



COMSATS University Islamabad, Lahore Campus
Defence Road, Off Raiwind Road, Lahore

Tender No. CUI-LHR-TN-20-1437

Case # 3198

Single Stage Two Envelop Procedure

Title of Tender: **Lab Equipment on FOR Basis for Establishment of Centre for Advanced Technologies in Biomedical Materials (CATBM PC-1)**

TERMS AND CONDITIONS

1. All pages of bidding documents are mandatory to be signed / stamped, meaning thereby bidder agrees to our terms & conditions mentioned herein, failing which the bid may be rejected.
2. Any addition, deletion or modification of any clause of the procurement terms & conditions/ BoQs of CUI Lahore Campus by any vendor will not be acceptable and may lead to rejection of the bid.
3. Only registered Suppliers, who are on Active Taxpayers List (ATL) of FBR, are eligible to participate in tender.
4. The contract will be executed and handed over in satisfactory conditions up to the entire satisfaction of COMSATS University Islamabad, Lahore Campus.
5. Documents along with Pay Order / Demand Draft amounting to **Rs. 1,000/-** as a tender document fee (Non-Refundable) shall be submitted in favor of COMSATS University Islamabad, Lahore Campus to the address given below. No bid will be accepted without tender documents' fee.
6. Part / Advance payments is not allowed.
7. **The exact completion/installation/ delivery time from the date of the purchase / work order will be 120 days. The handing over / completion time for this contract is of critical importance.**
8. Your bid proposal should be inclusive of freight and all other taxes and to be delivered at COMSATS University Islamabad (CUI), Lahore Campus's premises.
9. After opening of bids, CUI-Lahore Campus will examine the bids for completeness as per tender document.
10. In case more than one bidder have quoted same rates for an item; the bidder securing more items (in terms of cost) will be awarded the specific item.
11. Purchase order (s) will be awarded to the evaluated lowest or technically recommended bidder (s) on the basis of item wise / subtotal wise / grand total wise according to the nature of BoQs.
12. The bid should be submitted in a sealed envelope up to **December 28, 2020** on or before **1100hrs** and will be opened on the same date **at 1130hrs** in the presence of available bidders.
13. COMSATS University Islamabad, Lahore Campus, will follow the PPRA rule of **single stage two envelope procedure;**
 - i. The bid shall comprise a single package containing **two separate envelopes**. Each envelope shall contain separately the **financial proposal** and the **technical proposal;**

Signature & Stamp of Bidder

- ii. The envelopes shall be marked as “**FINANCIAL PROPOSAL**” and “**TECHNICAL PROPOSAL**” in bold and legible letters to avoid confusion;
 - iii. Initially, only the envelope marked “**TECHNICAL PROPOSAL**” shall be opened;
 - iv. The envelope marked as “**FINANCIAL PROPOSAL**” shall be retained in the custody of the procuring agency without being opened;
 - v. The procuring agency shall evaluate the technical proposal in a manner prescribed in advance, without reference to the price and reject any proposal which does not conform to the specified requirements;
 - vi. During the technical evaluation no amendments in the technical proposal shall be permitted;
 - vii. The financial proposals of bids shall be opened publicly at a time, date and venue announced and communicated to the bidders in advance;
 - viii. After the evaluation and approval of the technical proposal the procuring agency, shall at a time within the bid validity period, publicly open the financial proposals of the technically accepted bids only. The financial proposal of bids found technically nonresponsive shall be returned un-opened to the respective bidders;
 - ix. and
 - x. The bid found to be the lowest evaluated bid shall be accepted.
14. The envelope should be marked as under;
- Secretary, Purchase Committee**
COMSATS University Islamabad, Lahore Campus
 Defence Road, Off Raiwind Road, Lahore.
 Tel: 042-111-001-007, Ext: 875
15. The envelope shall also bear the word “**CONFIDENTIAL**” and following identification quotation of “**Lab Equipment on FOR Basis for Establishment of Centre for Advanced Technologies in Biomedical Materials (CATBM PC-1)**”.
16. The bid form (BoQs) must be duly filled in, stamped and signed by the authorized representative of the bidder.
17. **If the vendor fails to deliver the goods / services to COMSATS University Islamabad (CUI), Lahore Campus within the given deadline, any of the following can be opted by CUI Lahore campus on the recommendation of the end user and approval of the authority;**
- a. An extension in the delivery period may be granted in case a valid reason/justification with necessary documentary evidence is provided by the vendor supporting the reason for delay.
 - b. A penalty upto 10% of the invoice value may be charged.
 - c. Purchase order may be cancelled along with confiscation of earnest money if the vendor fails to deliver the goods / services after the initial or extended delivery time, as the case may be.
18. If the delivered goods / services are not according to the required quality standards / specifications, the same shall be liable to be rejected after inspection. The vendor would be required to supply as per requirements mentioned in our BoQs, otherwise the purchase / work order will be cancelled after due date with confiscation of earnest money.
19. Deduction of Income Tax and any other tax will be deducted at source according to Government prevailing rules.

- 20. Payment will be made on submission of Invoice in the name of “COMSATS University Islamabad (CUI), Lahore Campus” with a copy of delivery challan (s) after the complete order has been supplied, inspected and accepted which includes delivery / installation, and COMSATS acceptance / inspection thereof.
- 21. All prices should be valid for at least **120 days**. Withdrawal or any modification of the original offer within the validity period shall entitle CUI-Lahore Campus to forfeit the earnest money in favor of the CUI-Lahore Campus and / or put a ban on such vendor participation in tenders / works.
- 22. It is the sole responsibility of the agent / supplier / manufacturer to comply with the applicable laws, be national or international.
- 23. In case of any dispute or grievance, the matter shall be addressed as per PPRA rules.
- 24. The CUI-Lahore Campus reserves the right to modify the quantities of goods / services at any time before the award of purchase / work order.
- 25. Warranty mentioned in BoQs shall be provided from the date of installation or standard warranty whichever is higher
- 26. **05% of the total value of the Invoice will be retained as security by COMSATS University Islamabad (CUI), Lahore Campus, and will be released after warranty period i.e. As Mentioned in BoQs which will be counted from the date of Installation / Completion of work / Supply.**
- 27. **The bidder is required to furnish in form of Bank deposit/ CDR / Pay order equivalent to 2% of the total Bid price as Earnest Money crossed in favor of “COMSATS University Islamabad, Lahore Campus”.**
- 28. **CUI Lahore Campus reserves the rights to reject the bid if;**
 - i. Received without earnest money
 - ii. Received later than the date and time fixed for tender submission
 - iii. The tender is unsigned/ unstamped
 - iv. The offer is ambiguous
 - v. The offer is conditional
 - vi. The offer is from a firm, which is black listed by any Govt. Office.
 - vii. The offer is received by telephone/telex/fax/telegram.
 - viii. Any unsigned / ambiguous erasing, cutting / overwriting etc. is made.
- 29. The bidder should furnish a certificate as worded below in token of acceptance of all the terms and conditions of the tender otherwise the tender will not be considered under any circumstances.
- 30. The undersigned affirm that the terms and conditions as contained in this document have been read and accepted and that in the event of selection of my/our rate the agreement in the prescribed form will be entered into:

- **Company / Vendor Name:.....**
- **Postal Address:.....**
- **Tel. / Mobile:.....Email:.....**
- **NTN#:.....GST#:.....**
- **Signature:**

- Please also attach the Certificate supporting being Active Taxpayer as per requirement of FBR.

BoQs of Lab Equipment on FOR Basis for Establishment of Centre for Advanced Technologies in Biomedical Materials (CATBM PC-1)

Technical Portion (Please mention the quoted model/ brand in technical portion with no mention of price otherwise the bid will be rejected)

No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).				Qty	Please mention the quoted Model / Brand with meeting the all specifications mentioned in BoQs
Sr. #	Equipment Name	Required Specifications			
1	Ultrasonic Bath	Purpose of Ultrasonic Bath	For ultra-sonication in analytical, industrial and medical applications, including intensive cleaning	03	
		Material	Stainless Steel		
		Frequency range (kHz)	Variable frequency		
		Timer	Must be present		
		Temp. range (°C)	Up to 80 °C		
		Ultrasonic Power (W)	100 or higher		
		Control Mode	Digital		
		Capacity (L)	5 or more		
		Accessories	Basket	03	
			Cover	03	
		Installation	Complete onsite installation		
Warranty	12 Months or more from the date of installation (parts and service)				
2	Dosing Pumps	General Requirements	Type: Diaphragm PTFE	5	
			All parts which come into liquid contact should be acid, alkali, solvent resistant self-priming, maintenance free		
			Adjustable flow rate		
		Flow Parameters	Variable flow rates		
			maximum flow rate to be between 75-200 ml/min		
		Tubing	10 feet or more Acid, alkali and solvent resistant tube with all requisite connectors		
Installation	Complete onsite installation				

		Warranty & Others	12 Months or more from the date of installation (parts and service)		
3	-20 °C Freezer	Type	Upright Type	02	
		Chemical resistance	Yes		
		Variable temperature range (°C)	-8 (or higher) to -25 (or lower)		
		Exterior Material	Steel		
		Effective capacity	300 L or higher		
		Display temperature	Digital display	02	
		Voltage Stabilizer	As recommended by OEM		
		Installation	Complete onsite installation		
Warranty	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) • 5 years compressor warranty 				
3.1	-20 °C Freezer	Type	Upright Type	03	
		Chemical resistance	Yes		
		Temperature required	-20 or lower		
		Exterior Material	Steel		
		Effective capacity	300 L or higher		
		Display temperature	Digital display	03	
		Voltage Stabilizer	As recommended by OEM		
		Installation	Complete onsite installation		
Warranty	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) • 5 years compressor warranty 				
4	Vacuum Pump	Purpose of the Vacuum pump	Vacuum pump for routine laboratory work with Vacuum/pressure gauge	03	
		Construction	Oil Free Vacuum Pump		
		Vacuum attainable	60 torr or higher		
		Installation	Complete onsite installation		
		Warranty & Others	12 Months or more from the date of installation (parts and service)		
5	3D Camera	Purpose	A 3D Camera/Scanner for scanning of objects as 3D feed models for 3D printers, with USB supported interface	01	

