Medical and Laboratory Equipment
Faisalabad Institute of Cardiology, Faisalabad.

Item Name	Specifications	Qty
Medical Gas Supply System	**APPLICABLE STANDARDS/ CONFIGURATION:** The Medical gas Pipe line should strictly comply with the international standards and configuration for requirements of HTM 2022 or latest, however, ISO 7396-1 or latest can also be used. It would be the choice of the bidder for adherence to any standard which would be mentioned in the bid. The objectivesare to ensure the following: a) Non-Interchangeability Between Different Pipeline Systems By Design; b) Continuous Supply Of Gases And Vacuum at Specified Pressures By Providing Appropriate Sources; c) Required Flow Rates In Particular Areas/ Outlets; d) Use Of Suitable Materials; e) Cleanliness Of Components; f) Correct Installation; g) Provision Of Monitoring, Controls and alarm at single site. h) Correct Marking Of The Pipeline System; i) Following Of Testing And Commissioning Protocols; j) Maintaining The Purity Of The Gases Delivered By The Pipeline System; k) Correct Operational Management. **BED HEAD UNIT FOR WARDS & PRIVATE ROOMS (Qty: 68Nos)** • Each unit consists of: 1,000 mm and above • Horizontal type • Built in over bed Light with ON/OFF switch. • Built in reading Light, with ON/OFF switch. • Provision for Nurse Call/ Alert Button • Gas outlets (2x Air, 3x Oxygen complete fitted). •Electrical provisions; •Electrical sockets: 4 Nos. & 2Nos. Multi Pin Plug and above schuko/ F-type All wiringconforms to standards, ground/earth •Separate ducts for Electrical & Gas Pipes. •Country of Manufacturer for BHU (Aluminum profile) and electrical accessories should be Local / Imported however Gas outlets should be from USA / Europe / Japan **ALARM AREA WITH REMOTE SENSORS (Qty: 07Nos)** Digital Display Alarm area with remote sensors for two gas. Individual display and sensor module. Self-diagnostic & error message display readable for ease of maintenance psi, kPa or bar readout. Test & Mute Button, low alarm condition **Country of Manufacturer** USA / Europe / Japan **MULTIPLE ZONE VALVE BOX (Qty: 07Nos)** Multiple zone valve box for two Each wall type zone valve box shall consist of the following Components. A steel valve box/Aluminumwhich can house two to six shutoff ball valves. Pressure gauges to display the pressure of various gases.NIST Connection) **Country of Manufacturer** USA / Europe / Japan **OXYGEN & AIR FLOW METER WITH S.S PROBE (Qty: 68Nos)** Oxygen flow meter with (unbreakable, autoclavable humidifier bottle) S.S probes Oxygen Flow metercomplete set from 1 to 15 l.p.m. **Country of Manufacturer** USA / Europe / Japan **COPPER PIPING** Supply and installation of seamless medical graded(ISO13348EN.) copper pipe, deoxidized and degreased along with required fitting etc., various sizes /diameter as per	**01 system**

	Drawing of the project and Design standard of the bidder with matching color indications of out lets. 28 mm = 950 feet 22 mm = 2000 feet 15mm = 1640 feet 12mm = 1700 feet Oxygen: White Air: Black **Country of Manufacturer** USA / Europe / Japan **Optional:** The bidder should quote bed head unit aluminum profile per running feet for continuous installation work **SPECIAL TERMS & CONDITIONS:** 1. All equipment must be according to international safety standard. 2. The color of outlets, piping and cylinder for recognition will be BS type for all the system equipment. 3. The drop outlet/ Connection will be flushed surface. Separate ducts for piping and electrification 4. The lowest bidder will be calculated through entire package price.	
Cardiac Monitor	**1.** Bedside Monitor to display vital signs and other parameter for Adult & Paeds **2.** **Operating Features and Characteristics:** **3.** Screen Size: At least 15" diagonal (Touch Operated) or better with non-fade LCD / TFT LCD / LED color display **4.** Electro-Surgical Interference Suppression / Protection **5.** Defibrillator Protection **6.** Freeze and Cascade Facility **7.** Waveform: Six wave forms or more **8.** Waveform Traces Speed: 25 & 50 mm / sec **Parameters:** **9.** ECG **10.** Numeric: Heart Rate **11.** Real Time, and freeze ECG Trace **Non-Invasive Blood Pressure (NIBP):** **11.** Method: Oscillometric Principle **12.** Numeric: Systolic, Diastolic, and Mean Pressure **13.** Selectable auto inflate interval settings **14.** Rising Cuff / Continuous Pressure Display **Temperature:** **15.** Numeric: Temperature selectable in °C / °F **Pulse Oximetry:** **16.** Numeric: 0 – 100% oxygen saturation measuring range **17.** Waveform-Plethysmograph Pulse with Pulse Strength Indication **Arrhythmia Analysis:** **20.** Arrhythmia Analysis **Respiration:** **21.** Breath Rate display and settable apnea alarms **22.** Sweep Speed: 6.25, 12.5 mm / sec or better **Other Features:** **23.** Trend Data: Graphical / Tabular with at-least 48 hours' back-up or better **Alarms:** **24.** High & Low (settable) on all parameters **25.** Visual and audible indication of alarms **Other Parameter:** **26.** Operating Requirement: AC 220 V & 50 Hz **27.** Built-in rechargeable battery for fully operational back-up for at least 1.5 – 2	65

