



Govt. of Maharashtra



## Govt. College of Engineering, Nagpur



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"To be an Institution of National Repute Creating Globally Competent Technocrats to Serve the Society"

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No.: GCOEN/MED/Equip/Quotation/2022-23/ 4001

Date : 18-07-2023

To,

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### **Sub. : - Supply of Mechanical Engg. Lab equipment (Due Date 27/07/2023)**

Sealed Quotations are invited from eligible and interested manufacturers /dealers / distributors for the supply of Mechanical Engg. Lab equipment for Mechanical Engg. Deptt., as per the details given in the Table - I & II. The quotations should be submitted in two bid / envelope system. Bid submission procedure is given below.

#### **A. The first envelope shall contain Technical specifications of the product (as per Table - I), technical literature/ leaflet and other firm documents mentioned below.**

1. Covering letter of bidder on the company letter head mentioning official address, Contact No, e-Mail address and website (if available) URL.
2. Company registration certificate.
3. GST registration certificate.
4. GST Clearance Certificate/ GST Challan paid up to last quarter of the financial year.
5. OEM /Authorization/ Distributorship certificate from manufacturer.
6. Technical literature / leaflet of the make and model no of equipment quoted additional document may also be asked by undersigned for confirming the details.
7. Undertaking about quality of item and service after supply of items.
8. Warranty of each item in the list is of 2 years (minimum)

**Table – I: Technical bid format (to be submitted by supplier in 1<sup>st</sup> sealed envelope)**

Sr. No.	Name of the item with specification	Quantity required	Departmental Estimated Cost per Unit including GST & All Taxes (In Rs.)	(To be filled by the supplier)	
				Specification of Item offered	Deviation if any. (Yes / No)
1)	<b>Toolmaker's Microscope</b>	1 No	125000/-		
	<b>Specifications:</b>				
	a) It has X-Y movement on ball bearing slides, having micrometer (50mm dia)				
	b) Least Count -0.01 or 0.005mm with goniometer				
	c) Fixed magnification 30 x 150 x 150 mm stage and 360 degree rotary head.				
	d) Having both transmitted & incident light. Packed in a wooden box.				
	e) Observation Tube- Monocular, inclined at 30 degree				
	f) Base – Large and heavy base provides extra overall rigidity to the instruments				
	g) Stage – 150mm x 150mm size assembled on ball bearing guides to provide accurate and smooth stage stroke upto 50mm in each direction.				
	h) Illumination – Sub stage lamp emits transmitted light from a bottom source equipped with halogen lamp or LED 3W and incident from two lamps				
	i) Image: Erect image				
	j) Metz - 1395 AD Brand: Metzger				
	k) Magnification: 30x, 75x & 150x				
	l) Eye Piece Protector: Graduated 0 degree to 360 degree ,With adjustable Vernier of least count 6 minutes				
m) Built in base transmitted from 6W - 20W Halogen lamp or LED 3W and incident from two lamps					
n) Operational Manual Required					
2)	<b>Passive &amp; Active devices Trainer</b>	1 No	34000/-		
	<b>Specifications:</b>				
	a) The Practical kit for Passive devices Trainer (Resistors, Capacitors & Inductors) and Active devices Trainer (Diode, Transistor, FET, MOSFET & SCR				
b) The study of SSD in practical					

	involves, demonstration, Identification and application of Passive SSD and Active SSD.				
	c) The application part of the same can be demonstrated using Basic Logic gates Timer & Counter Trainer (Logic gates, Timer & Counter) kit.				
	d) Active Components/Devices: Transistor: Mostly used for amplifying electrical signals or as switching devices Diode: Permits electricity to flow in one direction only Integrated circuit (chips or microchips): multiple complex circuits on a circuit board; used to perform all kinds of tasks; still considered a component despite consisting of many other components Display devices such as LCD, LED and CRT displays Power sources such as batteries and other sources of alternating current (AC) or direct current (DC)				
	e) Passive Devices/Components: Resistor: Resists the flow of electrical current in a circuit; used to lower voltage Capacitor: Stores electrical energy electrostatically in an electric field (known as 'charging'), and can release it later when needed Inductor: Stores electrical energy in a magnetic field; allows direct current (DC) to flow through it, but not alternating current (AC) Transducer: Converts an input signal from one type of energy into another type; sensors are a type of transducer that convert physical action/input into an electrical signal				
	f) Warranty: 2 Years Operational Manual Required				
<b>3</b>	<b>Sensor Technology Lab</b>		<b>12500/-</b>		
	<b>Specifications:</b>	<b>1 each</b>			
	a) Limit Switches : NC / NO type lever type				
	b) Proxy Sensor: Inductive				
	c) Proxy Sensor : Capacitive				
	d) Optical Proxy Sensor : Optical Diffusion type				

	e) Optical Sensor : Through beam type				
	f) Angular Displacement : Capacitive Sensor				
	g) Sound Sensor : Capacitance type				
	h) Flow Sensor : For Air Flow Turbine type				
	Operational manual required.				

