ol style="list-style-type: none"> a. Solid state crystal / ceramic detectors with conversion efficiency (x-ray to signal strength) of nearly 98% latest technology. Isotropic voxel size of 0.35 mm or better, in all three axis 	1 No.

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	<p>b. Minimum 64 Detectors and detector electronics capable of providing 128 slices per gantry rotation</p> <p>c. Detectors width 38 mm or more.</p> <p>1.6 COUCH</p> <p>a. Dual motorized control (from console and gantry) of table movements in horizontal and vertical axis.</p> <p>b. Maximum weight allowed on the couch up to 200 kg or more Horizontal movement speed up to 100 mm per second.</p> <p>c. Single acquisition scan range of at least 1.8 meter</p> <p>d. Scan with at least 0.25 mm accuracy / reproducibility on a 200 kg patient. Lateral moment table</p> <p>1.7 CONSOLE COMPUTER</p> <p>a. System architecture and operating system must be based on latest technology (64 bit RISC or Dual Xenon Processor PC) original.</p> <p>b. Multitasking and parallel processing CPU system. At least 8 GB RAM or more</p> <p>c. Hard disc capacity for image storage of at least 500 GB or more.</p> <p>d. Capable of storing at least 3000 raw data files / rotations or 700 GB raw data / 450000 images in 512 x 512 format</p> <p>e. Reconstruction of at least 25 images FRAMES per seconds or better at 512 x 512 matrix.</p> <p>f. Image area display matrix dimensions (1024 x 1024)</p> <p>g. Console color monitor (X 02), LCD of at least 19 inches, medical grade with maximum viewing angle</p> <p>1.8 DVD and CD writer CONSOLE SOFT WARE</p> <p>All the latest whole body & cardio -vascular software should be supplied as standard which is available at the time of shipment original with their part No of company.</p> <p>1.9 USER INTERFACE SOFTWARE</p> <p>a. True isotropic volume acquisition</p> <p>b. Axial and helical cardiac scanning</p> <p>c. Variable Delay algorithm like fixed percent delay (FPD) and fixed offset delay (FOD) orbetter, for selection of period of least motion in cardiaccycle (temporalresolution of 44 milli second or less will be preferred)</p> <p>d. Automated contrast media bolus tracking software.</p> <p>1.10 3D RECONSTRUCTION DISPLAY ORIGINAL COMPANY SOFTWARE.</p> <p>a. Maximum and minimum intensity projections</p> <p>b. Multiplayer and curved planer reconstruction</p> <p>c. 3D shaded surface display</p> <p>d. 3D volume rendering software</p> <p>e. 3D virtual endoscopy, colonoscopy and bronchoscopy</p> <p>f. 3D cone beam correction. CT angiography</p> <p>Basic Comprehensive Brain perfusion analysis</p> <p>Image reconstruction Automatic real time dose adjustment according to the body attenuation i.e. core 4D dose/longitudinal dock workstation/ 4D boost/ sure exposure</p>	