	hours or online pure Sine wave UPS (imported) with fully operational back-up for at least 2 hours or better **Communication:** **28.** Capability to interface with LAN / WLAN for data transfer **Accessories:** ▪ The system must be complete with all sensors, probes, cables, or any other accessoriesrequired for measuring all the above selected parameters ▪ Reusable Cuffs (Latex Free) for adult ▪ Reusable Sensor (adult) ▪ Operational & Service Manual **Optional (If any):** ▪ IBP 2 channel. ▪ Printer 2 / 3 channels or better. ▪ Wall Mounting Stand This unit should be high quality local (S.S 304 L) as per manufacturer recommendations ▪ **Safety Standard:** Must conform to the requirements of ISO 13485:2016 version or above **Quality Certificates:** Unit should be FDA510k and CE (MDD) or MHLW certified **Country of Manufacturer:** USA/Europe/UK/China/Korea	
ECG Machine (6 - Channel)	**1.** Six Channels ECG on at least 3 – 5 inches LCD display or better **2.** Display of six channel ECG simultaneously **3.** Manual and Automatic Operation **4.** Variable Gain: 1/2, 1, 2 cm / mV **5.** Interpretation Software both Adult and Paeds **6.** Recording Trace speed: 10 / 12.5, 25 and 50 mm / sec **7.** Muscle artifact and AC (50 Hz) interference filters **8.** Defibrillator Protection **9.** Built-in battery operation with 60 mins standby backup or better / Can acquire and prints15 ECGs without recharging **10.** Paper Size: 100 – 110 mm or larger **11.** Noise Filter and Baseline Correction **12.** Capability to interface with LAN / WLAN for data transfer **13.** Thermal Recorder for printing out of Six Channels simultaneously **14.** Paper Rolls / Z Folds / Recording Papers: Quantity = 10 (Each Roll Length minimum 20meters) **15.** Operating Requirement: AC 220 V & 50 Hz **16.** Securing / fixation to the mobile Cart by strap or other means must be provided **Accessories:** ▪ Complete with all Standard Accessories, including patient cables for Adult & Paediatric use with re-usable electrodes and for Neonatal use with re-usable electrodes ▪ Operational & Service Manual **Optional (If any):** ▪ Paper Rolls / Z Folds / Recording Papers (Each Roll Length minimum 20 meters)(Quantity 50 No,s with each machine) **Safety Standard:** ▪ Must conform to the requirements of ISO 13485:2016 version or above	**05**
Defibrillator	**1.** Biphasic Transthoracic (External) Defibrillator **2.** LCD color display with Screen Size of approx. 5 inches or better **3.** Synchronized output with ECG **4.** For External Defibrillation Energy Selection & Delivery on Control Panel and /	**05**

