



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

Tender No. CUI-LHR-TN-13-20-1367

Case # 3052

Single Stage Two Envelop Procedure

Title of Tender: **Lab Equipment for Establishment of Centre for Advanced Technologies in Biomedical Materials (Knowledge Economy Initiative)**

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/delivery time for is **120 Days (starting from the date of LC Opening)**. The handing over / completion time for this contract is of critical importance.
8. The bid proposal must be quoted inclusive of all freight and packing charges in C&F and to be delivered at Lahore Airport. CUI Lahore Campus shall open the direct LC in favor of Original Manufacturer / Principal and shall also clear the shipment from Custom Authorities.
9. After opening of bids, CUI-Lahore Campus will examine the bids for completeness as per tender document.
10. Purchase order (s) will be awarded to the lowest or technically recommended bidder (s) on the basis of item wise / subtotal wise / grand total wise according to the nature of BoQs.
11. The bid should be submitted in a sealed envelope up to **May 14, 2020** on or before **1100hrs** and will be opened on the same date **at 1130hrs** in the presence of available bidders.
12. 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**;
 - ii. The envelopes shall be marked as **“FINANCIAL PROPOSAL”** and **“TECHNICAL PROPOSAL”** in bold and legible letters to avoid confusion;

Signature & Stamp of Bidder

- 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.
13. 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
14. The envelope shall also bear the word **“CONFIDENTIAL”** and following identification quotation of **“Lab Equipment for Establishment of Centre for Advanced Technologies in Biomedical Materials (Knowledge Economy Initiative)”**.
15. The bid form (BoQs) must be duly filled in, stamped and signed by the authorized representative of the bidder.
- 16. 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.
17. 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.
18. Deduction of Income Tax and any other tax will be deducted at source according to Government prevailing rules.

- 19. 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.
- 20. 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.
- 21. It is the sole responsibility of the agent / supplier / manufacturer to comply with the applicable laws, be national or international.
- 22. In case of any dispute or grievance, the matter shall be addressed as per PPRA rules.
- 23. The CUI-Lahore Campus reserves the right to modify the quantities of goods / services at any time before the award of purchase / work order.
- 24. Warranty as mentioned in BoQs shall be provided from the date of installation or standard warranty whichever is higher.
- 25. The Successful/lowest bidder is required to submit the **05% of the total value of Purchase Order as a retention money in form of Call Deposit Receipt/ Local Bank Guarantee with the validity of Warranty Time Period (As mentioned in BoQs)** in favor of COMSATS University Islamabad (CUI), Lahore Campus and it will be released after the completion of warranty period.
- 26. **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”.**
- 27. **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.
- 28. 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.
- 29. 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.**

Signature & Stamp of Bidder

BoQs of Lab Equipment for Establishment of Centre for Advanced Technologies in Biomedical Materials (Knowledge Economy Initiative)

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).			Please mention the quoted Model / Brand with meeting the all specifications mentioned in BoQs				
Sr. #	Item Name	Required Specifications					
Item Wise Basis (Sr. # 1 to 7)							
01	Confocal Microscope	General Features	<ul style="list-style-type: none"> • Confocal laser scanning microscope • Capability for Surface Topography • Live imaging system 	01			
		Microscope	Inverted microscope with DIC				
			Fluorescence system: LED source for Red, Green, Blue, and UV				
		Stage	Motorized stage-scanning				
			Stage type			X-Y axis: motorized and control through software	
						Z axis resolution: 30 nm or better	
			Motorized auto Focus/definite/adaptive system				
		Stage size: (should be able to hold standard well plate, 25-mm × 75-mm slides, 35-mm, 60-mm dishes, microtiter plates and coverslips					
		Objective	Apochromat 10x or better water based			01	
			Apochromat 20x or better water based			01	
			Apochromat 40x or better oil based			01	
			Apochromat 60x or 63 or better oil based			01	
			Apochromat 100x oil based			01	
			All other essential accessories required for objectives & objectives which are essential to perform the desired functions				
		Illumination	Diode laser: 405nm				
Diode laser: 488nm							
Diode laser: 561±10 nm							
Diode laser 640 ±10 nm							
Confocal Detectors	3 Channels detector						
	PMT detectors		02				
	GaAsP PMT detector		01				
Fluorescence Detector	PMT detector						

	Spectral Detector	Minimum 03 parallel simultaneous detection channels	
	Spectral Range	400 nm (or less) to 720 nm (or more)	
	Scanners	Galvanometric scanners or resonant scanner	
	Pinhole	Adjustable pinhole with automatic mode	
	Beam path	Motorized Beam splitter for maximum lasers	
	Software	Latest software to run the machine	
		Suitable software to run and program the machine for live imaging, image acquisition, post processing, 3D visualization and data analysis	
		Lifetime license	
		Deconvolution Module	
		Colocalization Module	
		Multi-Channel module	
		Measurement Module	
		Image Analysis Module	
		Time Lapse Module	
		Z Stack Module	
		Extended Focus Module	
		Upgradable	
		Multi User license	
	Incubator for live cell imaging	Full incubator	01
		Suitable for live cell imaging	
		Temperature control	
		Humidity control	
		CO₂ control	
	Camera	Monochrome sCMOS	01
		4 mega pixel or better	
		Sensor with cooling technology	
	Computer System	suitable to run the machine and should be Provided by OEM	
	Accessories	Vibration control table (provided by OEM)	
		power supplies	
		Mounting Kit	01
		Immersion Oil	100 mL
		CO₂ cylinder with 2 stage regulator	01
	UPS	As recommended by OEM	
	Training	Comprehensive training including air travel, boarding and lodging at OEM site	
	Warranty and others	<ul style="list-style-type: none"> 12 Months warranty from the date of installation (parts and service) with vendor having good local reputation with running 	

			<p>machines and well- trained engineers</p> <ul style="list-style-type: none"> • Proofs of trainings of company personnel/engineers should be provided • List of installations in Pakistan 		
02	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	<ul style="list-style-type: none"> ▪ PLC unit to control all process ▪ Communication Interface ▪ Remote access for diagnostics 		
		Operating Terminal	<ul style="list-style-type: none"> ▪ PC controlled terminal with window 10 based graphical user interface in the form of a software. ▪ Database of plasma sprayed biomedical coating recipes ▪ Data management system with real time data recording, visualization and analysis 		
		Plasma Gun	Compatible DC Plasma Gun for Air Plasma System		
		Plasma Power Supply	Current Range = 1000 A or better		
			Continuous operation power = 100 kW or better		
			Accuracy of DC supply = \pm 1% or better		
			Electrical Efficiency = 90% or better		
			Ignition unit for plasma system with solid gun hose connection box		
		Gas Regulation system			
		Gas Regulators	<p>Gas regulators for plasma system including gas controller with dynamic pressure compensation. Suitable controllers for;</p> <ul style="list-style-type: none"> ▪ Argon ▪ Hydrogen ▪ Nitrogen ▪ Helium 		
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.				
Minimum feed range (g/min)	5 (or less)				

