

Govt. of Maharashtra

Govt. College of Engineering, Nagpur

Sector- 27, Mihan Rehabilitation Colony Khapri, Nagpur-441 108 (Maharashtra State)

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

Phone No.: (07103) 295220(O), 295226(P), 295211(TPO) Website:- www.gcoen.ac.in

E-mail: principal.gcoenagpur@dtemaharashtra.gov.in - office. gcoenagpur@dtemaharashtra.gov.in

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

Date: 18-07-2023

To,

--- (Office Copy) ---

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 <u>Mechanical Engg. Lab equipment</u> 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 1st sealed envelope)

Sr. No.	Name of the item with specification	Quantity required	Departmental Estimated Cost per Unit including GST & All Taxes (In Rs.)			
				Specification of Item offered	Deviation if any. (Yes / No)	
1)	Toolmaker's Microscope	1 No	125000/-	onered	(1637110)	
	Specifications:		122000			
	a) It has X-Y movement on ball bearing slides, having micrometer (50mm dia)b) Least Count -0.01 or 0.005mm with	41-28-31/2				
	goniometer					
	c) Fixed magnification 30 x 150 x 150 mm stage and 360 degree rotary head.	G - F	of contract	ass was		
	d) Having both transmitted & incident light. Packed in a wooden box.			1 93		
	e) Observation Tube- Monocular, inclined at 30 degree	L-toling.				
	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		4.17.17.1			
	j) Metz - 1395 AD Brand: Metzer					
	k) Magnification: 30x, 75x & 150x		21 8/25	4-1-1-1-1		
	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					
90 ¹³ T.	n) Operational Manual Required					
2)	Passive & Active devices Trainer	1 No	34000/-			
	Specifications:		2.000			
	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	ger police en			
	Passive SSD and Active SSD.				
(c)					
	can be demonstrated using Basic				
	Logic gates Timer & Counter	-0.01	27 4 6, 100		
	Trainer (Logic gates, Timer &		5,4		
	Counter) kit.		The BITTER IS		
d)	Active Components/Devices:		The thought		
	Transistor: Mostly used for				
	amplifying electrical signals or as			The second second	
	switching devices		Acres 1		
	Diode: Permits electricity to flow	edward of			
	in one direction only			of and	
	Integrated circuit (chips or		March North		
100	microchips): multiple complex				
100	circuits on a circuit board; used to				
	perform all kinds of tasks; still				
	considered a component despite	Luce			
	consisting of many other	V 0 117 363 1			
	components				
	Display devices such as LCD, LED			4	
	and CRT displays				
	Power sources such as batteries and				
	other sources of alternating current				
	(AC) or direct current (DC)				
e)					
	Resistor: Resists the flow of	1 7			
100	electrical current in a circuit; used		31 3 8 4 7		
100	to lower voltage	Latin Town	77 2 97		
Page 1	Capacitor: Stores electrical energy		1 1 11 170		
	electrostatically in an electric field				
	(known as 'charging'), and can	877			
	release it later when needed			5 -	1 20 1 1 1 4
	Inductor: Stores electrical energy in	1000			
	a magnetic field; allows direct				
	current (DC) to flow through it, but				
	not alternating current (AC)				
	Transducer: Converts an input				
- 12	signal from one type of energy into				
	another type; sensors are a type of				
	transducer that convert physical				
	action/input into an electrical signal		April Charles Act		
f)					
	Operational Manual Required		200 / 201 / 100		
	tin del paradia resignado del como como de la la como de la como d				
	or Technology Lab		12500/-		
	fications:	1 each			
a)	Limit Switches: NC / NO type				
	lever type				
b)	Proxy Sensor: Inductive				
c)	Proxy Sensor : Capacitive				
,					
d)	Optical Proxy Sensor: Optical				

	e) Optical Sensor : Through beam type				
	f) Angular Displacement : Capacitive Sensor				
	g) Sound Sensor : Capacitance typ	20			
	h) Flow Sensor: For Air Flow	<i>,</i>			
	Turbine type				
	Operational manual required.				
1	Digital to Analog and Analog to Digi	tal 1	10000/-		
	Converter kit.	tai 1			4 144
	Specifications:				
	a) Analog to Digital Converter				
	(ADC) basically converts physi	ical			
	variables which are analog in		19 19		
	nature to digital signal for		11 35.25 1 11		
	processing.	11/10/1	384 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
	b) High conversion efficiency.				
	c) Technical Specification				
	DC Power supply +5V, 150 mA	1	2-1-37-1-17		
	d) DC Power supply +2.5V, 150m	Α		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
	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	a series			
	h) Operational Manual Required				
	ii) Operational Manual Required	A Property		-	
	Thermal Conductivity of Metal Rod	1	89000/-		
	Specifications:	1	89000/-		
	a) The experimental set up consist	c			
	of metal bar, one end of which i				
	heated by an electric heater whi				
	the other end of the bar projects				
	inside the cooling water jacket.				
	b) A cylindrical shell filled with				
	insulating material surrounds th	e			
	middle portion of the bar.				
	c) Measurement of temperature at			A STATE OF THE STA	
-	different sections of the metal b				
	d) Heat Input to the electric heater	1S			
	given through variac.				
	e) Water at constant rate is circulate				
	through the jacket and its flow r	ate			
	and temperature rise measuring				
	facility.				