		Camera resolution	1.3 MP or higher			
		Scanning Volume	100 mm (or higher) * 100 mm (or higher) * 75 mm (or higher)			
		Accuracy	15 µm or better			
		Interface	USB 3.0			
		Output format	Must include .obj, .stl,			
		Software	For image acquisition and analysis			
		Computer	Core i5 or better, licensed windows 10, 16GB RAM, 500 GB or higher SSD hard-disk, Dedicated Graphics card 2 GB or higher (must be compatible with the 3D Scanner), with power backup (UPS)	01		
		Accessories	Scanner stand, bracket, turntable, requisite cables and all accessories which are essential	-		
		Installation	Complete onsite installation			
Warranty	12 Months or more from the date of installation (parts and service)					
6	Syringe Pumps	Purpose	Syringe pump for Fabrication of electrospun mats and electrospraying of solutions for specifically biomedical applications	03		
		General features	single channel syringe pumps for electrospinning, able to work under high voltages (up to 50kv) with digital display			
		Syringe pump	Channels			Single channel pumps with controllable flow rate. May have ability to load multi syringes
			Working temperature			5-40 °C (or better range)
			Pumping rate			Digitally controlled variable pumping rate
			Pump rate accuracy			: +/- 2%
		Accessories	Needle sets 11 g to 27 g			03 or more
		computer	Compatible with machine for data logging with 24 inch or bigger screen	03		
Installation & training	Complete onsite installation and training					

		Warranty	12 Months or more from the date of installation (parts and service)				
6.1	Syringe pump	Purpose	Syringe pump for Fabrication of electrospun mats and electro spraying of solutions for specifically biomedical applications	01			
		General features	Two channel syringe pumps for electrospinning, able to work under high voltages (up to 50kv) with digital display				
		Syringe pump	Channels			Two-channel pump: can be controlled independently for individual syringe Flow rate, volume and time of infusion can be controlled precisely. Compatible to work under high voltage.	
			Working temperature			5-40 °C (or better range)	
			Pumping rate			Digitally controlled variable pumping rate	
			Pump rate accuracy : +/- 2%				
		Accessories	Needle sets			11 g to 27 g	01
			coaxial needle set				01
		Computer	Compatible with machine for data logging with 24 inch or bigger screen			01	
		Installation & training	Complete onsite installation and training				
Warranty	12 Months or more from the date of installation (parts and service)						
7	Flow Pumps	General features	<ul style="list-style-type: none"> ▪ Type: Peristaltic ▪ Variable-Speed ▪ Graphical LCD display ▪ Reversible motor with on/off/reverse possibility 	01			
		Key Components	Complete Digital system Containing: <ul style="list-style-type: none"> ▪ Variable-Speed Pump drive ▪ Multiple pump heads ▪ Tubing ▪ Pump head Mounting Hardware 				
		Pump Drive and Head	Variable-Speed Digital Drive with pump head			1	

			having flow rate range 5 ml/min (or lower) to 2800ml/min: (or higher)		
		Speed Resolution	01 rpm		
		Flow Tubing Set (20-25 feet length)	Provide Flow rate 1 or lower to 450 ml/min or higher	1	
			Provide Flow rate 50 or lower to 2000ml/min or higher	1	
		Installation	Complete onsite installation		
		Warranty & Others	12 Months or more from the date of installation (parts and service)		
7.1	Flow Pumps	General features	<ul style="list-style-type: none"> ▪ Type: Peristaltic ▪ Variable-Speed ▪ Graphical LCD display ▪ Reversible motor with on/off/reverse possibility 	1	
		Key Components	<p>Complete Digital system Containing:</p> <ul style="list-style-type: none"> ▪ Variable-Speed Pump drive ▪ Multiple pump heads ▪ Tubing ▪ Pump head Mounting Hardware 		
		Pump drive and head	Variable-Speed Digital Drive with pump head having flow rate range 1 ml/min (or lower) to 480ml/min or higher	1	
		Speed resolution	0.1 rpm		
		Flow Tubing	<ul style="list-style-type: none"> • Provide Flow rate 10 or lower to 200 ml/min or better • Can bear pressure minimum 2 bar or higher 	20-25 feet each	
			Provide Flow rate 0.5 or lower to 150 ml/min or higher		
		Installation	Complete onsite installation		
		Warranty & Others	12 Months or more from the date of installation (parts and service)		

8	Safety Cabinet	Purpose	CE certified Total exhaust cabinets for work with toxic chemicals and infectious agents	03
		Class	II	
		Type	B2	
		Internal size (mm)	Width =1100 or more Depth =550 or more Height = 550 or more	
		Filter	HEPA/ULPA	
		control	<ul style="list-style-type: none"> • Graphical LCD display • on/off fan control with adjustable air velocity • Working window control • LED lamp ON/OFF • UV lamp ON/OFF • Elapsed time counter and alarm for HEPA filter replacement 	
		Chamber Materials	Stainless Steel	
		Window	Tempered glass	
		Other features	<ul style="list-style-type: none"> ▪ Compatible trolley ▪ UV light 	
		UPS backup	As recommended by OEM	
		Installation & training	Complete onsite installation and training	
		Warranty & Others	12 Months or more from the date of installation (parts and service)	
9	Blue LED Lights	Purpose	Curing of dental composites using LED UV irradiation	03
		General features	<ul style="list-style-type: none"> ▪ Rechargeable ▪ Wireless useability ▪ Base-charger with hand piece holder 	
		Wavelength (nm)	Any value between (380-520)	
		Power	1250 mW/cm ² or better	
		Accessories	extra tips	06
			extra battery	03
		Warranty	12 Months or more from the date of installation (parts and service)	

9.1	Blue LED Curing Unit	Purpose of the LED Spot Curing System	UV spot curing	01	
		General features	UV light system for spot curing having four independent channels		
		LED Heads	<ul style="list-style-type: none"> • 365 nm • 385 nm • 395 nm • 405 nm 		
		Spot Size	5 mm (or less) to 15 mm (or more)		
		UV Intensity (variable)	Upto 13 W/cm ² or better		
		Display	Digital display for operations		
		Accessories	Radiometer and calibration kit		
			Protective gear		
			Extra set of LED head (01 each)		
Installation & Training	Complete installation and all standard accessories with onsite training				
Warranty	12 months or more from the date of installation (parts and service)				
10	High Speed mixer	Purpose	High speed mixer is proposed to blend and grind a range of materials (ceramics, polymer etc)	01	
		Motor	70 Watts (or more)		
		Adjustable speeds	0-6000 rpm (or more)		
		Capacity	0.5 L (or less) to 5 L (or more)		
		Other features	automatic shutoff		
		Assemblies (stainless steel)	assembly for 0.5 L (or lower) to 1L (or more)		
			assembly for 2 L (or lower) to 3 L (or more)		
			Assembly for 4 l (or lower) to 5 L (or more)		
Accessories	Emulsification Shear Stator				
	Emergency stop button with timer				
Installation & training	Installation and on-site training				
Warranty and Others	12 Months or more from the date of installation (parts and service)				

11	Precision Cutting Machine	Purpose	Precision cutting machine for cutting of metals, ceramic and polymers.	01
		Cutter features	The unit is capable of precision cutting of samples under gravity (manual cut off). Equipped with replaceable wearing plates including all the necessary clamping devices, cut off liquid and user manuals.	
			Cutting Capacity: minimum dia 25 mm with x-axis adjustment of minimum 25 mm	
			working wheel (replaceable): upto 150 mm (or higher)	
			Vertical movement: Sample movement through Gravity	
			Variable Speed: minimum 300 rpm (or lower) to 1000 rpm (or higher)	
		Accessories	Sample vise universal	2
			Set of flanges	1
			Oil for precision cutting (litre)	5
			Diamond Cutt off wheels: Dia 150 x thickness 0.40 mm 05 blades in one pack	1 pack
		Sample mounting press	Automated Hydraulic press for mounting of cutting samples with digital control for heating time, molding temperature, ramp control and start & stop cycle programming <ul style="list-style-type: none"> ▪ Temperature 200°C (or higher) ▪ Adjustable Heating and Colling time ▪ Pressure 250 bar (or higher) ▪ Any two Mold sizes in between 25-50mm 	01
Power backup with additional Servo Stabilizer	As recommended by OEM	01		
Installation & training	Complete onsite installation and training			
Warranty & Others	12 Months or more from the date of installation (parts and service)			

12	Bone Hand piece straight	Purpose	A dental handpiece is a hand-held, a mechanical instrument used to perform a variety of common dental procedures, oral surgery and altering prostheses	01	
		Body	1:1 straight		
			Titanium body or better quality		
			Clean Head System		
			Autoclavable up to 120°C		
		Application	For Bone or oral Surgery		
		Rotation	Up to 40000 RPM or more		
		Features	External Irrigation		
		Extra-Long burs	50 mm or adequate for microsurgery		
		Installation	Complete onsite installation		
Warranty	12 Months or more from the date of installation (parts and service)				
13	Dental Chair	Purpose	A complete dental unit for dental patient treatment	01	
		Dental Chair	Computer control motorized chair.		
			One touch pre-set memory		
			One touch zero return system.		
			Multicontrol Foot switch for chair.		
			Up/down and back/forward movements		
			Double articulating Head rest adjustable for neck positioning		
			Emergency stoppage switch		
			Air cylinder stable to stand any position.		
		Tray	3 hand pieces		
			Individual air pressure controls		
			One 3-way syringe for doctor with quick disconnect tip for autoclave.		
			X-Ray Viewer		
			Water flow control		
		Cuspidor Unit	Single Unit Porcelain Spittoon and Cup filler removable and autoclaveable		
			-Rotatable assistant Arm		
			High volume evacuator (air operated)		
			Water operated Saliva ejector		

		Junction Box	Air and Water supply lines with filters		
		Suction Machine	Suction motor rotation speed: 3000 rpm or higher		
		Ultrasonic Scalar Built-in Kit	Tips with holders	3	
			Autoclaveable hand piece	1	
			Autoclavable complete kit	1	
		Air Turbine	High speed air turbine (Push Type 4 hole)	1	
			Low speed air turbine with Contra angle hand piece attachment (key type 4 hole)	1	
		Installation & training	Complete onsite installation and training		
Warranty	12 Months or more from the date of installation (parts and service)				
14	Compressor	Purpose	<ul style="list-style-type: none"> Oil free single stage compressor with air storage tank suitable for high quality air demand for medical applications 	01	
		Power	4kW (or higher)		
		Pressure	10 bar (or higher)		
		Receiver/air tank (litre)	270 (or higher)		
		pumping Capacity (litre)	350 (or higher)		
		Installation	Complete onsite installation		
		Warranty	12 Months or more from the date of installation (parts and service)		
15	Crucible	General Features	<ul style="list-style-type: none"> Purity Level: Pt \geq 99.95% Volumetric Capacity: 5 mL 	01	
			<ul style="list-style-type: none"> Purity Level: Pt \geq 99.95% Volumetric Capacity: 20 mL 	01	
		Quality	Purity certificate must be provided		