		Maximum Feed (g/min)	60 (or more)		
		Powder Hopper volume (litres)	2.5 (or more)		
		Other Features			
		Water Cooling System	35 kW or better		
		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		
		Powders (Coating grade)	<ul style="list-style-type: none"> ▪ 2 kilograms – Titanium powder ▪ 2 kilograms – Hydroxyapatite powder 		
		Warranty and Company profile	<ul style="list-style-type: none"> ▪ 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 ▪ Local company should have a strong background in thermal spray coatings (installation and services) in Pakistan. A list of installations should be provided. ▪ Proof of trainings and qualifications of engineers of the local company should also be provided 		
		Training & Commissioning	<ul style="list-style-type: none"> ▪ Comprehensive training including air travel, boarding and lodging on plasma spray system and development of hydroxyapatite coatings at manufacturer site ▪ Complete on-site installation and demonstration (multiple runs) of quality-adherent hydroxyapatite coatings on metals 		
		Documentation	<ul style="list-style-type: none"> ▪ All necessary brochures, letters of authorization and certificates to support all the aforementioned 		

			requirements of the end-user must be included		
03	Universal Testing Machine	Purpose of the Universal Testing Machine	<ul style="list-style-type: none"> Tabletop/floor standing electromechanical universal testing machine capable of testing metals, ceramic and polymers under static uniaxial testing (tension & compression) complete with all accessories and grips including power backup. Accuracy of the machine should be according to ISO7500-1 and ISO9513 	01	
		Load Cell	±100 KN with Valid calibration Certificate ISO17025 (calibration certificate required)		
		Crosshead Speed (mm/min)	0.0005 (or lower) to 500 (or higher)		
		Test area height between crosshead and lower platen	1500 mm (or higher)		
		Testing area height between connecting adaptors	0-1300 mm or better		
		Test Area Width	600 mm or higher		
		Testing Mode	Tension, Compression, Bending		
		Grips	<ul style="list-style-type: none"> Universal Wedge Grip (100KN) with suitable insets for Round and Flat samples Max. Specimen Diameter = 30 mm or better Max Specimen Thickness = 25mm or better Max. Specimen Width = 40 mm or better Height of Inset = 50mm or better Jaws for flat sample = 0-20 mm thickness or better Jaws for round sample = 2mm – 24 mm or better 	1	
	<ul style="list-style-type: none"> Wedge Screw Grips up to 10 kN Suitable to hold polymeric, wires, wood samples and composite samples 	1			

			<ul style="list-style-type: none"> ▪ Compression plates suitable for 100 kN 	1	
		Extensometer	<ul style="list-style-type: none"> ▪ Axial Extensometer clip on gauges for flat and round sample Type 3542 or equivalent. ▪ Gauge Length: 10 mm ▪ Measuring Strain= +80%, -10% ▪ Flat sample Range = up to 12 mm x 31 mm or better ▪ Round Sample Diameter = upto 25 mm or better 	1	
			<ul style="list-style-type: none"> ▪ Axial Extensometer clip on gauges for flat and round sample Type 3542 or equivalent. ▪ Gauge Length: 50 mm ▪ Measuring Strain= +80%, -10% ▪ Flat sample Range = up to 12 mm x 31 mm or better ▪ Round Sample Diameter = upto 25 mm or better 	1	
		Software	<ul style="list-style-type: none"> ▪ Complete software with programming option for tailoring the test based on need. ▪ Multiple sequences and program and profile saving options. ▪ Auto machine stiffness calculation and data correction. ▪ Fully licensed and free upgradeable 		
		Workstation	Suitable workstation as recommended and endorsed by OEM		
		Power backup	As recommended by OEM with proof of the recommendation by the OEM		
		Warranty & Others	<ul style="list-style-type: none"> ▪ Minimum period of 1 year including service and parts and training at installation site ▪ Company must have a track record of supplying mechanical testing equipment in Pakistan with a list of installations provided 		
04	Screen Printer	Purpose	To print disposable screen printed electrode on various substrates with variety of printing material	1	
		General features	<ul style="list-style-type: none"> ● Automatic feeder with touch control panel ● Static eliminator ● Auto registration for printing ● Auto delivery ● CCD camera 		
		Printing area (mm)	300*400 or better		

		Printing speed-stroke (mm/s)	300 or better	
		Screen frame thickness (mm)	25 or better	
		Off-contact-standby height (mm)	10 or better	
		Squeegee-coater speed (mm/sec.)	10 (or lower) to 300 (or higher)	
		Alignment precision	0.02 mm or better	
		Other Features	Machine body is powder coating.	
			corrosion and rust resistant printing table	
			Emergency button	
			Motor controlled in 3 axis movement	
		Accessories	Printing screens of different patterns and sizes (patterns and sizes would be provided later by the end user)	05
			Squeegee holders of three different sizes) compatible to the model)	02
			Flood coater of two different sizes compatible to the model	02
			Silver paste	50 g
			Graphite paste	1 kg
		Power backup	As recommended by OEM for optimum operations	
		Warranty & Others	<ul style="list-style-type: none"> ● 12 Months warranty 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 ● List of installations in Pakistan ● Training (at installation site) and installation 	

05	Microarray Scanner	Purpose of Micro Array Scanner	To use biomaterials induced gene expressions in cells and animal models	01
		Applications	for use in functional biology, cellomics, gene expression and drug discovery research.	
		Scan Time	15 minutes or less	
		Laser source	1. 532nm±10 2. 635±10	
		Laser channels	2 or more	
		Sample type	Standard Microscope Slide/Glass Slide	
		Detector	Photomultiplier (PMT) minimum 1	
		Maximum Scan Area	20 x 70 mm or better	
		Maximum Resolution	2.5 microns or better	
		Fluorophore	Cy3, Cy5, Alexa555, Alexa 647, Alexa 660, including suitable filter for these dyes	
		UPS	as recommended by OEM	
		Computer	Computer with licensed image analysis software with power backup	
		Trining	Comprehensive training including air travel, boarding and lodging at OEM site	
Warranty	<ul style="list-style-type: none"> ● 12 Months warranty 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 ● List of installations in Pakistan ● Training (at installation site) and installation 			

06	Inverted Microscope	Purpose	Inverted microscope suited for investigation of live cells, fixed cells and bacteria.	
		General features	<ul style="list-style-type: none"> Trinocular inverted microscope with bright field, phase contrast and camera having antifungal optical system. Should have capability to upgrade into a fluorescent microscope. 	04
		Objectives	4x	01 each
			10x	
			20x	
			40x	
		Adjustable Eye Piece	10 × zoom	02 pairs
			20 X zoom	02 pairs
		Stage	The stage should be capable of handling cell culture flasks (T75 Flask) Petri dish and well plates.	01
			Movement 126 (or higher)*78 mm (or higher)	
			Auxiliary stage attachable	
			Universal holder	
			Slide holder	
			Teraski holder	
		Illumination	High luminescent white LED light	
			Accepts 2 filters	
Heat absorbing filter and diffuser				
Extra long working distance (ELWD) condenser				
Focusing	Vertical objective movement			
	Via nosepiece up/down movement			
	Coarse stroke: 37.7 mm per rotation or better sensitivity (could be more or less up to 2.5 mm)			
	Fine stroke 0.2 mm per rotation (or lower)			
Camera	Compatible with microscope having 5 megapixels or better	01		
	CMOS based sensor for detection of high-quality images			
	CMOS sensor size =1/1.8 inch or better			
	Recordable pixels All pixels = 2880 x 2048 or better			
	Selectable ISO Range = 50 - 3200 or better			
	Live display mode = All pixels (2880 x 2048): 15 fps or better			