	THE REAL PROPERTY AND ADDRESS OF THE PARTY AND				1	8
	Anticopa (encouperations	Diameter: 25 mm				
	g)					
		Diameter 200 mm				and a second
	h)	Cooling Water Jacket: Length 75				
		mm; Diameter 100 mm			-	
	i)	Heater: Nichrome Wire	OTA BENEVISIONE SERVICE TO LOCATION OF		THE THIRD STORY OF THE STORY OF	
	j)		THE STREET WITH A STREET WAS ARRESTED TO STREET, THE S			
	37	Measuring flask		The state of the s		1
	k)	Control panel comprising of	-			
		Digital Voltmeter: 0-250 Volt.				
	1)	是一个人们的人们的人们也不是一个人们的人们的人们的人们的人们的人们的人们的人们的人们的人们的人们的人们的人们的人				
	reministrative extraction and the second	Temperature Sensors: RTD PT-	_			
	111				and the same of th	
		100 type				
	11)	Digital Temp. Indicator: 0-				
		199.90C, with multi-channel				
		switch, With standard make on/off			1	
	- \	switch, Mains Indicator etc.			-	
	0)	The whole setup is mounted on a				and the same of th
		powder coated base plate				
	p)				200	
		on/off switch, Mains Indicator etc.				
	q)					
		ENGLISH instruction manual				
- 1		shall be provided along with the				
		Apparatus consisting of theory,				
		diagrams, sample test readings and		E .	1	1
- 1						
		calculations.		&		
<u> </u>	Parall	calculations.	1	78000/-	1	
1		calculations. lel Flow and Counter Flow	1	78000/-		A 4 4 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	conce	calculations. lel Flow and Counter Flow ntric tube heat exchanger	1	78000/-		
	conce Specif	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications:	1	78000/-		
	conce Specif	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to	1	78000/-		
	Specif a)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type.	1	78000/-		
	Specif a)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. Hot water flows through inner	1	78000/-		
	Specif a)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. Hot water flows through inner tube in one direction only and cold	1	78000/-		
	Specif a)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. Hot water flows through inner tube in one direction only and cold water flows through the outer	1	78000/-		
	Specif a)	lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. Hot water flows through inner tube in one direction only and cold water flows through the outer tubes. Direction of cold fluid flow	1	78000/-		
	Specif a)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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	1	78000/-		
	Specif a) b)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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.	1	78000/-		
	Specif a) b)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement:	1	78000/-		
	Specif a) b)	calculations. lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for	1	78000/-		
	b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid.	1	78000/-		
	b)	lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to	1	78000/-		
	b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re-	1	78000/-		
	b)	lel Flow and Counter Flow ntric tube heat exchanger fications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is	1	78000/-		
	b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital	1	78000/-		
	b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller.	1	78000/-		
	conce Specif a) b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m	1	78000/-		
	concers Specif a) b) c) d)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic	1	78000/-		
	conce Specif a) b) c)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and cladded by aluminum	1	78000/-		
	conce Specif a) b)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and cladded by aluminum foil.	1	78000/-		
	conce Specif a) b) c) d)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and cladded by aluminum foil. Outer Tube: Material Stainless	1	78000/-		
	conce Specif a) b) c) d)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and cladded by aluminum foil. Outer Tube: Material Stainless steel. ID 27.5mm, OD 33.8 mm	1	78000/-		
	conce Specif a) b) c) d)	lel Flow and Counter Flow Intric tube heat exchanger Ications: Heat exchanger System: Water to Water, concentric tube type. 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. Water Flow Measurement: Rotameters (2Nos.) one each for cold & hot fluid. A magnetic drive pump is used to circulate the hot water from a re- cycled type water tank, which is fitted with heaters and Digital Temperature Controller. Heat Exchanger: Length 1.6m (approx.). insulated with ceramic wool and cladded by aluminum foil. Outer Tube: Material Stainless	1	78000/-		