<b>4</b>	<b>Digital to Analog and Analog to Digital Converter kit.</b>	<b>1</b>	<b>10000/-</b>		
	<b>Specifications:</b>				
	a) Analog to Digital Converter (ADC) basically converts physical variables which are analog in nature to digital signal for processing.				
	b) High conversion efficiency.				
	c) Technical Specification DC Power supply +5V, 150 mA				
	d) DC Power supply +2.5V, 150mA				
	e) Power supply for reference voltage 0-5 V , 150 mA				
	f) Operated on mains power 230V, 50 Hz + 10%				
	g) Digital Voltmeter 2V / 20V DC				
	h) Operational Manual Required				

<b>5</b>	<b>Thermal Conductivity of Metal Rod</b>	<b>1</b>	<b>89000/-</b>		
	<b>Specifications:</b>				
	a) The experimental set up consists of metal bar, one end of which is heated by an electric heater while the other end of the bar projects inside the cooling water jacket.				
	b) A cylindrical shell filled with insulating material surrounds the middle portion of the bar.				
	c) Measurement of temperature at different sections of the metal bar.				
	d) Heat Input to the electric heater is given through variac.				
	e) Water at constant rate is circulated through the jacket and its flow rate and temperature rise measuring facility.				
	f) Metal Bar: Material-Copper; Length 400 mm (approx.);				

	Diameter: 25 mm				
	g) Insulating shell: Length 250 mm; Diameter 200 mm				
	h) Cooling Water Jacket: Length 75 mm; Diameter 100 mm				
	i) Heater: Nichrome Wire				
	j) Water Flow measurement: By Measuring flask				
	k) Control panel comprising of Digital Voltmeter: 0-250 Volt.				
	l) Dimmerstat : 0-230 V; 0 - 2 Amp				
	m) Temperature Sensors: RTD PT-100 type				
	n) Digital Temp. Indicator: 0-199.90C, with multi-channel switch, With standard make on/off switch, Mains Indicator etc.				
	o) The whole setup is mounted on a powder coated base plate				
	p) Control Panel: Standard make on/off switch, Mains Indicator etc.				
	q) Instruction Manual : An ENGLISH instruction manual shall be provided along with the Apparatus consisting of theory, diagrams, sample test readings and calculations.				
<b>6</b>	<b>Parallel Flow and Counter Flow concentric tube heat exchanger</b>	<b>1</b>	<b>78000/-</b>		
	<b>Specifications:</b>				
	a) Heat exchanger System : Water to Water, concentric tube type.				
	b) Hot water flows through inner tube in one direction only and cold water flows through the outer tubes. Direction of cold fluid flow can be changed from parallel or counter.				
	c) Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid.				
	d) A magnetic drive pump is used to circulate the hot water from a recycled type water tank, which is fitted with heaters and Digital Temperature Controller.				
	e) Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and clad by aluminum foil.				
	f) Outer Tube: Material Stainless steel. ID 27.5mm, OD 33.8 mm (approx)				
	g) Inner Tube : Material Stainless				

	Steel, OD 12.7mm (appx)			
	h) Hot Water Tank: Made of Stainless steel. Insulated with ceramic fiber wool.			
	i) Heaters : Nichrome wire heater (2Nos)			
	j) Control panel comprising of Digital Temp. Controller: 0-199.90C (For Hot Water Tank)			
	k) Digital Temp. Indicator: 0-199.90C, with multi-channel switch			
	l) Temperature Sensors: RTD PT-100 type. With Standard make On/Off switch, Mains Indicator etc.			
	m) A good quality painted rigid MS Structure is provided to support all the parts.			
	n) Control Panel: Standard make on/off switch, Mains Indicator etc.			
	o) Instruction Manual consisting of experimental procedures, block diagram etc. Operational Manual Required			

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**VIBRATION LAB :**

1

130000/-

**Universal vibration apparatus****Specifications:**

This apparatus enables a comprehensive arrangement of vibration experiments to be conducted on a single Sturdy M. S. channel basic frame as follows-

- a) To verify the relation simple pendulum.
- b) To verify the relation of compound pendulum & to determine the radius of gyration.
- c) To study radius of gyration of bi-filar suspension.
- d) To study the undamped free vibration of spring mass system.
- e) To study the longitudinal vibration of helical coiled spring.
- f) To study the forced vibration of simply supported beam for different damping.
- g) Undamped torsional vibrations of single rotor system.
- h) Undamped torsion vibrations of double rotor system.
- i) To study the damped torsional vibration of single rotor system and to determine the damping coefficient.