	Or ExternalPaddles **5.** For Internal Defibrillation Energy Selection on Control Panel and / Or Internal Paddlesand Delivery must be on Internal Paddles **6.** Charging Indicator **7.** The energy range should be adjustable for Neonates, Paeds and Adults up to 200 Joulesor better **8.** Charging Time for full energy should be less than 6 – 7 seconds **9.** Display of HR, ECG through paddles and Lead I, II & III patient cable **10.** Built-in recorder for printing of full summery on standard 50 mm paper **11.** Alarms for High and low Heart rate, low battery warning **12.** Auto Tester / Self-Check **13.** External Paddles (Adult and Paeds) **14.** AED Facility with Cable **15.** Pacing Facility **Other Parameters:** **16.** Operating Requirement: AC 220 V & 50 Hz **17.** Built-in Rechargeable battery with charger for minimum 100 shocks at maximum energy **Accessories:** ▪ Complete with all Standard Accessories ▪ Local Trolley Manufacturer's Standards with antistatic castors / wheels and all precautionary measures applicable Operational & Service Manual **Safety Standard:** ▪ Must conform to the requirements of ISO 13485:2016 version or above	
Mobile Echocardiography Machine	Vendors are required to quote Top of the line system for the said category / specifications. **1.** A complete dedicated digital Echocardiography unit for wide range of premium performance application of cardiovascular imaging in paediatrics and adults **2.** Wheel based Mobile Trolley mounted system with user friendly Ergonomics, adjustable Height, and sideways easy maneuverability **3.** Built in workstation / data management system for digital acquisition, storage and review of complete cardiac ultrasound studies including static and dynamic clips in DICOM format, read / write zoom **4.** Studies can be reviewed, and output should be stored to CD / DVD / USB **5.** The machine must have sharp and high-quality image reproduction with heavy duty performance **Operating Features and Characteristics:** **6.** Display Resolution: High Definition 1280 x 1024, non-interlaced, flicker free, Tilt-able,and Swivel-able type **7.** Minimum Display Size: 21" or better LCD / TFT LCD / LED **8.** Operating & Display Modes: **a)** 2D B-Mode **b)** 2D M-Mode **c)** 2D-CDI Mode **d)** 2D-CDI -Doppler Mode **e)** 2D Tissue / Mode **f)** Color M-Mode **g)** Anatomical M-Mode **h)** Spectral Doppler **i)** Color Doppler **j)** Velocity Mode **k)** Doppler (PW & CW)	**01**

l) Duplex and Triplex Doppler
m) CW Doppler Steerable
n) ECG Gating
o) PW / HPRF Doppler
p) Intima Media Thickness (IMT)
q) Tissue Harmonic Imaging
r) Myocardial 2D - Strain Imaging / Tissue Tracking (Tissue Doppler based / SpeckleTracking based)
s) Stress Echo Mode (Physical and Pharmacological)
t) Transesophageal Echo
u) Vascular Calculations / IMT
v) Tissue Synchronization Imaging Mode
w) Tissue Velocity Imaging Mode / CRT Evaluation Tool / Tissue Doppler Imaging Mode
x) 2D Angio Flow / Power Doppler Imaging
y) Color Flow / Color Doppler Imaging
z) Cardiac Measurements

On Board Review Display Formats:

9. Live and Stored Display Format: Full size and split screen
10. Post Processing of images and Biometry of Stored images
11. Review Image Format: For still and cine, simultaneous capability B+PW, B+ CFM /CDI (TVI / TDI)+PW, CW, B+ or triplex mode, B+ color split screen display

Control Panel:

12. Touch Command Screen Control at least 8" or more LCD / TFT LCD / LED with Accessible Presets and Users selectable Presets with options of Modification of Presetparameters according to user
13. Alphanumeric keyboard with built-in trackball
14. Direct access to system functions through dedicated keys
15. Indicator lights identify activated keys
16. Audio volume control with bidirectional / stereo speakers and foot switch
17. User selectable image magnification control
18. Adjustable transmit focusing control
19. Time Gain Compensation controls (6 or more)

Caliper / Measurements:

20. 6 to 8 calipers for measurement per screen trace length measurements for distance, angle, distance depth from Skin Line, Area, Circumferences, Compound / Volume, Slope, Auto Doppler Calculation, Time, Heart Rate, Velocity and Acceleration / Deceleration

Application:

21. Cardiac, Peripheral, Paediatric, Adult Cephalic, Carotids, Peripheral Venous,Vascular, and transesophageal with all required software for measurements

Frame Rate:

Machine to be quoted with maximum available frame rate.

22. 500 f / sec or more in B-Mode and / or 190 f / sec or more in Doppler Mode

Cine-loop / Cine Memory Per Image Acquisition:

23. Minimum Cine Memory for 1,000 frames or better / 250 Mbs or better

Image Viewing Depth:

24. 20 – 280 mm or more for Cardiac Application

Imaging Modes / Techniques:

25. Harmonic Imaging, Tissue Doppler Imaging, Color Angio, Tissue Velocity Imaging Tissue Imaging (Display real time Doppler shift information from

moving tissue to better visualize and quantity myocardial function.)