_	C. 1 OD 12 7 (onny)	17.0					
	Steel, OD 12.7mm (appx) h) Hot Water Tank: Made of		- Printer	ot an er			
	h) Hot Water Tank: Made of Stainless steel. Insulated with						
	ceramic fiber wool.						
	i) Heaters : Nichrome wire heater						
	(2Nos)						
2 4	j) Control panel comprising of	100					
	Digital Temp. Controller: 0-						
	199.90C (For Hot Water Tank)						-
	k) Digital Temp. Indicator: 0-						
	199.90C, with multi-channel		The state of				
	switch						
	l) Temperature Sensors: RTD PT-	4 10 7					
	100 type. With Standard make		Physical design				
	On/Off switch, Mains Indicator	e as a Deg	education de			10 100	
	etc.	Habs N				-	
	m) A good quality painted rigid MS		1000	71.6			
	Structure is provided to support all	to do the		2 1 2			
	the parts.		a lance and begin		10		
	n) Control Panel: Standard make						
	on/off switch, Mains Indicator etc.	and same					
	o) Instruction Manual consisting of		ph tourist	ti in ora to			
	experimental procedures, block	- laun	ar with defending	ria Lui			
	diagram etc. Operational Manual		e enquily body				
	D a graning d					1	
	Required			1 1 10 10 10			
		mat runii	120000/				
	VIBRATION LAB:	1	130000/-				
	VIBRATION LAB: Universal vibration apparatus	1	130000/-				
	VIBRATION LAB: Universal vibration apparatus Specifications:	1	130000/-				
	VIBRATION LAB: Universal vibration apparatus Specifications: This apparatus enables a comprehensive	1	130000/-				,
	VIBRATION LAB: Universal vibration apparatus Specifications: This apparatus enables a comprehensive arrangement of vibration experiments to	1	130000/-				,
	VIBRATION LAB: Universal vibration apparatus Specifications: This apparatus enables a comprehensive arrangement of vibration experiments to be conducted on a single Sturdy M. S.	1	130000/-				
	VIBRATION LAB: Universal vibration apparatus Specifications: This apparatus enables a comprehensive arrangement of vibration experiments to	1	130000/-				,
	VIBRATION LAB: 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.	1	130000/-				
	VIBRATION LAB: 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	1	130000/-				
	VIBRATION LAB: 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 & amp; to	1	130000/-				
	VIBRATION LAB: 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 & amp; to determine the radius of gyration.	1	130000/-				
	VIBRATION LAB: 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 & amp; to determine the radius of gyration. c) To study radius of gyration of bi-filar	1	130000/-				,
	VIBRATION LAB: 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 & amp; to determine the radius of gyration. c) To study radius of gyration of bi-filar suspension.	1	130000/-				,
	VIBRATION LAB: 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 & amp; to determine the radius of gyration. c) To study radius of gyration of bi-filar suspension. d) To study the undamped free vibration	1	130000/-				
	VIBRATION LAB: 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 & amp; to determine the radius of gyration. c) To study radius of gyration of bi-filar suspension.	1	130000/-				
	VIBRATION LAB: 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 & amp; 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	1	130000/-				
	VIBRATION LAB: 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 & amp; 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.	1	130000/-				
	VIBRATION LAB: 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 & amp; 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	1	130000/-				
	VIBRATION LAB: 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 & amp; 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	1	130000/-				
	VIBRATION LAB: 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 & amp; 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.	1	130000/-				
	VIBRATION LAB: 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 & amp; 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	1	130000/-				
	VIBRATION LAB: 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 & amp; 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.	1	130000/-				
	VIBRATION LAB: 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 & amp; 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	1	130000/-				
	VIBRATION LAB: 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 & amp; 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.	1	130000/-				
	VIBRATION LAB: 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 & Dendulum & Den	1	130000/-				
	VIBRATION LAB: 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 & amp; 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.	1	130000/-				