	j) To study the forced damped vibration of spring mass system.				
	k) TECHNICAL DETAILS: Exciter Unit : With FHP DC Motor with Speed Control Facility. RPM measurement: Digital RPM Indicator with Proximity sensor. Ordinary Chart recorder: For recording Frequency and Amplitude of Vibration. Stop Watch: Electronic Stop Watch. Instruction Manual: An ENGLISH instruction manual will be provided along. With the Apparatus CONTROL PANEL: Standard make on/off switch, Mains Indicator etc.				
	l) Operational Manual Required				
<b>8</b>	<b>Critical heat flux apparatus</b>	<b>1</b>	<b>72000/-</b>		
	<b>Specifications:</b>				
	a) The apparatus consists of a container to keep distilled water. The heating surface is in the form of a Nichrome heater wire completely submerged in the water. Water Bath: Suitable Capacity made of Stainless steel				
	b) Another heater (1.5 kW) submerged in the water to initially heat the water up to the required bulk temperature.				
	c) Temperature sensor to measure the temperature of the water in the container.				
	d) Dimmerstat (0-8 Amp) to give Electrical supply to heating wire.				
	e) Digital Voltmeter (0-300 Volt) and an ammeter (0-2 Amps) to measure the power input to heater arranged in				
	f) Insulated with ceramic wool having front & back window made of glass/acrylic.				
	g) Digital Temp. Controller: 0- 199.90C (For Water Bath)				
	h) Digital Temp. Indicator: 0-200°C, with multi-channel Switch				
	i) Temperature Sensors: RTD PT-100 type/K-Type				
	j) Control Panel having all indicators, switches and Mains controls				
	k) The whole set-up is mounted on a powder coated base plate				
	l) Heater: Nichrome wire heater (2 Nos)				
	m) Instruction Manual consisting of experimental procedures, block diagram etc.				
<b>9</b>	<b>Desert Air Cooler Test Rig</b>	<b>1</b>	<b>77500/-</b>		
	<b>Specifications:</b>				
	a) Desert Cooler Trainer works on the principle of evaporative cooling. It consists of a fan which sucks the air from atmosphere through the pads.				

	b) The difference in DBT & WBT at inlet and outlet can be measured hence the RH from the charts.				
	c) The amount of water evaporated can be calculated by knowing the water level difference in the reservoir.				
	d) Fan connected to 1/2 HP motor				
	e) Air Cooler Pump to circulate water.				
	f) DBT & WBT meters				
	g) Measuring Thermometers at inlet and outlet				
	h) Orifice meter with manometer to measure the air flow.				
	i) Overload Protector With Overload circuit With MCB				
	j) Control Panel: Standard make on/off switch, Mains Indicator etc				
	k) Real Time Data Measurement, analog or digital display				
	l) Technical and Instruction Manual consisting of experimental procedures, block diagram accompanies the unit.				
<b>10</b>	<b>Window air conditioner Test Rig</b>	<b>1</b>	<b>97000/-</b>		
	<b>Specifications:</b>				
	a) The unit will be fitted with all instruments facilities so that temperature, pressure etc. may be measured at different points in the air conditioning system.				
	b) Compressor: Hermitically sealed compressor.				
	c) Condenser : Air cooled compatible to 1 Ton compressor				
	d) Condenser Cooling fan: Compatible capacity with permanent lubricated motor.				
	e) Pressure Gauges: 2 Nos.				
	f) Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan.				
	g) Safety Control: over load and over current protection for Compressor with Time delay circuit.				
	h) Expansion Device: Capillary Tube compatible capacity.				
	i) Temperature Sensor: RTD PT-100 Type.				
	j) Temperature Measurement: Digital Temperature Indicator with multi-channel switch.				