			Exposure time 100 μ sec (or lower) to 30 sec (or better)		
			Interface: USB3.0 (connect with PC), External trigger along with software		
		Computer system for camera	As recommended by OEM	01	
		Training	On spot training (installation site)		
		Warranty and 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 ▪ List of microscope installations in Pakistan and end user satisfaction certificate/s should be provided 		
6.1	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 \times zoom	01 set	
			15x or higher	01 set	
		Illumination	LED Illuminator		
		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					

			<p>Live display mode = All pixels (2748 x 2200)@ 7.5 fps or better</p> <p>Exposure time 0.06 msec to 1000 sec or better</p> <p>Interface: USB 3.0 (connect with PC) with software</p>		
		Computer system for camera	As recommended by OEM	01	
		Installation and Training	Complete installation and Installation site training		
		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 • List of microscope installations in Pakistan and end user satisfaction certificate/s should be provided 		
7	Precision Cutting Machine	Purpose	<ul style="list-style-type: none"> ▪ Precision cutting of samples with 3D automated moment controllable with programming PLC ▪ Replaceable wearing plates including all the necessary clamping devices, cutting liquid and as well as mounting press to ease the holding of delicate samples. ▪ All necessary documentation along with power backup. 		
		General features	<p>Variable speed 100 (or lower) to 4000 (or higher) rpm</p> <p>Working wheel diameter (replaceable): 150 mm (or more)</p> <p>Cutting diameter = 75 mm (or more)</p> <p>Fully automatic XYZ axis X = 60 mm or more Y = 210 mm or more Z = 45 mm or more X-axis resolution = 0.016 mm or better</p> <p>Adjustable table feed rate = 10 – 1000 µm/sec or better</p> <p>Fully programable with LED based GUI interface</p> <p>Thin section grinding feature</p>	1	

			Laser based positioning	
			Digital display with PLC for automated cutting	
			Recirculating cooling system	
		Accessories	Stand for specimen Vises	2
			Universal Specimen Vise	2
			Vise for Biomedical Samples	2
			Diamond Cut-Off Wheels: Dia. 125 x thickness 0.38mm	5 blades
			Diamond Cut-off wheels: Dia. 150 x thickness 0.40 mm	5 blades
			Abrasive Cut-off wheels 0.25 mm x 200 mm	25 wheels
			Blade dressing unit during grinding	1
			Dressing medium	10
			Mounting medium (phenolic resin)	5 kg
			Oil for precision cutting	10 liters
		Sample mounting press	Automated Hydraulic press 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) ▪ Pressure 300 bar (or higher) ▪ Any two Mold sizes in between 25-50mm 	01
		Power backup with additional Servo Stabilizer	As recommended by OEM	01
		Warranty & Others	<ul style="list-style-type: none"> ▪ 12 Months 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 ▪ List of installations in Pakistan should be provided 	

Sub Total Basis (Sr. # 8 to 11)

8	Swiss Turn CNC Double Head machining center	Purpose	<ul style="list-style-type: none"> • Capable of machining sophisticated parts including dental implants and bone screws. • Capable of machining 316L and Ti-6Al-4V materials • With double head, tools and cooling unit including all accessories for dental implant manufacturing 		01
		Swiss Turn CNC	Turning Diameter Main Spindle (mm)	20 or better	
			Sub spindle turning diameter (mm)	20 or better	
			Turning Length rotation (mm)	190/250 or better	
			Turning Length non bush in mm	50 or better	
			Turning Length Fixed bush (mm)	280/220 or better	
			Main Spindle Drilling/tapping capacity (mm)	Φ10/M8 or better	
			Sub Spindle Drilling/tapping capacity (mm)	Φ8/M8 or better	
			Cross Drilling/tapping (mm)	Φ8/M6 or better	
		Tooling	Number of outer dia. Tool Holder (pcs) ~ 12mm	6 or better	
			Number of internal dia. tool holder (pcs) ~ Φ22mm	4 or better	
			Spindle-1 Cross Live Tool Holder – Er-16 (pcs)	5 or better	
			Sub Spindle Face Live Tool Holder (pcs)	8 or better	
			Control Axis (with c-axis) pcs	8 or better	
			Main/sub spindle bore dia (mm)	26 or better	
	Main/sub spindle speed (rpm)	10000/8000 or better			

	Movements and Rotation	X1/Z1/Y1/X2/Z2/Y2 Rapid Traverse (m/min)	24 or better
		Spindle-1 cross drilling maximum speed (rpm)	8000 or better
		Spindle-2 face drilling maximum speed (rpm)	8000 or better
		Controller	FANUC 32i or equivalent or better
	Power and Lubrication	Power Requirement	25 KVA (or lower)
		Lubrication Capacity in Liter	2 (or higher)
	Accessories	Cooling Tank Capacity in liter	200 (or higher)
		High pressure coolant system 70 bar with sub coolant tank and cutting oil cooler	01 set
		External Tool holder (6 tools)	01 set
		Internal tool holder (4 tools)	01 set
		Side drilling tool holder (5 tools)	01 set
		Complete Whirling Threading Unit with inserts and insert holders	01 set
		Parts catcher	1
		Parts conveyer	1
		Tools and toolbox	1 set
		Lighting Device	1
		Rotary guide bushing holder 190 mm stroke or better	1
		Spindle servo motor	1
		Main spindle c-axis	1
		Cutting coolant and inspection	1
Cut-off inspection	1		

			Sub spindle and sub spindle c-axis	1	
			Sub spindle tool holder for 8 position milling & drilling	1	
			Stationary tool holder (sub spindle)	1	
			Power tool holder ER16	1	
			Chuck Gripper	1	
			Hexagonal Punching tool holder	1	
			Guide bush and safety lock	1	
			Non guide bush holder	1	
			Spindle Collet	1	
			ER 16 M2 inner tools holders	1	
			ER 16 collet set	1	
			3 position OD tool holder sub spindle	1	
			Deep Hole drilling device	1	
			Y2-axis	1	
			Chip conveyer & cart	1	
			Operational & maintenance manual in English	1 Set	
			Voltage Stabilizer As recommended by OEM		
		Machine installation and dental implants trial production	Machine should be tooled up along with tooling and program to manufacture 3 components of dental implants as per attached drawing		
			Vendor should supply dental implants samples before shipment and provide installation, commissioning, training which include manufacturing of dental implant ((as per drawing available at Page # 47 to 49) by maker's engineers 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), along with facilities to handle troubleshooting.		

			2 end user certificates from satisfied customers in Pakistan must be provided		
			Warranty: Minimum period of 1 year including service and parts		
			Comprehensive training including air travel, boarding and lodging at OEM site		
9	5 axis CNC machining Center	Purpose	<ul style="list-style-type: none"> ● 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	400/500/400 or better		
		Rotary Table diameter (mm)	300 or better		
		Maximum weight on table (kg)	100 (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)	15000 (or more)		
		tool length (mm)	300 (or more)		
		Tool fitting standards	BT40/DIN69871/CAT40/HSK A63		
		Rapid Traverse X/Y/Z (m/min)	48/48/48 or better		
		Tool magazine and ATC (Nos)	24 or better		
		Maximum speed	A-axis (rpm) 25 or better		
			C-axis (rpm) 25 or better		