	j)	To study the forced damped vibration				
		of spring mass system.				
	k)	TECHNICAL DETAILS:				
		Exciter Unit: With FHP DC Motor		r terminal in E	The Late of the	
		with Speed Control Facility.				
		RPM measurement: Digital RPM				
		Ladiante with Provinity sensor				
		Indicator with Proximity sensor.				
		Ordinary Chart recorder: For				
		recording Frequency and Amplitude				
		of Vibration.				
		Stop Watch: Electronic Stop Watch.			1 1 1 2	
	100	Instruction Manual: An ENGLISH				
		instruction manual will be			0.000	
		provided along. With the Apparatus				- 1
		CONTROL PANEL: Standard make	- Note that		en la compara la compara de la	
	That is	on/off switch, Mains Indicator etc.				+
	1)	Operational Manual Required				
		715. ur 2 1		70000 /		
8		al heat flux apparatus	1	72000/-		
	Specif	ications:	The second	1		
	a)	The apparatus consists of a container to	3.00 413			
		keep distilled water. The heating surface		Alexa Zanasia Iv	a thie	
	-	is in the form of a Nichrome heater wire				
		completely submerged in the water.	II blindered			
		Water Bath: Suitable Capacity made of		SE PROPERTY LA	100 PM	
		Stainless steel	4.4		1. 1.752	
	b)	Another heater (1.5 kW) submerged in		11. 3. 5.20.25		
	0,	the water to initially heat the water up to				
		the required bulk temperature.	100	Port Theoretic	central a balla	- 10
	c)	Temperature sensor to measure the			THOUGH MENT	
	()	temperature of the water in the container.	1. 6. 7.	The Court of		
	d)	Dimmerstat (0-8 Amp) to give Electrical			4 14 6	
	u)	supply to heating wire.				
	e)	Digital Voltmeter (0-300 Volt) and an		A TOTAL OF THE STATE OF THE STA	Paragraphic II	
	"	ammeter (0-2 Amps) to measure the	- 117 - 118			
		power input to heater arranged in	1 1			
	f)	Insulated with ceramic wool having front	S. MINA	A SECTION OF THE		
	1)	& back window made of glass/acrylic.				
	g)	Digital Temp. Controller: 0- 199.90C	1			
		(For Water Bath)				
	h)	Digital Temp. Indicator: 0-200°C, with				
		multi-channel Switch		the en cont.	Service to the	1 1 1
	i)	Temperature Sensors: RTD PT-100				
		type/K-Type				
	j)	Control Panel having all indicators,				
	3)	switches and Mains controls		AND PROPERTY OF A	All of the second	
	k)	The whole set-up is mounted on a powder		and the second		
	K)	coated base plate		S. Karajar ya N		
	1)	Heater: Nichrome wire heater (2 Nos)				
	m)	Instruction Manual consisting of				
		experimental procedures, block diagram	100000000000000000000000000000000000000			
	1-	etc.		1383.00		
9		Air Cooler Test Rig	1	77500/-		
		ications:				
	a)	Desert Cooler Trainer works on				
		the principle of evaporative				
		cooling. It consists of a fan which				
		cucke the air from other and				
		sucks the air from atmosphere				
	1	through the pads.			1	

	1 1	TI 1:00 :					
	b)	The difference in DBT & WBT at					
- Y		inlet and outlet can be measured	1.11				
		hence the RH from the charts.				_	
	c)	The amount of water evaporated			1		
		can be calculated by knowing the	ا الري ا				
		water level difference in the					
		reservoir.					
	d)	Fan connected to 1/2 HP motor					
	e)	Air Cooler Pump to circulate					
		water.	4.75				
	f)	DBT & WBT meters					
	g)	Measuring Thermometers at inlet and outlet	. // 4, 12,967				
	h)	Orifice meter with manometer to	100				
100		measure the air flow.	44.5	Alighten Colonia			
	i)	Overload Protector With Overload			11571		
		circuit With MCB	1000				
	j)	Control Panel: Standard make		Kalan Zaning Lini	101 101		
	3,	on/off switch, Mains Indicator etc			deser Mala		
	k)	Real Time Data Measurement,	7 1 - 10				
		analog or digital display		$ \cdot = \cdot $ $ \cdot = \cdot $			
	1)	Technical and Instruction Manual					
	′	consisting of experimental					
		procedures, block diagram					
1 14		accompanies the unit.		a period San Committee Committee			
		1					
10	Wind		1	07000/			and the second second
10		ow air conditioner Test Rig	1	97000/-			
10	Specif	ow air conditioner Test Rig	1	97000/-			
10		ications: The unit will be fitted with all	1	97000/-			
10	Specif	ications: The unit will be fitted with all instruments facilities so that	1	97000/-			
10	Specif	The unit will be fitted with all instruments facilities so that temperature, pressure etc. may be	1	97000/-			
10	Specif	The unit will be fitted with all instruments facilities so that temperature, pressure etc. may be measured at different points in the	1	97000/-			
10	Specif 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.	1	97000/-			
10	Specif	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. Compressor: Hermitically sealed	1	97000/-			
10	specif a) b)	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. Compressor: Hermitically sealed compressor.	1	97000/-			
10	Specif 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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible	1	97000/-			
10	b)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor	1	97000/-			
10	b)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan:	1	97000/-			
10	b)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with	1	97000/-			
10	b)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor.	1	97000/-			
10	b) c) d)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos.	1	97000/-			
10	b)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton,	1	97000/-			
10	b) c) d)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and	1	97000/-			
10	b) c) d)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with	1	97000/-			
10	b) c) d) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan.	1	97000/-			
10	b) c) d)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over	1	97000/-			
10	b) c) d) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor	1	97000/-			
10	b) c) d) e) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit.	1	97000/-			
10	b) c) d) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit. Expansion Device: Capillary Tube	1	97000/-			
10	b) c) d) g)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit. Expansion Device: Capillary Tube compatible capacity.	1	97000/-			
10	b) c) d) e) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit. Expansion Device: Capillary Tube	1	97000/-			
10	b) c) d) g)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit. Expansion Device: Capillary Tube compatible capacity. Temperature Sensor: RTD PT-100 Type.	1	97000/-			
10	b) c) d) f)	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. Compressor: Hermitically sealed compressor. Condenser: Air cooled compatible to 1 Ton compressor Condenser Cooling fan: Compatible capacity with permanent lubricated motor. Pressure Gauges: 2 Nos. Evaporator: Compatible to 1 Ton, made of copper tube and Aluminum fins fitted with compatible capacity fan. Safety Control: over load and over current protection for Compressor with Time delay circuit. Expansion Device: Capillary Tube compatible capacity. Temperature Sensor: RTD PT-100	1	97000/-			