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	<p>3D/ organ specific dose modulation or similar.</p> <ul style="list-style-type: none"> a) Artifact reduction algorithm b) Automatic control of tube current over high and low attenuation areas for patient dose reduction software for low dose to patient original / certified. c) ITERATIVE DOSE REDUCTION SOFTWARE. d) Bone removal software. e) Metal artifact reduction software f) Fat index software <p>1.11 Dental CT Optional Dual energy to be separately quoted WORK -STATION - 03 in number/ thin client server (work station with 03license users) Independent, automatic multimodality, fully functional. All companies should supply the same manufacturer's work -stations that they provide world -wide as a standard. Work -stations will be from manufacturer of CT to ensure similar work flow. Third party work –stations is not acceptable accepted. High speed link to operator console on DICOM network System architecture and operating system</p> <ul style="list-style-type: none"> a. Dual processor Xeon b. 2.66 GHz or more speed c. 512 cache or more d. Graphic cord and network cord <p>1.12 Original Licensed software: Window XP/7/8 or Linux, MS Office 2013,</p> <p>1.13 Norton/ equivalent antivirus (current and upgradeable for at least for the time of warranty) Should have at least one high resolution LCD monitor (medical grade as recommended by the manufacturer) of 18 inch or more</p> <p>1.14 DVD RW (super -drive will be preferred)</p> <p>1.15 DICOM -3 viewer with universal PC display capability (licensed)</p> <p>1.16 WORKSTATION SOFTWARE (original with certificate) with thin client, server with three concurrent users).</p> <ul style="list-style-type: none"> a. All the latest available cardiac and whole body software will be provided by the vendor as standard, including reporting packages. b. Software up -gradation of all existing applications for at least next 05 years will be provided free of cost. c. Following software will be provided at the workstation of the same origin as are being used in USA/EUROPE & JAPAN. 3D <p>1.17 Reconstruction display.</p> <ul style="list-style-type: none"> a. Maximum and minimum intensity projections b. Multiplaner and curved planer reconstruction c. 3D shaded surface display. d. 3D volume rendering software e. 3D virtual endoscopy, colonoscopy with lumen / fillet view /electronic cleansing / auto segmentation of the colon and bronchoscopy 	

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	<p>1.18 CT Angiography</p> <ul style="list-style-type: none"> a. Advanced coronary vessel analysis with Auto Labeling /center line b. Analysis Plaque Analysis /Valve Analysis. c. Calcium scoring with ECG / VCG gating and prospective / retrospective reconstruction d. Advanced complete cardiac package including functional analysis with automatic bone removal software. e. Comprehensive Cardiac Analysis Application Including single click cardiac segmentation. f. Peripheral / general vessels analysis g. Lung nodule detection and analysis Brain perfusion analysis h. Latest dedicated software for liver imaging with auto segmentation in single click etc. <p>1.19 Fluoroscope</p> <ul style="list-style-type: none"> a. Fluoroscopy with real time imaging and display of at least 8 frames/sec with required hardware & software. One high resolution in -room TFT monitor of at least 15 inches or more on mobile base/ceiling mounted. b. All the firms should provide the life time registered software with part number & products keys / password of all above CT software's original along with c. CDs and backup for installation. d. UPS 3 KVA (x 03), Branded, dry battery capable of providing 20 minutes of back-up for workstations (MG, APC, MC, Chloride, Riello, Emerson). The dry batteries will be included in company warranty. e. Heavy duty Laser black and white printer (qty: 3) A4 /letter size 2400 dpi or higher, two paper trays for A4/ letter size media, (HP, Lexmark, Xerox, CANNON) network -ready DICOM f. DICOM 3 ready (multi -vendor and multimodality compatible for send, receive, achieve, retrieve and print, on main console and workstations). UPGRADE - ABILITY g. All vendors will quote their latest and best system. h. The system should have a software upgrade route to higher versions with undertaking of above two by the principal manufacture, that is their latest version been used in USA/EU & Japan. <p>1.20 POWER REQUIREMENT Three phase with line voltage of 380 -440V, 50Hz.</p> <p>1.21 ACCESSORIES</p> <ul style="list-style-type: none"> a. 13.1 Programmable, dual head power injector with flow/volume and temperature control. Mounted on mobile base, with 500 syringes of 150 ml capacity and connecting tubes (Medrad, Medtron/Mallen, Nemoto) - b. DICOM 3 ready dry laser camera / imager, Multi -size up to 14 x1 7 in. (Agfa, Fuji, Kodak/Carestream, Konica) for black and white printing on films including 5000 films. c. LED FILM VIEWER (x 08) for images up to 14 x 17 inch with variable light control and shutters for control of viewing area, with 04 x 1 format MEDICANVAS, MAVIA d. On-line sine wave UPS for whole CT suite, with a minimum back -up time of 	