		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	LCD touch 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 hip stems. Vendor must provide installation, commissioning, training which include manufacturing of bone plates by maker's engineers 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), along with facilities to handle troubleshooting. 2 end user certificates from satisfied customers in Pakistan must be provided		
		Warranty & Service	Warranty: Minimum period of 1 year including service and part		
10	Automatic CNC Lathe Machine	Purpose	<ul style="list-style-type: none"> • Capable of machining sophisticated parts including biomedical metallic implants. • Capable of machining 316L and Ti-6Al-4V materials. • Capable of producing round heads with precise curvature e.g. femoral heads and including suitable attachments and accessories 	01	
		Swing over bed (mm)	450 or better		
		Turning diameter (mm)	100 or better		
		Bar capacity (mm)	30 (or higher)		

	Turning length (mm)	100 or better	
	Stroke X/Z (mm)	140 or better	
	X/Z axis traverse (mm)	15 or better	
	Position Accuracy	0.008 mm or better	
	Main spindle speed (rpm)	6000 or better	
	Turret tools	8 (or more)	
	OD tool size (mm)	16	
	boring tool size (mm)	Φ20 (or larger)	
	Inner cutting sleeve (mm)	Φ8, 10mm & 12mm	
	c-axis	yes	
	3 position servo face live tool or better	Should be included	
	4 position servo cross live tool +Y axis	Should be included	
	Accessories		
	4" Jaw Chuck	01	
	Collet Chuck	01	
	Part Conveyer and part catcher	1 set	
	Heat exchanger	1	
	Coolant device with splash guard	01	
	Tools with tool box	01 set	
	Controller	FANUC Oi or equivalent or better	
	Voltage stabilizer	As Recommended by OEM	

		Machine installation	Local company should have established setup and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required), along with facilities to handle troubleshooting. 2 end user certificates from satisfied customers in Pakistan must be provided			
		Warranty	Minimum period of 1 year including service and parts			
11	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	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 should be included
			Supporting graphic formats			Corel draw, Autocad, photoshop and other widely used standard formats
			Troubleshooting	Remote access option		
		Laser Marking	Laser Power (W)	50 or better	01	
			Laster Type	Fiber		
			Marking depth (mm)	0.1 (or higher)		
			Working accuracy (mm)	0.01 or better		
			Smallest achievable feature (mm)	0.2 or better		

		operation	Computer with software should be included	
		Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats	
		Troubleshooting	Remote access option	
	Power back	Suitable power back up for the system. In case two separate systems are provided then two separate backups are required		
	Warra nty & Others	<ul style="list-style-type: none"> ▪ 12 Months 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 ▪ List of installations in Pakistan should be provided 		

Purchase Order against Sr. # 8 to 11 shall be issued on Sub Total Basis

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 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 BoQs Form.

<p>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</p> <ol style="list-style-type: none"> The bid may be rejected on the reason of ambiguity (OR) 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 to be quoted in C&F with all freight & packing charges at Lahore Airport			
Sr. #	Equipment Name	Required Specifications		Quoted Model / Brand	Unit Price (C&F Lahore Airport) with mentioning of Quoted Currency	Total Price (C&F Lahore Airport) with mentioning of Quoted Currency		
Item Wise Basis (Sr. # 1 to 7)								
01	Confocal Microscope	General Features	<ul style="list-style-type: none"> Confocal laser scanning microscope Capability for Surface Topography Live imaging system 		01			
		Microscope	Inverted microscope with DIC					
			Fluorescence system: LED source for Red, Green, Blue, and UV					
		Stage	Motorized stage-scanning					
			Stage type	X-Y axis: motorized and control through software				
				Z axis resolution: 30 nm or better				
			Motorized auto Focus/definite/adaptive system					
		Stage size: (should be able to hold standard well plate, 25-mm × 75-mm slides, 35-mm, 60-mm dishes, microtiter plates and coverslips						
		Objective	Apochromat 10x or better water based					01
			Apochromat 20x or better water based					01
			Apochromat 40x or better oil based					01
Apochromat 60x or 63 or better oil based			01					
Apochromat 100x oil based			01					
All other essential accessories required for objectives & objectives which are essential								

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			to perform the desired functions			
	Illumination		Diode laser: 405nm			
			Diode laser: 488nm			
			Diode laser: 561±10 nm			
			Diode laser 640 ±10 nm			
	Confocal Detectors		3 Channels detector			
			PMT detectors	02		
			GaAsP PMT detector	01		
	Fluorescence Detector		PMT detector			
	Spectral Detector		Minimum 03 parallel simultaneous detection channels			
	Spectral Range		400 nm (or less) to 720 nm (or more)			
	Scanners		Galvanometric scanners or resonant scanner			
	Pinhole		Adjustable pinhole with automatic mode			
	Beam path		Motorized Beam splitter for maximum lasers			
	Software		Latest software to run the machine			
			Suitable software to run and program the machine for live imaging, image acquisition, post processing, 3D visualization and data analysis			
			Lifetime license			
			Deconvolution Module			
			Colocalization Module			
			Multi-Channel module			
			Measurement Module			
			Image Analysis Module			
			Time Lapse Module			
			Z Stack Module			
			Extended Focus Module			
			Upgradable			
			Multi User license			
		Incubator for live cell imaging		Full incubator	01	
			Suitable for live cell imaging			
			Temperature control			
			Humidity control			
			CO₂ control			
			O₂ control			
	Camera		Monochrome sCMOS	01		
			4 mega pixel or better			
			Sensor with cooling technology			
	Computer System		suitable to run the machine and should be Provided by OEM			

			Vibration control table (provided by OEM)			
			power supplies			
		Accessories	Mounting Kit	01		
			Immersion Oil	100 mL		
			CO ₂ cylinder with 2 stage regulator	01		
			UPS	As recommended by OEM		
		Training	Comprehensive training including air travel, boarding and lodging at OEM site			
		Warranty and others	12 Months warranty 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 List of installations in Pakistan			
02	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	<ul style="list-style-type: none"> ▪ PLC unit to control all process ▪ Communication Interface ▪ Remote access for diagnostics 			
		Operating Terminal	<ul style="list-style-type: none"> ▪ PC controlled terminal with window 10 based graphical user interface in the form of a software. ▪ Database of plasma sprayed biomedical coating recipes ▪ Data management system with real time data recording, visualization and analysis 			
		Plasma Gun	Compatible DC Plasma Gun for Air Plasma System			
		Plasma Power Supply	Current Range = 1000 A or better			
			Continuous operation power = 100 kW or better			
Accuracy of DC supply =±1% or better						

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		Electrical Efficiency = 90% or better			
		Ignition unit for plasma system with solid gun hose connection box			
		Gas Regulation system			
	Gas Regulators	Gas regulators for plasma system including gas controller with dynamic pressure compensation. Suitable controllers for; <ul style="list-style-type: none"> ▪ Argon ▪ Hydrogen ▪ Nitrogen ▪ Helium 			
		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.			
	Minimum feed range (g/min)	5 (or less)			
	Maximum Feed (g/min)	60 (or more)			
	Powder Hopper volume (litres)	2.5 (or more)			
		Other Features			
	Water Cooling System	35 kW or better			
	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			
	Powders (Coating grade)	<ul style="list-style-type: none"> ▪ 2 kilograms – Titanium powder ▪ 2 kilograms – Hydroxyapatite powder 			