26. Strain Imaging Tools: Doppler (Doppler based as well as speckle tracking base)
27. Quantitative Strain Rate Imaging: An advanced quantitative technique of Tissue Doppler Velocity
28. Strain Rate (A measure of the contractile motion of Myocardium)
29. The software should have the capability to show contrast agent only, tissue only orcontrast and tissue displays
30. 2D Strain for LV
31. Vascular Imaging Software for carotids / IMT measurement

Stress Echo Mode (Physical and Pharmacological):

32. Integrated multistage stress echo system for advance and Flexible Stress Echo Acquisition and measurement for LV B-Mode imaging
33. Quantitative analysis for contrast during stress examinations used with TDI / TVIprotocols

System Requirement:

34. Storage Device: Built-in USB / CD / DVD Drive
35. System Dynamic Range: Minimum 250 dB or more
36. Communication Software: System should conform to DICOM 3 communicationsoftware for Image Storage, Print, Query / Retrieve, Network Communication
37. Permanent Licensed DICOM 3 Communication Software must be installable onExternal Individual Computer

Probes:

38. 3 active transducers connectors for Trans-Thoracic, Transesophageal Probes and onefor CW pencil Probe
39. Should be light weight, capable of multiple center frequencies on transmit for 2D,color Doppler, TDI, PW and CW (Steerable) Imaging and to perform Harmonics

Other Parameters:

40. Operating Requirement: AC 220 V & 50 Hz
41. Built-in operational battery back-up for 30 mins (Without Printer) / Online pure sinewave UPS (Recommended by manufacturer) for 30 mins backup time for complete unit including Printer

Communication:

42. Networking DICOM Enabled: System must be compatible with Picture Archiving & Communication System (PACS) / Hospital Information System (HIS) / Radiology Information System (RIS) (The Procuring Agency and End-user to decide)
43. Export Formats: PDF / JPEG, BMP / MPEG, AVI / Window Media, DICOM, RAW DICOM
44. The system must have provision to attach External Monitor via USB or VGA / HDMI /DVI

Accessories:

- Complete with all Standard Accessories recommended by the Manufacturer
- Linear Probe Multi Frequency to Cover Frequency of 6.0 – 8.0 MHz
- Multi Frequency Phased Array Sector Probe to cover 2.0 / 2.5 – 4.0 MHz
- Multi Frequency Phased Array Sector Probe to cover 3.0 – 6.0 MHz / 5.0 – 8.0 MHz
- Digital B / W Thermal Printer with 50 rolls of papers
- Gel 20 L in bottles as per Manufacturer's Recommendation
- Online pure sinewave UPS (Recommended by Manufacturer) for 30 mins backup timefor complete unit including Printer
- Operational & Service Manual

PLASMA STERILIZER (H_2O_2)	• Chamber capacity: 140-160 Liters. • Microprocessor controlled Touch Screen Display. • Chamber should be made of stainless steel/Aluminum. • Double Door Pass through System. Dual Stage vacuum pump/. • Sterilization temperature Less than 55 Degrees. • Ability to integrate with batch Documentation Software. • System should have compatible UPS, • The unit should include all safety interlock, complete with built-in safety feature accordingto international accepted standards • Complete with baskets, • Built-in Thermal Printer (IO to specify) Machine are equipped with software having printerfacility if procuring agency required they may add as additional printer. ***STERILANT:*** 50 Cycles along with packing material. Which will be replaced by the contracting firm in case of expiry. Operating, services manuals should be provided. **NOTE** Supplying firm must have a factory trained service engineers in region having a high endservice training to encounter the problem based on service matter. Bidder should provide undertaking on legal paper along with technical offer that they will supply unit within thirty days after receipt of purchase order. One year comprehensive warranty with parts and labor.	**01**
Crash Cart Trolley	· Resuscitation trolley for emergency. · Stainless steel / ABS top. · Three or more drawers. · Lower cupboard with central locking / securing all drawers and cupboard. · Operated by cupboard door and use of security seals. · Double hook stainless steel I.V. Pole. · Push handle. · Quality cushion castors (2 x braking). · Cardiac board 600mm x 400mm with housing brackets at rear of trolley. · Universal rail system fitted to width of trolley. Country of manufacturer: Imported	**08**
Digital Color Doppler	Color Doppler with 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 and Endo-cavity Probe. 1) **B-MODE Specification:** a) Sector Scan Angle Variable in Four Steps. b) Viewing Depth: 30cm or more (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 /500MB or more Color Images. e) Real time and Freeze Image Magnification at least 10X** or more with panning for Real, Freeze and Memorized Images. 2) **M-MODE SPECIFICATION:** d) Magnification: x2 or more. e) Sweep Speed: Slow, Medium and Fast.	**01**

f) Color Display of M-Mode.