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	<p>30 minute on full load, including air -conditioning system,</p> <p>e. Two split Air conditioners</p> <p>f. Two Ton each for UPS room office and waiting area lights/fans etc.,</p> <p>g. Protection devices: Lead aprons (06) with hangers, Lead-gloves (06 pairs), Lead goggles(03) Thyroid Shields (03) all 0.5 mm lead equivalent European & Japanese.</p> <p>h. Lead glass for control room (5 x 3 feet), 2 mm lead equivalent.</p> <p>i. Standard set of Phantoms for calibration of CT Pediatric scanning package - software and hardware original.</p> <p>j. Cardiac defibrillator,</p> <p>k. Dedicated Cardiac Monitor for synchronize with cardiac scan.</p> <p>l. Pulse oximeter</p> <p>m. ECG machine, multichannel (three channel)</p> <p>n. Cardiac Resuscitation trolley completely equipped with all necessary items</p> <p>1.22 TABLE ACCESSORIES</p> <p>Table pads , arms rest, patient restraint kit, IV pole, infant cradle, flat head holder, ceiling mounted hand holder patient (original accessories from the vendor)</p> <p>Digital Transcription system for reporting (hand held units– x 03, and Complete steno -type desktop s unit (x 02)</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. • C.T Injector • Offer should be complete with installation, preparation of room including light, distribution board AC and air-conditioning for the equipment. • Chiller according to equipment requirements. • 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. • 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. <p>Country of Origin: USA / Japan / Europe</p>	

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2.	<p data-bbox="177 237 1182 271">DIGITAL X-RAY FLUOROSCOPY UNIT FOR CONTRAST STUDIES</p> <p data-bbox="177 309 608 342">4.1 X-RAY GENERATOR:</p> <ul data-bbox="277 349 1262 656" 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 data-bbox="177 694 496 728">4.2 X -RAY TUBE:</p> <ul data-bbox="277 734 1362 840" 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. <p data-bbox="177 878 927 911">4.3 AUTOMATIC X RAY BEAM COLLIMATOR</p> <p data-bbox="177 949 1002 983">4.4 IMAGE INTENSIFIER / MONITORING SYSTEM:</p> <ul data-bbox="277 990 1366 1296" 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 data-bbox="177 1301 1318 1373">4.5. REMOTE CONTROL TABLE WITH TOMOGRAPHY AND SPOT FILM IMAGING DEVICE:</p> <ul data-bbox="277 1379 1366 1644" 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 data-bbox="177 1682 496 1715">4.6. IMAGE INPUT</p> <ul data-bbox="277 1722 1182 1827" 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 data-bbox="177 1865 552 1899">4.7 IMAGE STORAGE</p> <ul data-bbox="277 1906 1366 2018" 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 	1 No.

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	<p style="text-align: center;">standard) Sub-display with main diagnostic display Suitable fluoroscopic image: New AEC; Auto-compensation by pixel value of ABC Digital compensation electronic filters</p> <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. <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 	

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	<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 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. • 4 to 6 week training of doctor at any English speaking country hospital where the offered equipment is installed. • 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. <p>Country of Origin: USA / Japan / Europe</p>	
3.	<p>DIGITAL HIGH END COLOR DOPPLER WITH ECHOCARDIOGRAPHY</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 End cavity and phased array Sector Probe for echo cardiograph.</p> <p>3.1) 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>3.2) M-MODE SPECIFICATION</p> <ol style="list-style-type: none"> a. Magnification: X2 or more. 	1 No.