		<p>Warranty and Company profile</p>	<p>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.</p> <p>OEM should have experience of developing hydroxyapatite coatings on metal implants</p> <p>Local company should have a strong background in thermal spray coatings (installation and services) in Pakistan. A list of installations should be provided.</p> <p>Proof of trainings and qualifications of engineers of the local company should also be provided</p>				
		<p>Training & Commissioning</p>	<ul style="list-style-type: none"> ▪ Comprehensive training including air travel, boarding and lodging on plasma spray system and development of hydroxyapatite coatings at manufacturer site ▪ Complete on-site installation and demonstration (multiple runs) of quality-adherent hydroxyapatite coatings on metals 				
		<p>Documentation</p>	<p>All necessary brochures, letters of authorization and certificates to support all the aforementioned requirements of the end-user must be included</p>				
03	<p>Universal Testing Machine</p>	<p>Purpose of the Universal Testing Machine</p>	<ul style="list-style-type: none"> • Tabletop/floor standing electromechanical universal testing machine capable of testing metals, ceramic and polymers under static uniaxial testing (tension & compression) complete with all accessories and grips including power backup. • Accuracy of the machine should be according to ISO7500-1 and ISO9513 	01			
		<p>Load Cell</p>	<p>±100 KN with Valid calibration Certificate ISO17025 (calibration certificate required)</p>				

		Crosshead Speed (mm/min)	0.0005 (or lower) to 500 (or higher)			
		Test area height between crosshead and lower platen	1500 mm (or higher)			
		Testing area height between connecting adaptors	0-1300 mm or better			
		Test Area Width	600 mm or higher			
		Testing Mode	Tension, Compression, Bending			
		Grips	<ul style="list-style-type: none"> ▪ Universal Wedge Grip (100KN) with suitable insets for Round and Flat samples ▪ Max. Specimen Diameter = 30 mm or better ▪ Max Specimen Thickness = 25mm or better ▪ Max. Specimen Width = 40 mm or better ▪ Height of Inset = 50mm or better ▪ Jaws for flat sample = 0-20 mm thickness or better ▪ Jaws for round sample = 2mm – 24 mm or better 	1		
			<ul style="list-style-type: none"> ▪ Wedge Screw Grips up to 10 kN ▪ Suitable to hold polymeric, wires, wood samples and composite samples 	1		
			<ul style="list-style-type: none"> ▪ Compression plates suitable for 100 kN 	1		
		Extensometer	<ul style="list-style-type: none"> ▪ Axial Extensometer clip on gauges for flat and round sample Type 3542 or equivalent. ▪ Gauge Length: 10 mm ▪ Measuring Strain= +80%, -10% ▪ Flat sample Range = up to 12 mm x 31 mm or better ▪ Round Sample Diameter = upto 25 mm or better 	1		

			<ul style="list-style-type: none"> ▪ Axial Extensometer clip on gauges for flat and round sample Type 3542 or equivalent. ▪ Gauge Length: 50 mm ▪ Measuring Strain= +80%, -10% ▪ Flat sample Range = up to 12 mm x 31 mm or better ▪ Round Sample Diameter = upto 25 mm or better 	1			
		Software	<ul style="list-style-type: none"> ▪ Complete software with programming option for tailoring the test based on need. ▪ Multiple sequences and program and profile saving options. ▪ Auto machine stiffness calculation and data correction. ▪ Fully licensed and free upgradeable 				
		Workstation	Suitable workstation as recommended and endorsed by OEM				
		Power backup	As recommended by OEM with proof of the recommendation by the OEM				
		Warranty & Others	Minimum period of 1 year including service and parts and training at installation site Company must have a track record of supplying mechanical testing equipment in Pakistan with a list of installations provided				
04	Screen Printer	Purpose	To print disposable screen-printed electrode on various substrates with variety of printing material	1			
		General features	<ul style="list-style-type: none"> ● Automatic feeder with touch control panel ● Static eliminator ● Auto registration for printing ● Auto delivery ● CCD camera 				
		Printing area (mm)	300*400 or better				
		Printing speed-stroke (mm/s)	300 or better				

		Screen frame thickness (mm)	25 or better			
		Off-contact-standby height (mm)	10 or better			
		Squeegee-coater speed (mm/sec.)	10 (or lower) to 300 (or higher)			
		Alignment precision	0.02 mm or better			
		Other Features	Machine body is powder coating.			
			corrosion and rust resistant printing table			
			Emergency button			
			Motor controlled in 3 axis movement			
		Accessories	Printing screens of different patterns and sizes (patterns and sizes would be provided later by the end user)	05		
			Squeegee holders of three different sizes) compatible to the model)	02		
			Flood coater of two different sizes compatible to the model	02		
			Silver paste	50 g		
			Graphite paste	1 kg		
		Power backup	As recommended by OEM for optimum operations			
		Warranty & Others	12 Months warranty 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 List of installations in Pakistan Training (at installation site) and installation			

05	Microarray Scanner	Purpose of Micro Array Scanner	To use biomaterials induced gene expressions in cells and animal models	01			
		Applications	for use in functional biology, cellomics, gene expression and drug discovery research.				
		Scan Time	15 minutes or less				
		Laser source	3. 532nm±10 4. 635±10				
		Laser channels	2 or more				
		Sample type	Standard Microscope Slide/Glass Slide				
		Detector	Photomultiplier (PMT) minimum 1				
		Maximum Scan Area	20 x 70 mm or better				
		Maximum Resolution	2.5 microns or better				
		Fluorophore	Cy3, Cy5, Alexa555, Alexa 647, Alexa 660, including suitable filter for these dyes				
		UPS	as recommended by OEM				
		Computer	Computer with licensed image analysis software with power backup				
		Trining	Comprehensive training including air travel, boarding and lodging at OEM site				
Warranty	12 Months warranty 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 List of installations in Pakistan Training (at installation site) and installation						

06	Inverted Microscope	Purpose	Inverted microscope suited for investigation of live cells, fixed cells and bacteria.			
		General features	<ul style="list-style-type: none"> Trinocular inverted microscope with bright field, phase contrast and camera having antifungal optical system. Should have capability to upgrade into a fluorescent microscope. 	04		
		Objectives	4x	01 each		
			10x			
			20x			
			40x			
		Adjustable Eye Piece	10 × zoom	02 pairs		
			20 X zoom	02 pairs		
		Stage	The stage should be capable of handling cell culture flasks (T75 Flask) Petri dish and well plates.	01		
			Movement 126 (or higher)*78 mm (or higher)			
			Auxiliary stage attachable			
			Universal holder			
			Slide holder			
		Illumination	High luminescent white LED light			
Accepts 2 filters						
Heat absorbing filter and diffuser						
Extra long working distance (ELWD) condenser						
Focusing	Vertical objective movement					
	Via nosepiece up/down movement					
	Coarse stroke: 37.7 mm per rotation or better sensitivity (could be more or less up to 2.5 mm)					
	Fine stroke 0.2 mm per rotation (or lower)					
Camera	Compatible with microscope having 5 megapixels or better	01				
	CMOS based sensor for detection of high-quality images					

			<p>CMOS sensor size =1/1.8 inch or better</p> <p>Recordable pixels All pixels = 2880 x 2048 or better</p> <p>Selectable ISO Range = 50 - 3200 or better</p> <p>Live display mode = All pixels (2880 x 2048): 15 fps or better</p> <p>Exposure time 100μ sec (or lower) to 30 sec (or better)</p> <p>Interface: USB3.0 (connect with PC), External trigger along with software</p>			
		Computer system for camera	As recommended by OEM	01		
		Training	On spot training (installation site)			
		Warranty and others	<p>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</p> <p>Proofs of trainings of company personnel/engineers should be provided</p> <p>List of microscope installations in Pakistan and end user satisfaction certificate/s should be provided</p>			
6.1	Inverted Microscope	Purpose	Microscope for observing and recording images of surfaces and microstructures of metals and ceramics			
		General features	<p>Inverted microscope with following observation methods</p> <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 \times zoom	01 set		
15x or higher	01 set					
Illumination	LED Illuminator					