3) **D-MODE SPECIFICATION:**

c) Pulse-Wave Doppler Measureable Velocity Range.

d) HPRF Doppler.

e) **CONTINUOUS-WAVE DOPPLER:**

e) Measurable Velocity Range: Steerable.

f) Must have Doppler Beam Steering and Bi-Directional Stereo-Audio.

d) Colorized Spectrum Display.

f) Automatic Baseline and Velocity Range Control.

g) Live Measurements for Doppler Spectrum.

4) **COLOR DOPPLER MODE SPECIFICATIONS :**

- 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 4THI or more Frequency.
- Power Doppler.
- Triplex Mode for Simultaneous Display of Color B/M and D-Mode Displays.
- 250db or more system dynamic range or more.

8) MEASUREMENT PACKAGE:

To provide Comprehensive Software Package for Measurement of Distance, Circumference, Area, Time Depth, ANGLE, Velocity, Frequency, Heart Rate, Volumes, Nuchal Thickness Measurement Software to be Provided as a Standard.

9) SYSTEM COMPLETE WITH FOLLOWING FACILITIES AND ACCESSORIES:

- Minimum 21-Inches LCD / OLED Color Monitor, with Resolution 1280 x 1024 Pixels minimum.
- Foot-Switch.
- 4 Active Transducer Connector for trans-thoracic Probes.
- DVD /CD Drive for Image Storage to be Built-in to the System.
- 500GB 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 10.0" or more LCD / TFT or more.
- Full DICOM (Upgradable).

10) UPGRADEABILITY :

- System Software must be Upgradable.

11) STANDARD PROBES :

- 2 – 6 MHz Multi-Frequency Convex Probe for B/M/CDI/PW, strain and shear-wave Elastography.
- 7-14 MHz or more multi frequency linear probe for small parts and MSK studies.
- 5-9 MHz or more Multi-Frequency Linear Probe for vascular studies.

NOTE:

All Probes must be supplied by same Manufacturer.

± 1Mhz deviation from the quoted frequencies of probes would be considered as minor deviation.

STANDARD RECORDING DEVICES:

- 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)

12) Tissue Doppler Imaging Mode.

13) 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.

14) Auto Image Optimization / Quick Scan Imaging for Automatic STC / GAIN and

	Doppler Spectrum Adjustment with Optimal Image Quality by using One Touch Operation. 15) B-Flow / Dynamic Flow Imaging / E-Flow / Clarify. 16) Trapezoid Imaging / Virtual Convex Imaging with Linear Probe. Compound / Aplipure Imaging for THI/both Frequency Compounding and Spatial Compounding in B/W and Color Mode. 17) Panoramic / SIESCAPE / Logic view Imaging with Measurements. 18) TISSUE CONTRAST ENHANCEMENT SOFTWARE/SPECKLE REDUCTION/X-VIEW PLUS/CPI 19) N-Sight/ Adaptive Suppression/ Precision Imaging /Cross beam/ XFlow or equivalent to Enhance B-Mode Imaging, Xress/ Care/ DTCE or equivalent Detailed in Layers and Boundaries and Sharpened Outlines of the Lesions and reduce Cluttering. 20) Micro CPA/ Superb Micro Imaging/vascular enhancement/B flow HD Color/Micro-V spectral to Clearly Show Blood Flow in tiny Vessels, 21) Shear wave Elastography Quantification for body Organs especially Liver with both Convex & Linear Probes to visualize Tissue Stiffness by Generating Images through Shear Wave Propagation. 22) Live Strain Rate Elastography with Quantification for Body Organs Specially Breast to Visualize Lesions. Voltage : 220V – 240V, 50 – 60 Hz **Accessories :** 1. Thermal Printer 256-Gray scale (Sony, Mitsubishi or equivalent) 2. UPS: on line with sine waves 2 KVA with thirty minutes back up time. (IMPORTED) 3. 50 High Density / High Glossy thermal paper Rolls 4. Gel: 30 liters 5. Latest computer system with Printer for Ultrasound reporting. 6. Wall-hanging X-ray film viewer (2 Film viewer) **Optional:** 4-11Mhz micro-convex pediatric probe. Fusion imaging of CT / MRI 3D Volume DATA to Synchronize with Ultrasound Imaging. Complete with Hardware /needle navigation with tracking system. Contrast Harmonic Imaging Upgradable. HD imaging/luminance imaging process technology to make 3D/4D images of fetus and anatomical structures appear more realistic. 3D/4D multifrequency probe. Hockey Stick Probe. **WARRANTY** 05- Years Manufacturer's comprehensive warranty of the unit along with other third party items will be provided including service and spare parts for components of the system.	

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