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	<p>b. Sweep Speed: Slow, Medium and Fast.</p> <p>c. Color Display of M -Mode.</p> <p>3.3) D-MODE SPECIFICATION</p> <p>a. Pulse -Wave Doppler Measureable Velocity Range.</p> <p>b. HPRF Doppler.</p> <p>c. CONTINUOUS -WAVE DOPPLER Measurable Velocity Range: Steerable. Must have Doppler Beam Steering and Bi -Directional Stereo -Audio.</p> <p>d. Colorized Spectrum Display.</p> <p>e. Automatic Baseline and Velocity Range Control.</p> <p>f. Live Measurements for Doppler Spectrum.</p> <p>g. Min. detectable velocity range 0.05 /cm or less for low flow velocity blood vessels.</p> <p>3.4) COLOR DOPPLER MODE SPECIFICATIONS</p> <p>a. Both CW and PW Doppler must be Continuous Steerable in the Color Blood Flow Image Mode in Real Time.</p> <p>b. 2D Image with Color, CW and PW Doppler.</p> <p>c. Windows based System for easy usage with Programmable Control Panel Keys.</p> <p>d. Tissue Harmonic Imaging with 4THI or more Frequency.</p> <p>e. Power Doppler.</p> <p>f. -Triplex Mode for Simultaneous Display of Color B/M and D - Mode Displays.</p> <p>g. 200 db system dynamic range or more.</p> <p>3.5) MEASUREMENT T 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>3.6) SYSTEM COMPLETE WITH FOLLOWING FACILITIES AND ACCESSORIES</p> <ul style="list-style-type: none"> - 19-Inches Minimum TFT / LED Color Monitor, with Resolution 1280 x 1024 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>3.7) UPGRADEABILITY</p> <ul style="list-style-type: none"> - System Software must be Upgradable. <p>3.8) STANDARD PROBES</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>) - 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 be quoted separately</i>) <p>NOTE: Probes should be of same Country of Manufacturer & Origin as main unit</p>	

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	<p>3.9) 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 (EUROPE/USA/JAPAN) <p>3.10) Tissue Doppler Imaging Mode.</p> <p>3.11) 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>3.12) 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>3.13) B -Flow / Dynamic Flow Imaging / E -Flow.</p> <p>3.14) Trapezoid Imaging / Virtual Convex Imaging with Linear Probe .</p> <p>3.15) Compound / Aplipure Imaging for THI/both Frequency Compounding and Spatial Compounding in B/W and Color Mode.</p> <p>3.16) Panoramic / SIESCAPE / Logic view Imaging with Measurements.</p> <p>3.17) TISSUE CONTRAST ENHANCEMENT SOFTWARE/SPECTRAL REDUCTION</p> <p>3.18) 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>3.19) Micro CPA / Superb Micro Imaging/vascular enhancement Color/spectral to Clearly Show Blood Flow in tiny Vessels,</p> <p>3.20) Shear wave Elastography with Quantification for body Organs specially Liver with Convex & Linear Probes to visualize Tissue Stiffness by Generating Images through Shear Wave Propagation. (Prices must be quoted separately)</p> <p>3.21) Live Strain Rate Elastography with Quantification for Body Organs Specially Breast to Visualize Lesions. (Prices must be quoted separately)</p> <p>3.22) Contrast Harmonic Imaging Upgradable.</p> <p>3.23) 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>3.24) 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. • With All other Peripheral items like printer. • Offer should be complete with installation, preparation of room, including distribution board AC 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. 	

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	<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. • 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. 	
4.	<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 CWand 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 - 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. f) Live Measurements for Doppler Spectrum. g) Min. detectable velocity range 0.05/cm or less for low flow velocity bloodvessels. <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 ColorBlood 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 4 THI or more Frequency. 	2 Nos.