		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 for camera	As recommended by OEM	01			
		Installation and Training	Complete installation and Installation site training				
		Warranty & Others	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 List of microscope installations in Pakistan and end user satisfaction certificate/s should be provided				
7	Precision Cutting Machine	Purpose	<ul style="list-style-type: none"> ▪ Precision cutting of samples with 3D automated moment controllable with programming PLC ▪ Replaceable wearing plates including all the necessary clamping devices, cutting liquid and as well as mounting press to ease the holding of delicate samples. ▪ All necessary documentation along with power backup. 				
		General features	Variable speed 100 (or lower) to 4000 (or higher) rpm	1			

			<p>Working wheel diameter (replaceable): 150 mm (or more)</p> <p>Cutting diameter = 75 mm (or more)</p> <p>Fully automatic XYZ axis X = 60 mm or more Y = 210 mm or more Z = 45 mm or more X-axis resolution = 0.016 mm or better</p> <p>Adjustable table feed rate = 10 – 1000 µm/sec or better</p> <p>Fully programmable with LED based GUI interface</p> <p>Thin section grinding feature</p> <p>Laser based positioning</p> <p>Digital display with PLC for automated cutting</p> <p>Recirculating cooling system</p>			
		Accessories	Stand for specimen Vises	2		
			Universal Specimen Vise	2		
			Vise for Biomedical Samples	2		
			Diamond Cut-Off Wheels: Dia. 125 x thickness 0.38mm	5 blades		
			Diamond Cut-off wheels: Dia. 150 x thickness 0.40 mm	5 blades		
			Abrasive Cut-off wheels 0.25 mm x 200 mm	25 wheels		
			Blade dressing unit during grinding	1		
			Dressing medium	10		
			Mounting medium (phenolic resin)	5 kg		
			Oil for precision cutting	10 liters		
			Sample mounting press	<p>Automated Hydraulic press 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) ▪ Pressure 300 bar (or higher) ▪ Any two Mold sizes in between 25-50mm 	01	
		Power backup with additional	As recommended by OEM	01		

		Servo Stabilizer					
		Warranty & Others	<ul style="list-style-type: none"> ▪ 12 Months 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 ▪ List of installations in Pakistan should be provided 				
Sub Total Basis (Sr. # 8 to 11)							
8	Swiss Turn CNC Double Head machining center	Purpose	<ul style="list-style-type: none"> • Capable of machining sophisticated parts including dental implants and bone screws. • Capable of machining 316L and Ti-6Al-4V materials • With double head, tools and cooling unit including all accessories for dental implant manufacturing 		01		
		Swiss Turn CNC	Turning Diameter Main Spindle (mm)	20 or better			
			Sub spindle turning diameter (mm)	20 or better			
			Turning Length rotation (mm)	190/250 or better			
			Turning Length non bush in mm	50 or better			
			Turning Length Fixed bush (mm)	280/220 or better			
			Main Spindle Drilling/tapping capacity (mm)	Φ10/M8 or better			
			Sub Spindle Drilling/tapping capacity (mm)	Φ8/M8 or better			

			Cross Drilling/tapping (mm)	Φ8/M6 or better			
	Tooling		Number of outer dia. Tool Holder (pcs) ~ 12mm	6 or better			
			Number of internal dia. tool holder (pcs) ~ Φ22mm	4 or better			
			Spindle-1 Cross Live Tool Holder – Er-16 (pcs)	5 or better			
			Sub Spindle Face Live Tool Holder (pcs)	8 or better			
			Control Axis (with c-axis) pcs	8 or better			
			Main/sub spindle bore dia (mm)	26 or better			
		Movements and Rotation		Main/sub spindle speed (rpm)	10000/8000 or better		
			X1/Z1/Y1/X2/Z2/Y2 Rapid Traverse (m/min)	24 or better			
			Spindle-1 cross drilling maximum speed (rpm)	8000 or better			
			Spindle-2 face drilling maximum speed (rpm)	8000 or better			
			Controller	FANUC 32i or equivalent or better			
	Power and Lubrication		Power Requirement	25 KVA (or lower)			
			Lubrication Capacity in Liter	2 (or higher)			
	Accessories		Cooling Tank Capacity in liter	200 (or higher)			

			High pressure coolant system 70 bar with sub coolant tank and cutting oil cooler	01 set			
			External Tool holder (6 tools)	01 set			
			Internal tool holder (4 tools)	01 set			
			Side drilling tool holder (5 tools)	01 set			
			Complete Whirling Threading Unit with inserts and insert holders	01 set			
			Parts catcher	1			
			Parts conveyer	1			
			Tools and toolbox	1 set			
			Lighting Device	1			
			Rotary guide bushing holder 190 mm stroke or better	1			
			Spindle servo motor	1			
			Main spindle c-axis	1			
			Cutting coolant and inspection	1			
			Cut-off inspection	1			
			Sub spindle and sub spindle c-axis	1			
			Sub spindle tool holder for 8 position milling & drilling	1			
			Stationary tool holder (sub spindle)	1			
			Power tool holder ER16	1			

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			Chuck Gripper	1			
			Hexagonal Punching tool holder	1			
			Guide bush and safety lock	1			
			Non guide bush holder	1			
			Spindle Collet	1			
			ER 16 M2 inner tools holders	1			
			ER 16 collet set	1			
			3 position OD tool holder sub spindle	1			
			Deep Hole drilling device	1			
			Y2-axis	1			
			Chip conveyer & cart	1			
			Operational & maintenance manual in English	1 Set			
			Voltage Stabilizer As recommended by OEM				
		Machine installation and dental implants trial production	Machine should be tooled up along with tooling and program to manufacture 3 components of dental implants as per attached drawing				
			Vendor should supply dental implants samples before shipment and provide installation, commissioning, training which include manufacturing of dental implant (as per drawing available at Page # 47 to 49) by maker's engineers 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), along with facilities to handle troubleshooting. 2 end user				

			certificates from satisfied customers in Pakistan must be provided			
			Warranty: Minimum period of 1 year including service and parts			
			Comprehensive training including air travel, boarding and lodging at OEM site			
9	5 axis CNC machining Center	Purpose	<ul style="list-style-type: none"> ● 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	400/500/400 or better			
		Rotary Table diameter (mm)	300 or better			
		Maximum weight on table (kg)	100 (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)	15000 (or more)			
		tool length (mm)	300 (or more)			
		Tool fitting standards	BT40/DIN69871/CAT40/HSK A63			
		Rapid Traverse	48/48/48 or better			

		X/Y/Z (m/min)				
		Tool magazine and ATC (Nos)	24 or better			
		Maximum speed	A-axis (rpm) 25 or better			
			C-axis (rpm) 25 or better			
		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	LCD touch 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 hip stems. Vendor must provide installation, commissioning, training which include manufacturing of bone plates by maker's engineers 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), along with facilities to handle troubleshooting. 2 end user certificates from satisfied			