16	3D printer (FDM)	Purpose	Open Source printer for additive manufacturing of high-quality polymer and composite structures	02
		build volume (cm)	22x15x15 or larger	
		Dual extrusion	Able to print with two different materials at a time	
		Layer Thickness (micron)	≤100	
		Build Platform	<ul style="list-style-type: none"> ▪ Heated platform to temperature ≥ 100 °C ▪ Aluminum or glass materials 	
		Nozzle temperature	<ul style="list-style-type: none"> ▪ ≥ 180 °C 	
		Filaments	<ul style="list-style-type: none"> ▪ Filament needed – PLA, ABS, PCL (1 Kg each) 	
		Nozzel Diameter (mm)	0.3 to 0.5 (Any value in this range)	
		Filament extruder and winder	<ul style="list-style-type: none"> • Can extrude filaments from composites • Should be compatible with the provided 3D printer 	
		Softwares	<ul style="list-style-type: none"> • System supporting softwares • should support STL files 	
		Computer	Compatible with machine for data logging with 24 inch or bigger screen	
		Power back up	as recommended by OEM for optimum operations	
		Installation & training	Complete onsite installation and training	
		Warranty	12 Months or more from the date of installation (parts and service)	
17	Thermal cycler	Purpose	For amplification of DNA using polymerase chain reaction	01
		Capacity	96-well x 0.2 ml tubes	
		Temp. Range	4°C (or below) to 99.9°C (or higher)	
		Temp Accuracy	±0.5°C or better	
		Temperature Gradient zones	3 or more	
		Display option	LCD display	
		Heating rate	Heating: 3.0°C /sec or more Cooling: 3.0°C /sec or more	
		Temperature uniformity	≤0.5°C	
		Installation & training	Complete onsite installation and training	

		Warranty	12 Months or more warranty from the date of installation (Parts and services)		
18	Liquid nitrogen tank	Liquid nitrogen supply tank	Tank made of stainless steel For safe supply and storage of liquid nitrogen	01	
		Capacity	100 Liters or more		
		Tanks rating	22 psi or better		
		Accessories	Cylindrical roller base		
			Cylinder hand truck with wheels		
			4 ft. flexible braided stainless-steel transfer hose or better		
			LN2 fill phase separator		
			Temperature Sensor		
			Pressure gauge		
			Liquid nitrogen level indicator		
			First Safety valve		
			Second Safety valve		
			Fill and withdraw valve		
		Solenoid valve			
Pressure building valve					
Installation & training	Complete onsite installation and training				
Warranty & Others	12 Months or more from the date of installation (parts and service)				
18.1	Liquid nitrogen tank	Liquid nitrogen tank for cell storage	CE certified Tank made of For safe storage of cells	01	
		Capacity	30 liters (or more)		
		Vial capacity (1.2-2 mL)	600 (or more)		
		Evaporation rate	0.2 litres/ day (or lower)		
		Accessories	Vial rack	04	
			2 ml cryo-vial box	10	
			1 ml cryo-vial box	10	
			0.5 ml cryo-vial box	5	
Warranty & Others	12 Months or more from the date of installation (parts and service)				

19	CNC Laser Cutting Machine (With additional laser marking requirement)	Purpose	The laser system should be capable of high accuracy laser marking (metals & non-metals) and laser cutting (soft materials). The capability to perform desired function can be achieved by a single system or two independent systems meeting the specifications		01
		Laser Cutting	Laser power (W)	150 (or higher)	
			Laser source	CO ₂	
			Laser focus	Auto	
			Working area (mm x mm)	1300 (or higher) x900 (or higher)	
			Position accuracy	±0.05 mm or better	
			Smallest achievable feature	1x1 mm (or lower)	
			Connectivity	Computer with software and 24 inch or better screen	
		Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats		
		Laser Marking	Laser Power (W)	50 or better	
			Laster Type	Fiber	
			Marking depth (mm)	0.1 (or higher)	
			Working Area (mm)	100 x 100 (or higher)	
			Working accuracy (mm)	0.01 or better	
Smallest achievable feature (mm)	0.2 or better				
Operation	Computer with software and 24 inch or better screen				

			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats		
		Power backup	Suitable power back up for the system. In case two separate systems are provided then two separate backups are required			
		Installation & training	Complete onsite installation and training			
		Warranty & Others	12 Months or more from the date of installation (parts and service)			
19.1	CNC Laser Cutting Machine (Without additional laser marking requirement)	Purpose	The laser system should be capable of high accuracy laser cutting.			
		Laser Cutting	Laser power (W)	150 (or higher)	01	
			Laser source	CO ₂		
			Laser focus	Auto		
			Working area (mm x mm)	1300 (or higher) x900 (or higher)		
			Position accuracy	±0.05 mm or better		
			Smallest achievable feature	1x1 mm (or lower)		
			Connectivity	Computer with software and 24 inch or better screen		
		Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats			
		Power backup	As recommended by OEM			
Installation & training	Complete onsite installation and training					
Warranty & Others	12 Months or more from the date of installation (parts and service)					

20	Drill Machine	General Features	<ul style="list-style-type: none"> • Benchtop Drill machine with digital system to read drilling speed and depth • Keyless precision chuck • Adjustable speed (RPM) • Adjustable drilling height • Multi gear • Laser pointing system for precision drilling 	01			
		Drilling capacity in mild steel	13 mm (or higher)				
		Drill stroke	90 mm or better				
		Power in put	700 Watt (or higher)				
		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months or more from the date of installation (parts and service)				
21	Centrifugal Grinder	Bench grinder	<ul style="list-style-type: none"> • eye shields, spark deflectors, tool rests, adjusting wrench • Overload Protection • Tool-Free Adjustable Guard • 3/4 hp induction motor or higher power • 3,600 rpm or higher • wheel guards • 12 inch or more distance between wheels for larger and longer grinding applications 	01			
		Accessories	Grinding wheel coarse (40-60 grit)			01	
			Grinding wheel fine (100-150 grit)			01	
		Angle grinder	General features <ul style="list-style-type: none"> • Power: 800 watts (or above) • Cutting Wheel Size: 100 mm or equivalent • Speed: 10,000 rpm (or higher) • Cable length : 2 meter (or more) • Body Grip tool for firm hold • Lock on switch for continuous use • Complete with all accessories 			01	
		Installation	Complete onsite installation				

		Warranty and others	12 months or more from the date of installation (parts and services)		
22	Arc welder	General Features	Multi-purpose <ul style="list-style-type: none"> • Manual/Stick • TIG • Should be able to weld Stainless Steel, Steel, Aluminum • Display screen 	01	
		Stick Welding Output	180 A (230 V) @ 25% duty cycle or better		
		TIG Welding Output	180 A (230 V) @ 30% duty cycle or better		
		Accessories	All requisite accessories to perform aforementioned tasks as highlighted in General Features should be provided (which includes but may not be limited to torches, regulators, gas cylinder)		
		Class of Protection	IP21S or better		
		Installation & training	Complete onsite installation and training		
		Warranty & Others	12 Months or more from the date of installation (parts and services)		
23	Manual & Power Tool and Consumables	Workstations	6 feet or more length of Workstation for tool storage and tabletop for day to day work	01	
			30,000 cu. inch or more capacity load		
			2 feet or more professional working depth		
			Workstation should be equipped with 15 or more, ball-bearing drawers that hold up to 100 lbs. or above with 200 lbs. or above capacity in the deeper drawers.		
			<ul style="list-style-type: none"> • Powdered coated Steel Body • Thick 18 Gauge or better 		
		Auto Return Drawers			
Mixed Tool SET	<ul style="list-style-type: none"> ▪ 400 or more pieces ▪ Blow molded durable carry case ▪ Meets or exceeds ANSI specifications 	1 complete set			

			<ul style="list-style-type: none"> ▪ Chrome-molybdenum steel according to SAE and MM standards 	
			<p>Should include but not necessarily be limited to;</p> <ul style="list-style-type: none"> ▪ Utility Knife, ▪ 5m/16ft Tape Measure ▪ Screw drivers (different types) ▪ Adjustable Wrenches ▪ Hex. Key wrenches ▪ Pipe Wrench ▪ Pliers ▪ Dr. Specialty bits, sockets ▪ Hammers ▪ Extension Bar 	
		Brushless Cordless Drill & Impact Driver Kit	18v Brushless 3/8 in. drill and impact driver	01
			<ul style="list-style-type: none"> ▪ High speed transmission with 2 or more speed settings ▪ With LED lights to illuminate the work surface ▪ Compact, lightweight design for tight spaces ▪ 2 extra batteries for drill as well as impact driver & charger ▪ Wide range of drill bits (hard coated & wear resistant) 	
			12 Months or more warranty from the date of installation (parts and services)	
		Brushless Hammer drill	Integrated lithium ion Battery	01
			Torque: 1,220 in-lbs	
			Variable speed	
			2 extra Lithium Ion Batteries	
			Charger	
			Power 36V	
			Brad Point Drill & Masonry Bits (tungsten carbide tips)	
			Screws / Fasteners	
			HSS Drill Bits	
			Magnetic Bit Tip Holder	
			1" Bits, 2" Bits, 3-1/2" Bits	
			Nut drivers	
			Ratcheting Screwdriver	
		Gauge		

			Sockets Socket Adaptor Storage box 12 Months or more warranty from the date of installation (parts and services)		
		Hammer Drill (Corded)	2-position switch to select standard or hammer drill functions 6.5 Amp or more power Quick-change chucks – changing bits must be fast and tool-free Working mode: Hammer drilling, Drilling, Chiseling 3000rpm Single-sleeved chuck for easy bit changes Multi-position side handle for ease of use 1/2 in. chuck to accommodate larger bits along with associated bits 12 Months or more warranty from the date of installation (parts and services)	01	
		Chop Saw	<ul style="list-style-type: none"> ▪ To cut through metal ▪ 15 A or more 14 in. (or more) Chop Saw to cut 12 Months or more warranty from the date of installation (parts and services)	01	
		Multipurpose Bench Vise	Jaw width 5-6-inch Jaw with Swivel Base Opening capacity 5 inch or more Throat depth 2 inches or more Captured safety jaw to prevent slide from falling out Fused steel handle Anvil incorporated Integrated pipe jaws 12 Months or more warranty from the date of installation (parts and services)	01	

24	CAD licensed software	CAD/CAM/CAE software License	software suite for computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), <ul style="list-style-type: none"> • Multiuser • Educational/startup/incubator 	01	
		CAM Machining software	Design Module	01	
			Lathe/ Swiss Lathe module		
			Milling 3d module including 4 axis rotary		
			Art module		
			Wire EDM Module		
			ProDrill Module		
			True Shape Nesting Functionality		
			Rast2Vec Functionality		
			Router 3D Module		
Data translations (including but not limited to): ASCII, CADL, DWG, DXF, EPS, IGES, Inventor (IPT, IDW, IAM), Key Creator (CKD), Parasolids, Rhino 3DM, SOLIDWORKS (SLDPRT, SLDASM, SLDDRW), SAT (ACIS Solids), Solid Edge (PAR & PSM), SpaceClaim (SCDOC), STEP, STL, VDA					
Life time license					
Computer	Workstation should be provided with specs to support aforementioned softwares. should include original windows with SSD hard disc, adequate graphics card and 24 inch screen	01			
Installation & training	Complete onsite installation and training				
Others	Company having a track record of providing CAD/CAM solutions to industries				