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	<p>e. Power Doppler.</p> <p>f. Triplex Mode for Simultaneous Display of Color B/M and D-Mode Displays.</p> <p>g. 200 db system dynamic range or more.</p> <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> <p>a. 19-Inches Minimum TFT / LED Color Monitor, with Resolution 1280 x1024 Pixels minimum.</p> <p>b. Foot-Switch.</p> <p>c. 3 Active Transducer Connector for Tran thoracic Probes DVD / CD Drive for Image Storage to be Built -in to the System.</p> <p>d. 500 GB or more Hard Disk Drive to be Built-in to the System.</p> <p>e. Built-in DICOM Compatibility. (3.0 with all components)</p> <p>f. Touch Command Screen Control at least 10 -inches LCD / TFT.</p> <p>g. Full DICOM (Upgradable)</p> <p>7) UPGRADEABILITY - System Software must be Upgradable.</p> <p>8) STANDARD PROBES</p> <p>a. 2–6 MHz Multi -Frequency Single Crystal Convex Probe for B/M/CDI/PW.</p> <p>b. 5-9 MHz Multi -Frequency Linear Probe for vascular studies.</p> <p>c. TVS/ENDOCAVITORY Color PROBE</p> <p>d. 7-14 MHz Multi -Frequency Linear Probe for B/M/CDI/PW</p> <p>NOTE: Probes should be of same Country of Manufacturer & Origin as main unit</p> <p>9) STANDARD RECORDING DEVICES</p> <p>a. Thermal Paper Printer with fifty Rolls of Paper (Black & White). WITH HD</p> <p>b. CINEWAVE UPS Online with 30 minutes back up time for the System.</p> <p>10) Tissue Harmonic imaging without contrast with 4 harmonic frequencies.</p> <p>11) Pure Wave / Pulse Inversion / Differential Tissue Harmonic Imaging or similar.</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>	

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	<p>13) B-Flow / Dynamic Flow Imaging / E -Flow clarify for low flow vessels imaging.</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) Voltage: 220V – 240V, 50 – 60 HZ 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 / latest certified. • Clearly mention country of origin of company and country of manufacturing of offering equipment. 	
5.	<p>STATIC X -RAY MACHINE WITH DR SYSTEM</p> <ul style="list-style-type: none"> • Microprocessor based. • High frequency, 50KW X -Ray generator. • 1000 mA a/ 150 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 	1 No.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>DIGITAL RADIOGRAPHY SYSTEM</p> <p>Detector</p> <p>a) Digital Flat Panel Detector, scintillator & amorphous silicon glass. b) Scintillator Csi c) Pixel size (µm) 125 x 125 µm or better d) Matrix 2800 x 3408 or better e) Analog to Digital 14 bits. f) Grey scale 4096 grey scale. g) Electric Shock proof. h) Size 43cmx43cm (17 inch x 17 inch). i) Detector weight 3.1 Kg.</p> <p>Operator Console / Main Console</p> <p>a) Workstation Console. b) 21 inch Medical Grade monitor. c) Key board. d) Image preview within 3 to 5 Seconds. e) Processor 3GHz. f) RAM 2GB. g) HDD for Data storage 1 TB 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. • 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. <p>Country of Origin: USA / Japan / Europe</p>	

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6.	<p>STATIC X -RAY MACHINE WITH CR SYSTEM</p> <ul style="list-style-type: none"> • Microprocessor based. • High frequency, 80KW 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. • 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 / latest certified. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	1 No.
7.	<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 Anode heat storage capacity of at least 107 KHU or more</p>	2 Nos.

Item No.	Name of Goods, Technical Description, Specifications and Standards	Qty.
	<p>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 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. <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. • Clearly mention country of origin of company and country of manufacturing of offering equipment. <p>Country of Origin: USA / Japan / Europe</p>	
8.	<p>PRINTER</p> <p>DICOM 3.0 compliant Grayscale Dry LASER / Thermal Printer with 3 online sizes. Should have minimum productivity of 150 films/ hour in mixed sizes. Printer should be capable of printing 08x10, 10x12, 11x14, 14x14 & 14x17 size films. Minimum resolution should be 10 pixels/mm with 12 -bit gradation. 80 Sheets Per Hour. Printers should connect with mammography and compatible with mammography printing. 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>	1 No.
9.	<p>CR SYSTEMS</p> <p>Reading gray scale “12 Bits” 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>	1 No.