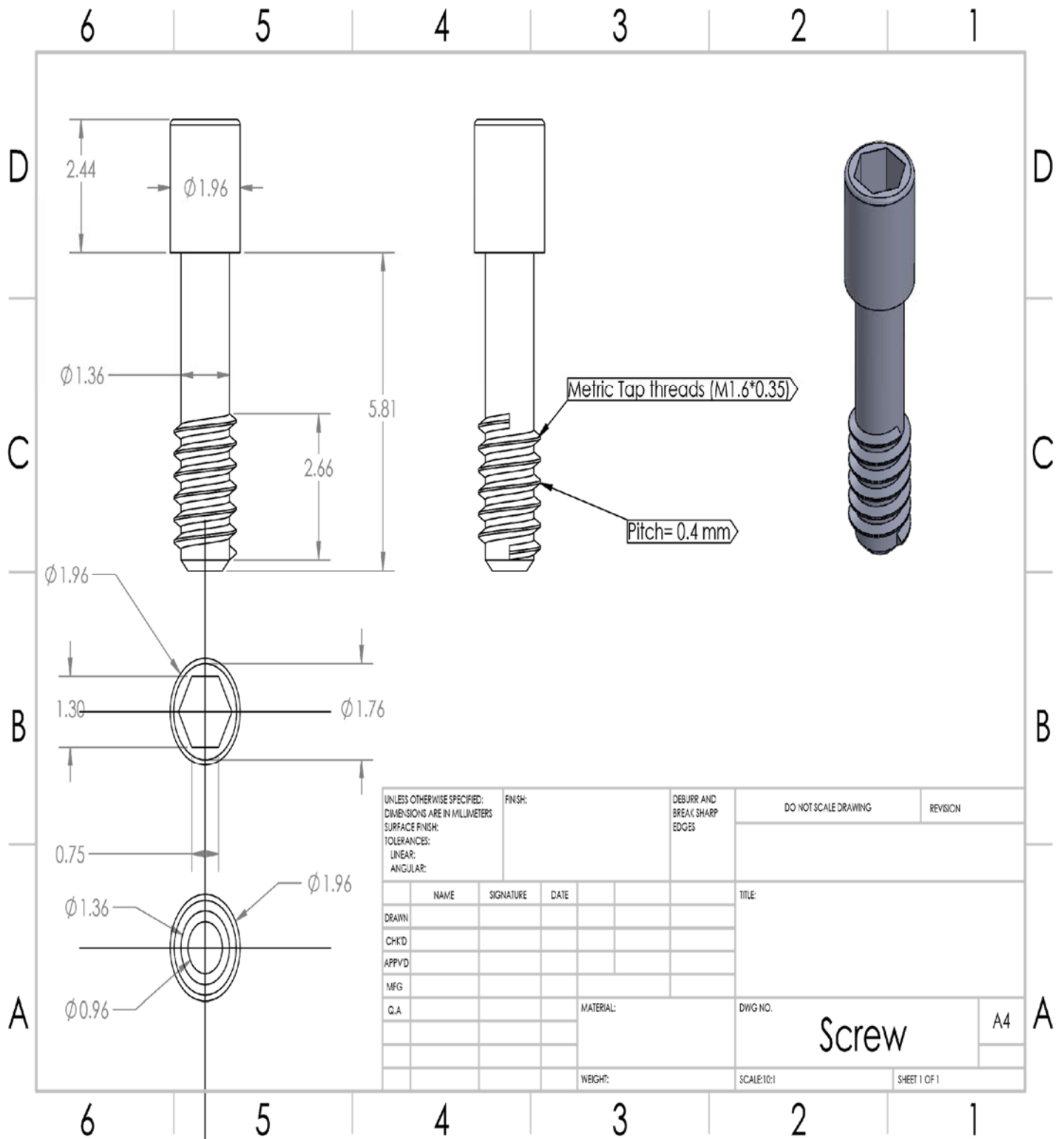
			customers in Pakistan must be provided				
		Warranty & Service	Warranty: Minimum period of 1 year including service and part				
10	Automatic CNC Lathe Machine	Purpose	<ul style="list-style-type: none"> Capable of machining sophisticated parts including biomedical metallic implants. Capable of machining 316L and Ti-6Al-4V materials. Capable of producing round heads with precise curvature e.g. femoral heads and including suitable attachments and accessories 	01			
		Swing over bed (mm)	450 or better				
		Turning diameter (mm)	100 or better				
		Bar capacity (mm)	30 (or higher)				
		Turning length (mm)	100 or better				
		Stroke X/Z (mm)	140 or better				
		X/Z axis traverse (mm)	15 or better				
		Position Accuracy	0.008 mm or better				
		Main spindle speed (rpm)	6000 or better				
		Turret tools	8 (or more)				
		OD tool size (mm)	16				
		boring tool size (mm)	Φ20 (or larger)				
		Inner cutting	Φ8, 10mm & 12mm				

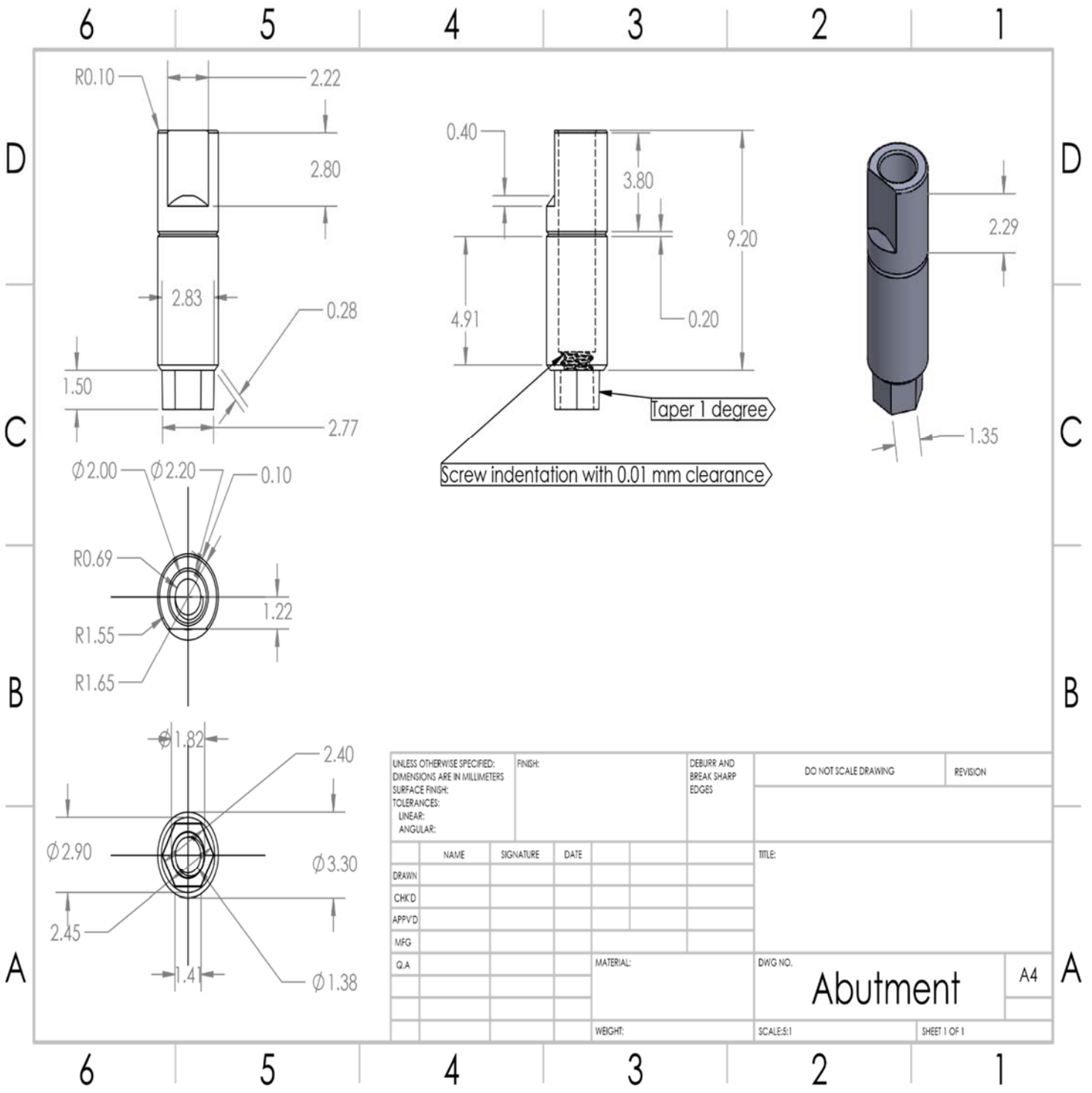
		sleeve (mm)				
		c-axis	yes			
		3 position servo face live tool or better	Should be included			
		4 position servo cross live tool +Y axis	Should be included			
		Accessories				
		4" Jaw Chuck	01			
		Collet Chuck	01			
		Part Conveyer and part catcher	1 set			
		Heat exchanger	1			
		Coolant device with splash guard	01			
		Tools with tool box	01 set			
		Controller	FANUC Oi or equivalent or better			
		Voltage stabilizer	As Recommended by OEM			
		Machine installation	Local company should have established setup and good reputation along with CNC operation, repair, installation/commissioning staff trained by OEM (certificate required), along with facilities to handle troubleshooting. 2 end user certificates from satisfied customers in Pakistan must be provided			