25	Plasma Spray Unit	Purpose	This atmospheric plasma spray system should be capable of depositing Hydroxyapatite and/or titanium coatings onto biomedical implants including total hip replacement and total knee replacement implants.	01
		Control Unit	PLC unit to control all process	
			Communication Interface	
		Operating Terminal	PC controlled terminal with window 10 based graphical user interface in the form of a software.	
		Plasma Gun	Power 50 KW or above	
			Compatible Plasma Gun	
		Plasma Power Supply	Current = upto 1000 A or higher	
			Continuous operation power = 50 kW or higher	
			Ignition unit for plasma system	
		Mass flow controller	Gases (x3)	
			Powder (x1)	
		Gas Regulators and cylinders	Adequate controllers with builtin safety and pressure tested cylinders with certificates	
			Argon (2 stage regulator x1 and cylinder x2)	
			Hydrogen (2 stage regulator x1 and cylinder x2)	
			Nitrogen (2 stage regulator x1 and cylinder x2)	
Helium (2 stage regulator x1 and cylinder x2)				
Powder Feeder				
Powder feeder unit	High precision wear and maintenance free powder feed system for all typical thermal spray powders including powder flow sensor and hosing suitable to layout.			
Powder Hopper volume (litres)	2.5 (or more)			
Other Features				
Water Cooling System	Compatible water cooling system			

		Electrical Distributor including breakers and switches	Suitable breakers and power distribution cabinet and wiring.		
		Accessories	All requisite accessories to perform aforementioned functions as intended including gauges, valves, hosing, regulators, gas cylinders, computer system with software etc. must be included		
		Computer	As recommended by OEM with power backup and 24 inch screen		
		Powders (Coating grade)	▪ 2 kilograms – Titanium powder ▪ 2 kilograms – Hydroxyapatite powder		
		Warranty and Company profile	12 months or more from date of installation (including service and parts) and technical support from local company and OEM for coatings development and troubleshooting.		
			OEM should have experience of developing hydroxyapatite coatings on metal implants		
		Installation and training	Complete on-site installation, demonstration and training (multiple runs) of quality-adherent hydroxyapatite coatings on metals		
26	Electrochemical Power supply with tank	Purpose	Electrochemical Power supply for anodizing of biomedical implants	01	
		General features	Programmable electrochemical power supply		
		Modes	Constant Voltage mode (Max Load regulation = 0.02% of voltage)		
			Constant Current Mode (Max Load regulation = 0.02% of current)		
		Output voltages (V)	Minimum = 0		
			Maximum = 200 (or higher)		
			Readback Accuracy 0.07 % or better		
			Resolution 0.015 % or better		

		Output current (A)	Minimum = 0			
			Maximum = 15 (or higher)			
		Power (kW)	5 or better			
		Display	Digital display for different information			
		Accessories	Acid and temperature resistant tanks suitable for anodization			04
		UPS (online with dry batteries)	As recommended by OEM			01
		Computer	AS recommended by OEM with power backup and 24 inch screen			01
		Installation and Training	Onsite installation and training			
		Warranty	12 months or more from the date of installation (parts and services)			
27	Vacuum Packing Unit	Purpose	To pack medical devices	01		
		Seal Dimensions	<ul style="list-style-type: none"> • Seal Lengths: 8, 11, 16 inches or better • Seal Widths: 1/4, 3/8 inches or higher 			
		Vacuum and flow	<ul style="list-style-type: none"> • Vacuum pressure upto 26 in Hg standards or better • suction flow 1.3 SCFM or better 			
		Materials used	Stainless Steel Enclosure			
		Operating mode	5 or more Selectable modes			
		Display	Digital			
		UPS backup	As recommended by OEM			
		Installation & training	Complete onsite installation and training			
		Warranty & Others	12 Months from the date of installation (parts and service)			
28	Surgical light for OT	Purpose	Surgical light source to illuminate the Operating area. Facilitation in surgical procedures for animal trials. Compact exam light for surgical procedures on experimental animals.	02		
		Light source	LED			
		Light intensity	≥ 80,000 LUX			
		Features	Adjustable height	02		
		accessories	Spare Bulb			
		Installation	Complete onsite installation			
Warranty	12 Months or more from the date of installation (parts and Service)					

29	Operating Table	Purpose	Operating Table for surgical procedures on small and medium sized animals. Made of Stainless steel. Imported or Locally manufactured	02	
		Tabletop dimensions (inch)	50 x 24 or higher.		
		Adjustable Height	Table height Hydraulically adjustable		
		Heated Top	Durable stainless steel tabletop with electronic heating system or Or Heating pad should be provided		
		Drain hole	Built-in drain hole at the table top		
		Load capacity	120 kg or more		
		Warranty	12 Months or more from the date of installation (parts and Service)		
30	Low-Flow Anesthesia System	Purpose	Anesthesia system for delivery of anesthetic to prepare small animals for surgical procedures.	02	
		Tidal volume	25 ml or less 1L or more		
		Number of animals	Single or multi		
		Working pressure	0.3 MPa		
		Oxygen flush	30 L/min or more		
		Accessories	All the required hardware and connections included in the system		
		Warranty	12 Months or more from the date of installation (parts and Service)		
31	Trolley with inbuilt Rabbit cages	Trolleys	<ul style="list-style-type: none"> • Mild steel with powder coating (Blue color) • made up of angle 20mm x 20mm • Gauge Thickness 16 Swg 	08 trolleys	
			Four castor wheels of size 4 inches must be provided.		
			Each trolley must can accommodate 03 rabbit cages each size of 600mm x 450mm x 450 mm		
			Trolley must have feature of attaching the second		

			trolley by special type of locking system provided. These add on can be continued till N numbers the user wishes			
		Rabbit Cages	Cages size: 600mm x 450mm x 450 mm (LXBXH)	24 cages		
			Made of S.S 304 material with duly spot welded and finished joints			
			AISI 304 quality stainless steel material			
			Fitted with tag holder			
			Gap between S.S mesh with 7mm spacing Design to ensure perfect fit and locking throughout the complete cage body			
			Cage door has a fixed label holder and arrangement for food hopper and fixing water bottle.			
			The door must be made of wire mesh of 2.5mm and 5mm SS rod welded on a frame of 5mm SS rod and covered with 22 swg Sheet.			
			Floor grill Bottom floor net of 12 x 26 mm must be made of 2.5mm and 5mm SS wire welded on a frame of 5mm SS rod. Floor net must be fixed and non-removable type.			
			Tray Excreta tray made of 22swg S.S sheet with turned and smoothed edges, and removable for cleaning.			
		Bottles	Water Bottles Polypropylene water bottle of capacity 650ml fitted S.S bent type nozzle	24 Bottles		
32	Anesthesia Mask/Breathing Circuit	General Feature	Rodent face masks made from clear acrylic to anesthetize or resuscitate the rodents.	04		
		Size	Large anesthesia mask with co-axial non-rebreathing system			
			44mm diameter			
			38mm deep			
Diaphragm	Includes extra diaphragm material (200g or more).					

33	Inverted Microscope	Purpose	Microscope for observing and recording images of surfaces and microstructures of metals and ceramics	
		General features	Inverted microscope with following observation methods <ul style="list-style-type: none"> • Bright field • Dark field • Differential Interference Contrast • Polarized Light 	01
		Objectives compatible for all optical options	4x or 5x	01
			10x	01
			20x	01
			50 x or 60x	01
			100x	01
		Eye Piece	10 × zoom	01 set
			15x or higher	01 set
		Illumination	LED	02
		Stages	Right-handed stage with Vernier calibration	
		Condenser	Universal	
		Camera	Compatible with microscope having 5 megapixels or better	01
			CCD based sensor for detection of high-quality images	
			Sensor size =1 inch or better	
			Recordable pixels All pixels = 2748 x 2200 or better	
			Live display mode = All pixels (2748 x 2200)@ 7.5 fps or better	
			Exposure time 0.06 msec to 1000 sec or better	
			Interface: USB 3.0 (connect with PC) with software	
		Computer system with software for live imaging	As recommended by OEM with 24 inch or higher screen with UPS	01
Computer system with software for post image processing	As recommended by OEM with 24 inch or higher screen with UPS	01		
Installation & training	Complete onsite installation and training			
Power Backup	As recommended by OEM with dry batteries			
Warranty & Others	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) with vendor having good local 			

			reputation with running machines and well-trained engineers • Proofs of trainings of company Personnel/engineers should be provided		
34	5 axis CNC machining Center (With tooled up package requirement)	Purpose	4+1 or pure 5 axis Capable of machining sophisticated parts including biomedical metallic implants Capable of machining 316L and Ti-6Al-4V materials Capable of producing bone fixation plates and hip stems should come with all suitable attachments and accessories With CE marked declaration	01	
		X/Y/Z travel in mm	350/300/250 or better		
		Rotary Table diameter (mm)	250 or better		
		Maximum weight on table (kg)	50 (or more)		
		Tilting A-axis (degree)	+110/-20 or better range		
		Rotary C-axis (degree)	360		
		Controller	FANUC 0iM or equivalent or better		
		Main spindle speed (rpm)	10000 (or more)		
		tool length (mm)	250 (or better)		
		Tool fitting standards	BT40/DIN69871/CAT40/HSK A63		
		Rapid Traverse X/Y/Z (m/min)	30/30/24 or better		
		Tool magazine and ATC (Nos)	24 or better		
		Maximum speed	A-axis (rpm) 25 or better		
			C-axis (rpm) 25 or better		
Position Accuracy (mm)	± 0.008				

Signature & Stamp of Bidder

	Repeat Accuracy (mm)	± 0.006	
	Lubrication	Auto lubrication with low lubrication fault	
	Standard Accessories	High pressure chip flush system	01
		Chip Conveyor	01
		Spindle oil cooler & Heat exchanger	01
		pressure coolant through spindle (20 bar or better)	01 set
		Connectivity through ethernet, RS232 port	
		Lamp	
		cycle finish alarm	
	Software and Programmer	Post processor for CAD to NC conversion and Machine definitions LCD display with USB port and PC/MICA Card	
	Voltage Stabilizer	As recommended by OEM	
	Machine installation and implants trial production	Machine should be tooled up along with necessary tooling for manufacturing of bone plates and total hip replacement stems. Vendor must provide installation, commissioning, training which include trial manufacturing of basic parts at installation site in CUI, Lahore. Local company should have established setup and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required) Proof of facilities to handle troubleshooting of machine.	