	k) Other accessories like Hand shut off valves, filter drier and Thermostat, Pressure gauges shall be provided.				
	l) All the accessories will be mounted as rigid base frame made of M.S. and it will be powder coated.				
	m) Control Panel: Standard make on/off switch, Mains Indicator etc.				
	n) Technical and Instruction Manual consisting of experimental procedures, block diagram etc.				
<b>11</b>	<b>Three cylinder four stroke Petrol Engine with Morse test set up</b>	<b>1</b>	<b>620000/-</b>		
	<b>Specifications:</b>				
	a) <b>Type of Engine:</b> Multi Cylinder Four Stroke Water Cooled Petrol Engine				
	b) <b>Engine Cubic Capacity:</b> 1000 CC Min.				
	c) <b>Fuel Supply:</b> Carburetor/MPFI				
	d) <b>Type of Dynamometer:</b> Eddy Current Dynamometer				
	e) <b>Fuel Measuring System :</b> Fuel measuring system shall consists of a fuel tank, a burette and a three-way cock arrangement and Fuel sensor for computerized operation				
	f) <b>Air Flow Measurement :</b> For air flow measurement set up shall consist of Air tank fitted with orifice and water manometer along with differential pressure transmitter for computerized operation				
	g) <b>Morse Test Set Up:</b> Experimental Test Rig Should consist of ignition& starting switch, a high voltage knife switch assembly for cutting off each cylinder for Conduction of Morse Test				
	h) <b>Exhaust Gas Calorimeter :</b> Test Rig shall be attached with Exhaust Gas Calorimeter(Made of SS and insulated with glass wool with aluminum cladding) to measure the heat carried away by the exhaust				
	i) <b>Rotameter :</b> To measure the flow rate of water to the calorimeter				
	j) <b>Temperature Measurement:</b> Digital Temperature Indicator with multi-channel switch shall be there				

	for measurement of temperature at various junctions. Temp Sensors (RTD PT-100 type) shall be there at inlet & outlet to measure the temperature of water and exhaust gases				
	k) <b>Computer:</b> An experimental test Rig shall be provided with DESK TOP With following configurations Make/Model: HP or Equivalent Processor: Intel i7/12 Th Generation RAM:8 GB ; SSD:1 TB, Wireless key Board M.S.Office-21 Printer: Brother 2541 DW (Both Sided) or Equivalen				
	l) <b>DATA LOGGING AND DATA CONTROLLING:</b> Set up shall consist of HMI screen with PLC programming which displays all the parameters related to the equipment on the screen i.e. temperature sensor values, water flow rate, air intake flow etc.				
	m) <b>Software Compatibility:</b> The system should be able to connect the PC/LAPTOP using USB port. Compatible Software like LAB VIEW software will should be given to control and log the data related to the experiment				
	<b>Delivery period required (in weeks)</b>		<b>4 weeks</b>		
Also enclose Technical literature / leaflet/ photograph of equipment / Item that contains above details.					
Date - Place -	(Signature of Supplier) Office seal of Supplier				

**Table– II: Commercial bid format (to be submitted by supplier in 2<sup>nd</sup> sealed envelope).**

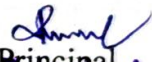
Sr. No.	Name of the item with specification	Quantity required	All inclusive cost per unit	All inclusive cost for quantity mentioned.
1.	Toolmaker's Microscope	01 No.		
2	Passive & Active devices Trainer.	01 No.		
3.	Sensor Technology Lab	01 No. each		
4	Digital to Analog and Analog to Digital Converter kit.	01 No.		
5	Thermal Conductivity of Metal Rod	01 No.		
6	Parallel Flow and Counter Flow concentric tube heat exchanger	01 No.		
7	VIBRATION LAB	01 No.		
8	Critical heat flux apparatus:	01 No.		
9	Desert Air Cooler Test Rig	01 No.		
10	Window air conditioner Test Rig	01 No.		
11	Three cylinder four stroke Petrol Engine with Morse test set up	01 No.		
Date - Place -				(Signature of Supplier) Office seal of Supplier

**B. The second envelope shall contain the financial bid (as per Table - II), in which the rates of items are quoted.**

1. The quoted rates shall be inclusive of all rates (such as taxes, freight, carting charges, insurance, packing and forwarding charges or any other surcharges) with a F.O.R. destination. Financial bid shall be signed with office seal of the supplier.
2. The material will be checked at this institute.
3. No extra charges will be paid for cartage, packing etc. for the material rejected & replaced.
4. Rates should be valid for 6 months from the date of confirmation letter.
5. Materials should be quoted for standard makes. with 2 years minimum warranty.
6. The required quantity may vary.

**C. Please note following procedures, terms and conditions while submitting the bids.**

1. Envelopes should be sealed with a mention of the type of envelope (Technical/ Financial), Reference no., Date of opening the quotation on the front side of the envelope. These two envelopes should be sealed in a third envelope by giving heading "Quotation for supply of Material & Equipment for "MECHANICAL ENGINEERING DEPARTMENT".
2. The quotations should reach the undersigned on or before **date 27/7/2023 upto 5 pm.**
3. Quotations will be opened at 11:00 AM on **date 28/7/2023.**
4. Representative/supplier may attend the office (if desired so) at the time of opening of quotations at their own cost.
5. The undersigned reserves the right to accept or reject any offer or all offers without assigning any reason thereof.
6. After the supply of items and the completion of warranty period (Two years) the supplier should provide maintenance services for at least two years at institute cost.

  
**Principal**  
Govt. College of Engg. Nagpur  
**Govt. College of Engineering**  
**Nagpur**