		Warranty	Minimum period of 1 year including service and parts					
11	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	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 should be included				
			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats				
			Troubleshooting	Remote access option				
		Laser Marking	Laser Power (W)	50 or better	01			
Laser Type	Fiber							

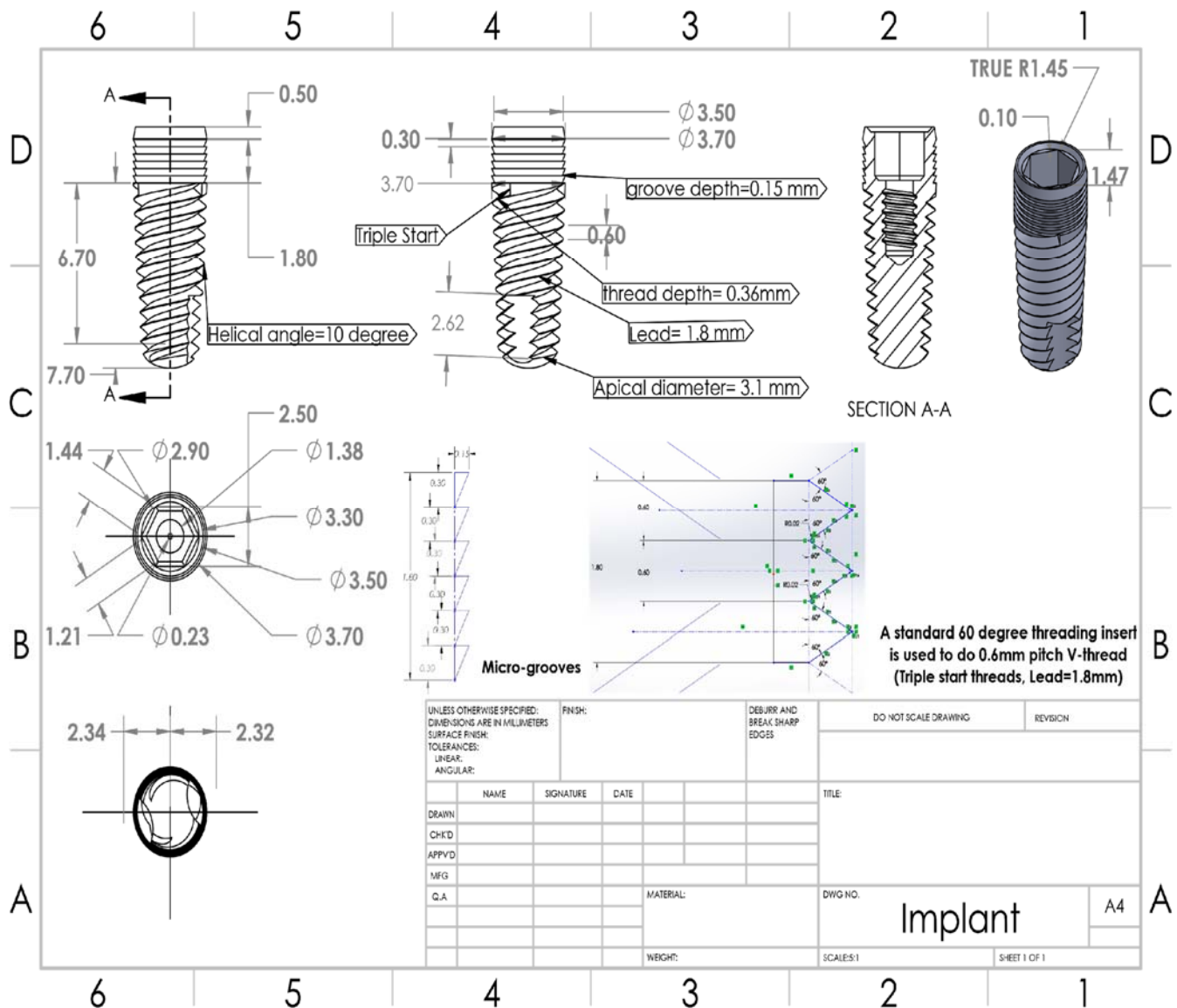
			Marking depth (mm)	0.1 (or higher)				
			Working accuracy (mm)	0.01 or better				
			Smallest achievable feature (mm)	0.2 or better				
			operation	Computer with software should be included				
			Supporting graphic formats	Corel draw, Autocad, photoshop and other widely used standard formats				
			Troubleshooting	Remote access option				
		Power back	Suitable power back up for the system. In case two separate systems are provided then two separate backups are required					
		Warranty & Others	<ul style="list-style-type: none"> ▪ 12 Months 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 ▪ List of installations in Pakistan should be provided 					
Sub Total Amount (C&F Lahore Airport) with mentioning of Quoted Currency (for Sr. # 8 to 11)								

Reference Diagram for Sr. # 8 i.e. Swiss Turn CNC Double Head machining center





UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		FINISH:	DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
SURFACE FINISH:					
TOLERANCES:					
LINEAR:					
ANGULAR:					
	NAME	SIGNATURE	DATE	TITLE:	
DRAWN					
CHKD					
APPVD					
MFG					
Q.A				DWG NO.	A4
				Abutment	
				SCALE: 5:1	SHEET 1 OF 1



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. Vendor will be responsible for Onsite Installation, Commissioning & Training of the delivered equipment's.
- iii. Purchase / work order (s) will be awarded on Item wise Basis for Sr. # 1 to 7 & on Sub Total Basis for Sr. # 8 to 11.
- iv. Kindly attach the Tender fee with Technical Bid and Bid money / CDR with Financial Bid.
- v. Multiple rates of an item may also lead to the rejection of bid / item.