			2 end user certificates from satisfied customers in Pakistan must be provided		
		Warranty & Service	Warranty: Minimum period of 1 year including service and parts		
34.1	5 axis CNC machining Center (Without tooling package requirement)	Purpose	4+1 or pure 5 axis Capable of machining sophisticated parts including biomedical metallic implants Capable of machining 316L and Ti-6Al-4V materials Capable of producing bone fixation plates and hip stems should come with all suitable attachments and accessories With CE marked declaration	01	
		X/Y/Z travel in mm	350/300/250 or better		
		Rotary Table diameter (mm)	250 or better		
		Maximum weight on table (kg)	50 (or more)		
		Tilting A-axis (degree)	+110/-20 or better range		
		Rotary C-axis (degree)	360		
		Controller	FANUC 0iM or equivalent or better		
		Main spindle speed (rpm)	10000 (or more)		
		tool length (mm)	250 (or better)		
		Tool fitting standards	BT40/DIN69871/CAT40/HSK A63		
		Rapid Traverse X/Y/Z (m/min)	30/30/24 or better		
		Tool magazine and ATC (Nos)	24 or better		
		Maximum speed	A-axis (rpm) 25 or better		
			C-axis (rpm) 25 or better		

	Position Accuracy (mm)	± 0.008	
	Repeat Accuracy (mm)	± 0.006	
	Lubrication	Auto lubrication with low lubrication fault	
	Standard Accessories	High pressure chip flush system	01
		Chip Conveyor	01
		Spindle oil cooler & Heat exchanger	01
		pressure coolant through spindle (20 bar or better)	01 set
		Connectivity through ethernet, RS232 port	
		Lamp	
		cycle finish alarm	
	Software and Programmer	Post processor for CAD to NC conversion and Machine definitions LCD display with USB port and PC/MICA Card	
	Voltage Stabilizer	As recommended by OEM	
	Machine installation and implants trial production	<ul style="list-style-type: none"> • Vendor must provide installation, commissioning, training which include trial manufacturing of basic parts at installation site in CUI, Lahore. • Local company should have established setup and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required) • Proof of facilities to handle troubleshooting of machine. • 2 end user certificates from satisfied customers in Pakistan must be provided 	
	Warranty & Service	Warranty: Minimum period of 1 year including service and parts	

Bid Evaluation Criteria

All bids shall be evaluated in accordance with the following evaluation criteria and other terms & conditions set forth in this bidding document.

- a. The bids shall be evaluated to strictly ensure that the quoted brand/ model meet all the BoQ/ specification requirements given in the tender document for each item.
- b. In addition to the BoQ requirements, vendors must meet the vendor qualification criteria /company profile requirements (if any), as set forth in this tender document.
- c. Supporting literature of the quoted model must be attached for verification & technical evaluation of the required specification by the technical committee. In case of any clash is found between the quoted model and the supported literature may lead to rejection of bid.
- d. The vendor must have an **authorized dealer certificate against all items except Sr. # 2, 9, 9.1, 12, 13, 14, 15, 18, 18.1, 20, 21, 22, 23, 28, 29, 30, 31, 32 of the quoted product/Item (Certificate with current year's validity)** of Original Manufacturer for all Equipment which shall be also verifiable from the Principal / Manufacture Website or through email. It must be attached with bid otherwise such item/bid may be rejected.

Financial Portion (Price and Brand/Model to be mention only in Financial Proposal in a separate sealed envelope) Strictly on our BoOs Form.

Vendors are required to provide both unit and total price of each item and calculations must be made carefully to avoid mistakes. However, in case, total price does not match with the unit price and quantity due to calculation error or typo error, any of the following can be opted

1. The bid may be rejected on the reason of ambiguity (OR)
2. Unit price will be considered as final and total price of the respective item will be calculated by multiplying it with the quantity required. Sub-totals and grand total will also be corrected accordingly.

No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).

Prices should be quoted inclusive of all applicable taxes

Sr. #	Equipment Name	Required Specifications		Qty	Quoted Model / Brand / Make	Unit Price (Rs)	Total Price (Rs)
1	Ultrasonic Bath	Purpose of Ultrasonic Bath	For ultra-sonication in analytical, industrial and medical applications, including intensive cleaning	03			
		Material	Stainless Steel				
		Frequency range (kHz)	Variable frequency				
		Timer	Must be present				
		Temp. range (°C)	Up to 80 °C				
		Ultrasonic Power (W)	100 or higher				
		Control Mode	Digital				
		Capacity (L)	5 or more				
		Accessories	Basket	03			
			Cover	03			
		Installation	Complete onsite installation				
Warranty	12 Months or more from the date of installation (parts and service)						
2	Dosing Pumps	General Requirements	Type: Diaphragm PTFE	05			
			All parts which come into liquid contact should be acid, alkali, solvent resistant				
			self-priming, maintenance free				
		Flow Parameters	Adjustable flow rate				
			Variable flow rates				
		Tubing	maximum flow rate to be between 75-200 ml/min				
			10 feet or more Acid, alkali and solvent resistant tube with all requisite connectors				
Installation	Complete onsite installation						

		Warranty & Others	12 Months or more from the date of installation (parts and service)				
3	-20 °C Freezer	Type	Upright Type	02			
		Chemical resistance	Yes				
		Variable temperature range (°C)	-8 (or higher) to -25 (or lower)				
		Exterior Material	Steel				
		Effective capacity	300 L or higher	02			
		Display temperature	Digital display				
		Voltage Stabilizer	As recommended by OEM				
		Installation	Complete onsite installation				
Warranty	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) • 5 years compressor warranty 						
3.1	-20 °C Freezer	Type	Upright Type	03			
		Chemical resistance	Yes				
		Temperature required	-20 or lower				
		Exterior Material	Steel				
		Effective capacity	300 L or higher	03			
		Display temperature	Digital display				
		Voltage Stabilizer	As recommended by OEM				
		Installation	Complete onsite installation				
Warranty	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) • 5 years compressor warranty 						
4	Vacuum Pump	Purpose of the Vacuum pump	Vacuum pump for routine laboratory work with Vacuum/pressure gauge	03			
		Construction	Oil Free Vacuum Pump				
		Vacuum attainable	60 torr or higher				
		Installation	Complete onsite installation				
		Warranty & Others	12 Months or more from the date of installation (parts and service)				
5		Purpose	A 3D Camera/Scanner for scanning of objects as 3D	01			

3D Camera		feed models for 3D printers, with USB supported interface				
	Camera resolution	1.3 MP or higher				
	Scanning Volume	100 mm (or higher) * 100 mm (or higher) * 75 mm (or higher)				
	Accuracy	15 µm or better				
	Interface	USB 3.0				
	Output format	Must include .obj, .stl,				
	Software	For image acquisition and analysis				
	Computer	Core i5 or better, licensed windows 10, 16GB RAM, 500 GB or higher SSD hard-disk, Dedicated Graphics card 2 GB or higher (must be compatible with the 3D Scanner), with power backup (UPS)	01			
	Accessories	Scanner stand, bracket, turntable, requisite cables and all accessories which are essential	-			
	Installation	Complete onsite installation				
Warranty	12 Months or more from the date of installation (parts and service)					
6 Syringe Pumps	Purpose	Syringe pump for Fabrication of electrospun matts and electrospaying of solutions for specifically biomedical applications	03			
	General features	single channel syringe pumps for electrospinning, able to work under high voltages (up to 50kv) with digital display				
	Syringe pump	Channels		Single channel pumps with controllable flow rate. May have ability to load multi syringes		
		Working temperature		5-40 °C (or better range)		
		Pumping rate		Digitally controlled variable pumping rate		
		Pump rate accuracy : +/- 2%				
Accessories	Needle sets 11 g to 27 g	03 or more				

		computer	Compatible with machine for data logging with 24 inch or bigger screen	03				
		Installation & training	Complete onsite installation and training					
		Warranty	12 Months or more from the date of installation (parts and service)					
6.1	Syringe pump	Purpose	Syringe pump for Fabrication of electrospun mats and electrospaying of solutions for specifically biomedical applications	01				
		General features	Two channel syringe pumps for electrospinning, able to work under high voltages (up to 50kv) with digital display					
		Syringe pump	Channels		Two-channel pump: can be controlled independently for individual syringe Flow rate, volume and time of infusion can be controlled precisely. Compatible to work under high voltage.			
			Working temperature		5-40 °C (or better range)			
			Pumping rate		Digitally controlled variable pumping rate			
			Pump rate accuracy		: +/- 2%			
		Accessories	Needle sets		11 g to 27 g	01		
			coaxial needle set		01			
		Computer	Compatible with machine for data logging with 24 inch or bigger screen	01				
		Installation & training	Complete onsite installation and training					
Warranty	12 Months or more from the date of installation (parts and service)							
7	Flow Pumps	General features	<ul style="list-style-type: none"> ▪ Type: Peristaltic ▪ Variable-Speed ▪ Graphical LCD display ▪ Reversible motor with on/off/reverse possibility 	01				
		Key Components	<p>Complete Digital system Containing:</p> <ul style="list-style-type: none"> ▪ Variable-Speed Pump drive ▪ Multiple pump heads 					

			<ul style="list-style-type: none"> ▪ Tubing ▪ Pump head Mounting Hardware 			
		Pump Drive and Head	Variable-Speed Digital Drive with pump head having flow rate range 5 ml/min (or lower) to 2800ml/min: (or higher)	1		
		Speed Resolution	01 rpm			
		Flow Tubing Set (20-25 feet length)	Provide Flow rate 1 or lower to 450 ml/min or higher	1		
			Provide Flow rate 50 or lower to 2000ml/min or higher	1		
		Installation	Complete onsite installation			
		Warranty & Others	12 Months or more from the date of installation (parts and service)			
7.1	Flow Pumps	General features	<ul style="list-style-type: none"> ▪ Type: Peristaltic ▪ Variable-Speed ▪ Graphical LCD display ▪ Reversible motor with on/off/reverse possibility 	1		
		Key Components	Complete Digital system Containing: <ul style="list-style-type: none"> ▪ Variable-Speed Pump drive ▪ Multiple pump heads ▪ Tubing ▪ Pump head Mounting Hardware 			
		Pump drive and head	Variable-Speed Digital Drive with pump head having flow rate range 1 ml/min (or lower) to 480ml/min or higher	1		
		Speed resolution	0.1 rpm			
		Flow Tubing	<ul style="list-style-type: none"> • Provide Flow rate 10 or lower to 200 ml/min or better • Can bear pressure minimum 2 bar or higher 	20-25 feet each		
			Provide Flow rate 0.5 or lower to 150 ml/min or higher			
		Installation	Complete onsite installation			

		Warranty & Others	12 Months or more from the date of installation (parts and service)				
8	Safety Cabinet	Purpose	CE certified Total exhaust cabinets for work with toxic chemicals and infectious agents	03			
		Class	II				
		Type	B2				
		Internal size (mm)	Width =1100 or more Depth =550 or more Height = 550 or more				
		Filter	HEPA/ULPA				
		control	<ul style="list-style-type: none"> • Graphical LCD display • on/off fan control with adjustable air velocity • Working window control • LED lamp ON/OFF • UV lamp ON/OFF • Elapsed time counter and alarm for HEPA filter replacement 				
		Chamber Materials	Stainless Steel				
		Window	Tempered glass				
		Other features	<ul style="list-style-type: none"> ▪ Compatible trolley ▪ UV light 				
		UPS backup	As recommended by OEM				
		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months or more from the date of installation (parts and service)				
9	Blue LED Lights	Purpose	Curing of dental composites using LED UV irradiation	03			
		General features	<ul style="list-style-type: none"> ▪ Rechargeable ▪ Wireless useability ▪ Base-charger with hand piece holder 				
		Wavelength (nm)	Any value between (380-520)				
		Power	1250 mW/cm² or better				
		Accessories	extra tips	06			
			extra battery	03			
Warranty	12 Months or more from the date of installation (parts and service)						
9.1	Blue LED Curing Unit	Purpose of the LED Spot Curing System	UV spot curing	01			
		General features	UV light system for spot curing having four independent channels				

	(UV LCD Curing Unit)	LED Heads	<ul style="list-style-type: none"> • 365 nm • 385 nm • 395 nm • 405 nm 				
		Spot Size	5 mm (or less) to 15 mm (or more)				
		UV Intensity (variable)	Upto 13 W/cm ² or better				
		Display	Digital display for operations				
		Accessories	Radiometer and calibration kit				
			Protective gear				
			Extra set of LED head (01 each)				
		Installation & Training	Complete installation and all standard accessories with onsite training				
Warranty	12 months or more from the date of installation (parts and service)						
10	High Speed mixer	Purpose	High speed mixer is proposed to blend and grind a range of materials (ceramics, polymer etc)	01			
		Motor	70 Watts (or more)				
		Adjustable speeds	0-6000 rpm (or more)				
		Capacity	0.5 L (or less) to 5 L (or more)				
		Other features	automatic shutoff				
		Assemblies (stainless steel)	assembly for 0.5 L (or lower) to 1L (or more)				
			assembly for 2 L (or lower) to 3 L (or more)				
			Assembly for 4 l (or lower) to 5 L (or more)				
		Accessories	Emulsification Shear Stator				
Emergency stop button with timer							
Installation & training	Installation and on-site training						
Warranty and Others	12 Months or more from the date of installation (parts and service)						
11	Precision Cutting Machine	Purpose	Precision cutting machine for cutting of metals, ceramic and polymers.	01			
		Cutter features	The unit is capable of precision cutting of samples under gravity (manual cut off). Equipped with replaceable wearing plates including all the necessary				

			<p>clamping devices, cut off liquid and user manuals.</p> <p>Cutting Capacity: minimum dia 25 mm with x-axis adjustment of minimum 25 mm</p> <p>working wheel (replaceable): upto150 mm (or higher)</p> <p>Vertical movement: Sample movement through Gravity</p> <p>Variable Speed: minimum 300 rpm (or lower) to 1000 rpm (or higher)</p>				
		Accessories	Sample vise universal	2			
			Set of flanges	1			
			Oil for precision cutting (litre)	5			
			Diamond Cutt off wheels: Dia150 x thickness 0.40 mm 05 blades in one pack	1 pack			
		Sample mounting press	<p>Automated Hydraulic press for mounting of cutting samples with digital control for heating time, molding temperature, ramp control and start & stop cycle programming</p> <ul style="list-style-type: none"> ▪ Temperature 200°C (or higher) ▪ Adjustable Heating and Colling time ▪ Pressure 250 bar (or higher) ▪ Any two Mold sizes in between 25-50mm 	01			
		Power backup with additional Servo Stabilizer	As recommended by OEM	01			
		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months or more from the date of installation (parts and service)				
12	Bone Hand piece straight	Purpose	A dental handpiece is a hand-held, a mechanical instrument used to perform a variety of common dental procedures, oral surgery and altering prostheses	01			
		Body	1:1 straight				
			Titanium body or better quality				
			Clean Head System				

			Autoclavable up to 120°C				
		Application	For Bone or oral Surgery				
		Rotation	Up to 40000 RPM or more				
		Features	External Irrigation				
		Extra-Long burs	50 mm or adequate for microsurgery				
		Installation	Complete onsite installation				
		Warranty	12 Months or more from the date of installation (parts and service)				
13	Dental Chair	Purpose	A complete dental unit for dental patient treatment	01			
		Dental Chair	Computer control motorized chair.				
			One touch pre-set memory				
			One touch zero return system.				
			Multicontrol Foot switch for chair.				
			Up/down and back/forward movements				
			Double articulating Head rest adjustable for neck positioning				
			Emergency stoppage switch				
			Air cylinder stable to stand any position.				
		Tray	3 hand pieces				
			Individual air pressure controls				
			One 3-way syringe for doctor with quick disconnect tip for autoclave.				
			X-Ray Viewer				
			Water flow control				
		Cuspidor Unit	Single Unit Porcelain Spittoon and Cup filler removable and autoclaveable	1			
			-Rotatable assistant Arm				
			High volume evacuator (air operated)				
			Water operated Saliva ejector				
		Junction Box	Air and Water supply lines with filters				
		Suction Machine	Suction motor rotation speed: 3000 rpm or higher				
		Ultrasonic Scalar Built-in Kit	Tips with holders	3			
Autoclaveable hand piece	1						
Autoclavable complete kit	1						

		Air Turbine	High speed air turbine (Push Type 4 hole)	1			
			Low speed air turbine with Contra angle hand piece attachment (key type 4 hole)	1			
		Installation & training	Complete onsite installation and training				
		Warranty	12 Months or more from the date of installation (parts and service)				
14	Compressor	Purpose	<ul style="list-style-type: none"> Oil free single stage compressor with air storage tank suitable for high quality air demand for medical applications 	01			
		Power	4kW (or higher)				
		Pressure	10 bar (or higher)				
		Receiver/air tank (litre)	270 (or higher)				
		pumping Capacity (litre)	350 (or higher)				
		Installation	Complete onsite installation				
		Warranty	12 Months or more from the date of installation (parts and service)				
15	Crucible	General Features	<ul style="list-style-type: none"> Purity Level: Pt \geq 99.95% Volumetric Capacity: 5 mL 	01			
			<ul style="list-style-type: none"> Purity Level: Pt \geq 99.95% Volumetric Capacity: 20 mL 	01			
		Quality	Purity certificate must be provided				
16	3D printer (FDM)	Purpose	Open Source printer for additive manufacturing of high-quality polymer and composite structures	02			
		build volume (cm)	22x15x15 or larger				
		Dual extrusion	Able to print with two different materials at a time				
		Layer Thickness (micron)	≤ 100				
		Build Platform	<ul style="list-style-type: none"> Heated platform to temperature ≥ 100 °C Aluminum or glass materials 				
		Nozzle temperature	<ul style="list-style-type: none"> ≥ 180 °C 				

		Filaments	▪ Filament needed – PLA, ABS, PCL (1 Kg each)				
		Nozzel Diameter (mm)	0.3 to 0.5 (Any value in this range)				
		Filament extruder and winder	<ul style="list-style-type: none"> • Can extrude filaments from composites • Should be compatible with the provided 3D printer 				
		Softwares	<ul style="list-style-type: none"> • System supporting softwares • should support STL files 				
		Computer	Compatible with machine for data logging with 24 inch or bigger screen				
		Power back up	as recommended by OEM for optimum operations				
		Installation & training	Complete onsite installation and training				
		Warranty	12 Months or more from the date of installation (parts and service)				
17	Thermal cycler	Purpose	For amplification of DNA using polymerase chain reaction	01			
		Capacity	96-well x 0.2 ml tubes				
		Temp. Range	4°C (or below) to 99.9°C (or higher)				
		Temp Accuracy	±0.5°C or better				
		Temperature Gradient zones	3 or more				
		Display option	LCD display				
		Heating rate	Heating: 3.0°C /sec or more Cooling: 3.0°C /sec or more				
		Temperature uniformity	≤0.5°C				
		Installation & training	Complete onsite installation and training				
		Warranty	12 Months or more warranty from the date of installation (Parts and services)				
18	Liquid nitrogen tank	Liquid nitrogen supply tank	Tank made of stainless steel For safe supply and storage of liquid nitrogen	01			
		Capacity	100 Liters or more				
		Tanks rating	22 psi or better				
		Accessories	Cylindrical roller base Cylinder hand truck with wheels				
			4 ft. flexible braided stainless-steel transfer hose or better LN2 fill phase separator				

			Temperature Sensor Pressure gauge Liquid nitrogen level indicator First Safety valve Second Safety valve Fill and withdraw valve Solenoid valve Pressure building valve				
		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months or more from the date of installation (parts and service)				
18.1	Liquid nitrogen tank	Liquid nitrogen tank for cell storage	CE certified Tank made of For safe storage of cells	01			
		Capacity	30 liters (or more)				
		Vial capacity (1.2-2 mL)	600 (or more)				
		Evaporation rate	0.2 litres/ day (or lower)				
		Accessories	Vial rack	04			
			2 ml cryo-vial box	10			
			1 ml cryo-vial box	10			
	0.5 ml cryo-vial box	5					
Warranty & Others	12 Months or more from the date of installation (parts and service)						
19	CNC Laser Cutting Machine	Purpose	The laser system should be capable of high accuracy laser marking (metals & non-metals) and laser cutting (soft materials). The capability to perform desired function can be achieved by a single system or two independent systems meeting the specifications				
		Laser Cutting	Laser power (W)	150 (or higher)	01		
	Laser source		CO ₂				
	Laser focus		Auto				
	Working area (mm x mm)		1300 (or higher) x900 (or higher)				
	Position accuracy		±0.05 mm or better				
	Smallest achievable feature		1x1 mm (or lower)				
	Connectivity	Computer with software and 24 inch					
With additional laser marking requirement							

				or better screen				
			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats				
		Laser Marking	Laser Power (W)	50 or better	01			
			Laster Type	Fiber				
			Marking depth (mm)	0.1 (or higher)				
			Working Area (mm)	100 x 100 (or higher)				
			Working accuracy (mm)	0.01 or better				
			Smallest achievable feature (mm)	0.2 or better				
			Operation	Computer with software and 24 inch or better screen				
			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats				
		Power backup	Suitable power back up for the system. In case two separate systems are provided then two separate backups are required					
		Installation & training	Complete onsite installation and training					
		Warranty & Others	12 Months or more from the date of installation (parts and service)					
19.1	CNC Laser Cutting Machine (Without	Purpose	The laser system should be capable of high accuracy laser cutting.					
		Laser Cutting	Laser power (W)	150 (or higher)	01			
			Laser source	CO ₂				
			Laser focus	Auto				

	additional laser marking requirement)		Working area (mm x mm)	1300 (or higher) x900 (or higher)				
			Position accuracy	±0.05 mm or better				
			Smallest achievable feature	1x1 mm (or lower)				
			Connectivity	Computer with software and 24 inch or better screen				
			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats				
		Power backup	As recommended by OEM					
		Installation & training	Complete onsite installation and training					
		Warranty & Others	12 Months or more from the date of installation (parts and service)					
20	Drill Machine	General Features	<ul style="list-style-type: none"> Benchtop Drill machine with digital system to read drilling speed and depth Keyless precision chuck Adjustable speed (RPM) Adjustable drilling height Multi gear Laser pointing system for precision drilling 		01			
		Drilling capacity in mild steel	13 mm (or higher)					
		Drill stroke	90 mm or better					
		Power in put	700 Watt (or higher)					
		Installation & training	Complete onsite installation and training					
		Warranty & Others	12 Months or more from the date of installation (parts and service)					
21	Centrifugal Grinder	Bench grinder	<ul style="list-style-type: none"> eye shields, spark deflectors, tool rests, adjusting wrench Overload Protection Tool-Free Adjustable Guard 		01			

			<ul style="list-style-type: none"> • 3/4 hp induction motor or higher power • 3,600 rpm or higher • wheel guards • 12 inch or more distance between wheels for larger and longer grinding applications 				
		Accessories	Grinding wheel coarse (40-60 grit)	01			
			Grinding wheel fine (100-150 grit)	01			
		Angle grinder	General features <ul style="list-style-type: none"> • Power: 800 watts (or above) • Cutting Wheel Size: 100 mm or equivalent • Speed: 10,000 rpm (or higher) • Cable length : 2 meter (or more) • Body Grip tool for firm hold • Lock on switch for continuous use • Complete with all accessories 	01			
		Installation	Complete onsite installation				
		Warranty and others	12 months or more from the date of installation (parts and services)				
22	Arc welder	General Features	Multi-purpose <ul style="list-style-type: none"> • Manual/Stick • TIG • Should be able to weld Stainless Steel, Steel, Aluminum • Display screen 	01			
		Stick Welding Output	180 A (230 V) @ 25% duty cycle or better				
		TIG Welding Output	180 A (230 V) @ 30% duty cycle or better				
		Accessories	All requisite accessories to perform aforementioned tasks as highlighted in General Features should be provided (which includes but may not be limited to torches, regulators, gas cylinder)				
		Class of Protection	IP21S or better				

		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months or more from the date of installation (parts and services)				
23	Manual & Power Tool and Consumables	Workstations	6 feet or more length of Workstation for tool storage and tabletop for day to day work	1			
			30,000 cu. inch or more capacity load				
			2 feet or more professional working depth				
			Workstation should be equipped with 15 or more, ball-bearing drawers that hold up to 100 lbs. or above with 200 lbs. or above capacity in the deeper drawers.				
			<ul style="list-style-type: none"> • Powdered coated Steel Body • Thick 18 Gauge or better 				
		Auto Return Drawers					
		Mixed Tool SET	<ul style="list-style-type: none"> ▪ 400 or more pieces ▪ Blow molded durable carry case ▪ Meets or exceeds ANSI specifications ▪ Chrome-molybdenum steel according to SAE and MM standards 	1 complete set			
			<p>Should include but not necessarily be limited to;</p> <ul style="list-style-type: none"> ▪ Utility Knife, ▪ 5m/16ft Tape Measure ▪ Screw drivers (different types) ▪ Adjustable Wrenches ▪ Hex. Key wrenches ▪ Pipe Wrench ▪ Pliers ▪ Dr. Specialty bits, sockets ▪ Hammers ▪ Extension Bar 				
		Brushless Cordless Drill & Impact Driver Kit	18v Brushless 3/8 in. drill and impact driver	01			
			<ul style="list-style-type: none"> ▪ High speed transmission with 2 or more speed settings ▪ With LED lights to illuminate the work surface 				

		<ul style="list-style-type: none"> ▪ Compact, lightweight design for tight spaces ▪ 2 extra batteries for drill as well as impact driver & charger ▪ Wide range of drill bits (hard coated & wear resistant) 				
		12 Months or more warranty from the date of installation (parts and services)				
	Brushless Hammer drill	Integrated lithium ion Battery	01			
		Torque: 1,220 in-lbs				
		Variable speed				
		2 extra Lithium Ion Batteries				
		Charger				
		Power 36V				
		Brad Point Drill & Masonry Bits (tungsten carbide tips)				
		Screws / Fasteners				
		HSS Drill Bits				
		Magnetic Bit Tip Holder				
		1" Bits, 2" Bits, 3-1/2" Bits				
		Nut drivers				
		Ratcheting Screwdriver				
		Gauge				
		Sockets				
		Socket Adaptor				
	Storage box					
	12 Months or more warranty from the date of installation (parts and services)					
	Hammer Drill (Corded)	2-position switch to select standard or hammer drill functions	01			
		6.5 Amp or more power				
		Quick-change chucks – changing bits must be fast and tool-free				
		Working mode: Hammer drilling, Drilling, Chiseling				
		3000rpm				
		Single-sleeved chuck for easy bit changes				
		Multi-position side handle for ease of use				
		1/2 in. chuck to accommodate larger bits along with associated bits				

			12 Months or more warranty from the date of installation (parts and services)					
		Chop Saw	<ul style="list-style-type: none"> ▪ To cut through metal ▪ 15 A or more 14 in. (or more) Chop Saw to cut	01				
				12 Months or more warranty from the date of installation (parts and services)				
		Multipurpose Bench Vice	Jaw width 5-6-inch Jaw with Swivel Base	01				
			Opening capacity 5 inch or more					
			Throat depth 2 inches or more					
			Captured safety jaw to prevent slide from falling out					
			Fused steel handle					
			Anvil incorporated					
			Integrated pipe jaws					
			12 Months or more warranty from the date of installation (parts and services)					
24	CAD licensed software	CAD/CAM/CAE software License	software suite for computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE),	01				
			<ul style="list-style-type: none"> • Multiuser • Educational/startup/incubator 					
			CAM Machining software	Design Module	01			
				Lathe/ Swiss Lathe module				
				Milling 3d module including 4 axis rotary				
				Art module				
				Wire EDM Module				
				ProDrill Module				
				True Shape Nesting Functionality				
				Rast2Vec Functionality				
				Router 3D Module				
		Data translations (including but not limited to): ASCII,						

			<p>CADL, DWG, DXF, EPS, IGES, Inventor (IPT, IDW, IAM), Key Creator (CKD), Parasolids, Rhino 3DM, SOLIDWORKS (SLDPRT, SLDASM, SLDDRW), SAT (ACIS Solids), Solid Edge (PAR & PSM), SpaceClaim (SCDOC), STEP, STL, VDA</p> <p>Life time license</p>				
		Computer	Workstation should be provided with specs to support aforementioned softwares. should include original windows with SSD hard disc, adequate graphics card and 24 inch screen	01			
		Installation & training	Complete onsite installation and training				
		Others	Company having a track record of providing CAD/CAM solutions to industries				
25	Plasma Spray Unit	Purpose	This atmospheric plasma spray system should be capable of depositing Hydroxyapatite and/or titanium coatings onto biomedical implants including total hip replacement and total knee replacement implants.	01			
		Control Unit	PLC unit to control all process				
			Communication Interface				
		Operating Terminal	PC controlled terminal with window 10 based graphical user interface in the form of a software.				
		Plasma Gun	Power 50 KW or above Compatible Plasma Gun				
		Plasma Power Supply	Current = upto 1000 A or higher				
			Continuous operation power = 50 kW or higher				
			Ignition unit for plasma system				
		Mass flow controller	Gases (x3) Powder (x1)				
		Gas Regulators and cylinders	Adequate controllers with builtin safety and pressure tested cylinders with certificates				

			Argon (2 stage regulator x1 and cylinder x2)			
			Hydrogen (2 stage regulator x1 and cylinder x2)			
			Nitrogen (2 stage regulator x1 and cylinder x2)			
			Helium (2 stage regulator x1 and cylinder x2)			
		Powder Feeder				
		Powder feeder unit	High precision wear and maintenance free powder feed system for all typical thermal spray powders including powder flow sensor and hosing suitable to layout.			
		Powder Hopper volume (litres)	2.5 (or more)			
		Other Features				
		Water Cooling System	Compatible water cooling system			
		Electrical Distributor including breakers and switches	Suitable breakers and power distribution cabinet and wiring.			
		Accessories	All requisite accessories to perform aforementioned functions as intended including gauges, valves, hosing, regulators, gas cylinders, computer system with software etc. must be included			
		Computer	As recommended by OEM with power backup and 24 inch screen			
		Powders (Coating grade)	▪ 2 kilograms – Titanium powder ▪ 2 kilograms – Hydroxyapatite powder			
		Warranty and Company profile	12 months or more from date of installation (including service and parts) and technical support from local company and OEM for coatings development and troubleshooting.			
			OEM should have experience of developing hydroxyapatite coatings on metal implants			
		Installation and training	Complete on-site installation, demonstration and training (multiple runs) of quality-adherent			

			hydroxyapatite coatings on metals				
26	Electrochemical Power supply with tank	Purpose	Electrochemical Power supply for anodizing of biomedical implants	01			
		General features	Programmable electrochemical power supply				
		Modes	Constant Voltage mode (Max Load regulation = 0.02% of voltage)				
			Constant Current Mode (Max Load regulation = 0.02% of current)				
		Output voltages (V)	Minimum = 0				
			Maximum = 200 (or higher)				
			Readback Accuracy 0.07 % or better				
		Output current (A)	Resolution 0.015 % or better				
			Minimum = 0				
		Power (kW)	Maximum = 15 (or higher)				
			5 or better				
		Display	Digital display for different information				
		Accessories	Acid and temperature resistant tanks suitable for anodization	04			
		UPS (online with dry batteries)	As recommended by OEM	01			
Computer	AS recommended by OEM with power backup and 24 inch screen	01					
Installation and Training	Onsite installation and training						
Warranty	12 months or more from the date of installation (parts and services)						
27	Vacuum Packing Unit	Purpose	To pack medical devices	01			
		Seal Dimensions	<ul style="list-style-type: none"> • Seal Lengths: 8, 11, 16 inches or better • Seal Widths: 1/4, 3/8 inches or higher 				

		Vacuum and flow	<ul style="list-style-type: none"> • Vacuum pressure upto 26 in Hg standards or better • suction flow 1.3 SCFM or better 				
		Materials used	Stainless Steel Enclosure				
		Operating mode	5 or more Selectable modes				
		Display	Digital				
		UPS backup	As recommended by OEM				
		Installation & training	Complete onsite installation and training				
		Warranty & Others	12 Months from the date of installation (parts and service)				
28	Surgical light for OT	Purpose	Surgical light source to illuminate the Operating area. Facilitation in surgical procedures for animal trials. Compact exam light for surgical procedures on experimental animals.	02			
		Light source	LED				
		Light intensity	≥ 80,000 LUX				
		Features	Adjustable height				
		accessories	Spare Bulb	02			
		Installation	Complete onsite installation				
		Warranty	12 Months or more from the date of installation (parts and Service)				
29	Operating Table	Purpose	Operating Table for surgical procedures on small and medium sized animals. Made of Stainless steel. Imported or Locally manufactured	02			
		Tabletop dimensions (inch)	50 x 24 or higher.				
		Adjustable Height	Table height Hydraulically adjustable				
		Heated Top	Durable stainless steel tabletop with electronic heating system or Or Heating pad should be provided				
		Drain hole	Built-in drain hole at the table top				

		Load capacity	120 kg or more					
		Warranty	12 Months or more from the date of installation (parts and Service)					
30	Low-Flow Anesthesia System	Purpose	Anesthesia system for delivery of anesthetic to prepare small animals for surgical procedures.	2				
		Tidal volume	25 ml or less 1L or more					
		Number of animals	Single or multi					
		Working pressure	0.3 MPa					
		Oxygen flush	30 L/min or more					
		Accessories	All the required hardware and connections included in the system					
		Warranty	12 Months or more from the date of installation (parts and Service)					
31	Trolley with inbuilt Rabbit cages	Trolleys	<ul style="list-style-type: none"> • Mild steel with powder coating (Blue color) • made up of angle 20mm x 20mm • Gauge Thickness 16 Swg 	08 trolleys				
			Four castor wheels of size 4 inches must be provided.					
			Each trolley must can accommodate 03 rabbit cages each size of 600mm x 450mm x 450 mm					
			Trolley must have feature of attaching the second trolley by special type of locking system provided. These add on can be continued till N numbers the user wishes					
		Rabbit Cages	Cages size: 600mm x 450mm x 450 mm (LXBXH)	24 cages				
			Made of S.S 304 material with duly spot welded and finished joints					
			AISI 304 quality stainless steel material					
			Fitted with tag holder					
			Gap between S.S mesh with 7mm spacing					

			Design to ensure perfect fit and locking throughout the complete cage body			
			Cage door has a fixed label holder and arrangement for food hopper and fixing water bottle.			
			The door must be made of wire mesh of 2.5mm and 5mm SS rod welded on a frame of 5mm SS rod and covered with 22 swg Sheet.			
			Floor grill Bottom floor net of 12 x 26 mm must be made of 2.5mm and 5mm SS wire welded on a frame of 5mm SS rod. Floor net must be fixed and non-removable type.			
			Tray Excreta tray made of 22swg S.S sheet with turned and smoothed edges, and removable for cleaning.			
		Bottles	Water Bottles Polypropylene water bottle of capacity 650ml fitted S.S bent type nozzle	24 Bottles		
32	Anesthesia Mask/ Breathing Circuit	General Feature	Rodent face masks made from clear acrylic to anesthetize or resuscitate the rodents.	04		
		Size	Large anesthesia mask with co-axial non-rebreathing system			
			44mm diameter			
			38mm deep			
Diaphragm	Includes extra diaphragm material (200g or more).					
33	Inverted Microscope	Purpose	Microscope for observing and recording images of surfaces and microstructures of metals and ceramics			
		General features	Inverted microscope with following observation methods <ul style="list-style-type: none"> ● Bright field ● Dark field ● Differential Interference Contrast ● Polarized Light 	01		
			4x or 5x	01		
			10x	01		

		Objectives compatible for all optical options	20x	01			
			50 x or 60x	01			
			100x	01			
		Eye Piece	10 × zoom	01 set			
			15x or higher	01 set			
		Illumination	LED	02			
		Stages	Right-handed stage with Vernier calibration				
		Condenser	Universal				
		Camera	Compatible with microscope having 5 megapixels or better	01			
			CCD based sensor for detection of high-quality images				
			Sensor size =1 inch or better				
			Recordable pixels All pixels = 2748 x 2200 or better				
			Live display mode = All pixels (2748 x 2200)@ 7.5 fps or better				
			Exposure time 0.06 msec to 1000 sec or better				
			Interface: USB 3.0 (connect with PC) with software				
Computer system with software for live imaging	As recommended by OEM with 24 inch or higher screen with UPS	01					
Computer system with software for post image processing	As recommended by OEM with 24 inch or higher screen with UPS	01					
Installation & training	Complete onsite installation and training						
Power Backup	As recommended by OEM with dry batteries						
Warranty & Others	<ul style="list-style-type: none"> • 12 Months or more from the date of installation (parts and service) with vendor having good local reputation with running machines and well-trained engineers • Proofs of trainings of company Personnel/engineers should be provided 						

34	5 axis CNC machining Center (With tooled up package requirement)	Purpose	4+1 or pure 5 axis Capable of machining sophisticated parts including biomedical metallic implants Capable of machining 316L and Ti-6Al-4V materials Capable of producing bone fixation plates and hip stems should come with all suitable attachments and accessories With CE marked declaration	01			
		X/Y/Z travel in mm	350/300/250 or better				
		Rotary Table diameter (mm)	250 or better				
		Maximum weight on table (kg)	50 (or more)				
		Tilting A-axis (degree)	+110/-20 or better range				
		Rotary C-axis (degree)	360				
		Controller	FANUC 0iM or equivalent or better				
		Main spindle speed (rpm)	10000 (or more)				
		tool length (mm)	250 (or better)				
		Tool fitting standards	BT40/DIN69871/CAT40/HS K A63				
		Rapid Traverse X/Y/Z (m/min)	30/30/24 or better				
		Tool magazine and ATC (Nos)	24 or better				
		Maximum speed	A-axis (rpm) 25 or better C-axis (rpm) 25 or better				
		Position Accuracy (mm)	± 0.008				
		Repeat Accuracy (mm)	± 0.006				
		Lubrication	Auto lubrication with low lubrication fault				
		Standard Accessories	High pressure chip flush system	01			
			Chip Conveyor	01			
			Spindle oil cooler & Heat exchanger	01			
			pressure coolant through spindle (20 bar or better)	01 set			
	Connectivity through ethernet, RS232 port						

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			Lamp			
			cycle finish alarm			
		Software and Programmer	Post processor for CAD to NC conversion and Machine definitions LCD display with USB port and PCMICA Card			
		Voltage Stabilizer	As recommended by OEM			
		Machine installation and implants trial production	Machine should be tooled up along with necessary tooling for manufacturing of bone plates and total hip replacement stems. Vendor must provide installation, commissioning, training which include trial manufacturing of basic parts at installation site in CUI, Lahore. Local company should have established setup and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required) Proof of facilities to handle troubleshooting of machine. 2 end user certificates from satisfied customers in Pakistan must be provided			
		Warranty & Service	Warranty: Minimum period of 1 year including service and parts			
34.1	5 axis CNC machining Center (Without tooled up package requirement)	Purpose	4+1 or pure 5 axis Capable of machining sophisticated parts including biomedical metallic implants Capable of machining 316L and Ti-6Al-4V materials Capable of producing bone fixation plates and hip stems should come with all suitable attachments and accessories With CE marked declaration	01		
		X/Y/Z travel in mm	350/300/250 or better			
		Rotary Table diameter (mm)	250 or better			

	Maximum weight on table (kg)	50 (or more)			
	Tilting A-axis (degree)	+110/-20 or better range			
	Rotary C-axis (degree)	360			
	Controller	FANUC 0iM or equivalent or better			
	Main spindle speed (rpm)	10000 (or more)			
	tool length (mm)	250 (or better)			
	Tool fitting standards	BT40/DIN69871/CAT40/HS K A63			
	Rapid Traverse X/Y/Z (m/min)	30/30/24 or better			
	Tool magazine and ATC (Nos)	24 or better			
	Maximum speed	A-axis (rpm) 25 or better			
		C-axis (rpm) 25 or better			
	Position Accuracy (mm)	± 0.008			
	Repeat Accuracy (mm)	± 0.006			
	Lubrication	Auto lubrication with low lubrication fault			
	Standard Accessories	High pressure chip flush system	01		
		Chip Conveyor	01		
		Spindle oil cooler & Heat exchanger	01		
		pressure coolant through spindle (20 bar or better)	01 set		
		Connectivity through ethernet, RS232 port			
		Lamp			
		cycle finish alarm			
	Software and Programmer	Post processor for CAD to NC conversion and Machine definitions LCD display with USB port and PC/MICA Card			
	Voltage Stabilizer	As recommended by OEM			
	Machine installation and implants trial production	<ul style="list-style-type: none"> Vendor must provide installation, commissioning, training which include trial manufacturing of basic parts at installation site in CUI, Lahore. Local company should have established setup 			

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			<p>and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required)</p> <ul style="list-style-type: none"> • Proof of facilities to handle troubleshooting of machine. • 2 end user certificates from satisfied customers in Pakistan must be provided 				
		Warranty & Service	Warranty: Minimum period of 1 year including service and parts				

Special Terms and conditions:

- i. Please submit the technical and financial bid (rates) on our prescribed BoQs Form and clearly mention the quoted model / brands, with complete terms and conditions signed, stamped with both bids, otherwise your bid (s) may be rejected.
- ii. Item at Sr. # 19 includes an additional laser marking requirement and item at Sr. # 19.1 excludes this option, only one of these options will be selected based on budget provisions.
- iii. Item at Sr. # 34 includes a tooled up package requirement and items at Sr. # 34.1 excludes this option, only one of these options will be selected based on budget provisions.
- iv. Lowest Vendor are required to provide the samples against the Sr. # 31 i.e. (Trolley with inbuilt Rabbit cages) before the bulk supply.
- v. Vendor will be responsible for Installation & Commissioning of the delivered equipment's.
- vi. Purchase / work order (s) will be awarded on **Item wise Basis.**
- vii. Kindly attach the **Tender fee with Technical Bid and Bid money / CDR with Financial Bid.**
- viii. **Multiple rates of an item may also lead to the rejection of bid / item.**