				The second of the second	
	k) Other accessories like Hand shut	TO THE STATE			
	off valves, filter drier and	1000			
-10	Thermostat, Pressure gauges shall	1			
	be provided.				
	l) All the accessories will be	7.19			
	mounted as rigid base frame made	1, H 3			
	of M.S. and it will be powder	35111			
	coated.	The Guillian			
	m) Control Panel: Standard make			The state of the s	
	m) Control Panel: Standard make		and the last control of	. 4. 100	
	on/off switch, Mains Indicator etc.			and the second	
	n) Technical and Instruction Manual	Sec. 2. 1. Land	egil i i ga Ne wellid		
	consisting of experimental		the state of the state of the state of	- 124	
	procedures, block diagram etc.				
11	Three cylinder four stroke Petrol	1	620000/-	m) er steriek e	
11	Engine with Morse test set up				
	Specifications:				
	a) Type of Engine: Multi Cylinder		112167.1.16		
	Four Stroke Water Cooled Petrol	1 to 10 10 10 10 10 10 10 10 10 10 10 10 10	a da base da		
	Engine	a was allowed		1121-2	
	b) Engine Cubic Capacity: 1000		ed and with	I SACTE TO	
	CC Min.		esibala processariona	se like	
	c) Fuel Supply: Carburetor/MPFI				
	d) Type of Dynamometer: Eddy		r gift mission has		
	Current Dynamometer	6.11	i digiran sa sa	STEP SECTION	
	e) Fuel Measuring System : Fuel	×301= 1			
	measuring system shall consists of		January 7 10 97	A CT 12	
	a fuel tank, a burette and a three-	147.1	all because to be said	10 100-1-	
	way cock arrangement and Fuel			F	
	sensor for computerized operation	HIGH	ngat ana palawa	42-14	
	f) Air Flow Measurement : For air		The second of the second		Annual Property
	flow measurement set up shall	Feet age	medical to layer		
	consist of Air tank fitted with				
de la constante de la constant	orifice and water manometer along				
	with differential pressure	100° + 1+4+ 11			
	transmitter for computerized	seed 1 5			
-3	operation	A 184		100	
	g) Morse Test Set Up: Experimental		5-1		
	Test Rig Should consist of				
	ignition& starting switch, a high	25 3.47			and the second
	voltage knife switch assembly for				
	cutting off each cylinder for				
	Conduction of Morse Test			101-17-1	
	h) Exhaust Gas Calorimeter: Test	1.7%			1111
	Rig shall be attached with Exhaust				
	Gas Calorimeter(Made of SS and	multi-May	Part Barrier		
	insulated with glass wool with				
	aluminum cladding) to measure				
	the heat carried away by the				
	exhaust				
	i) Rotameter: To measure the flow				
	rate of water to the calorimeter			1	
	j) Temperature Measurement:				
	Digital Temperature Indicator with multi-channel switch shall be there				
1	mater-channel switch shall be there			1 7 7 1	

1.60	for measurement of temperature at	1881,41.3			
	various junctions. Temp Sensors				
	(RTD PT-100 type) shall be there	Carrier Con	ed to a se		
	at inlet & outlet to measure the				
	temperature of water and exhaust				
	gases				
	k) Computer: An experimental test				
	Rig shall be provided with DESK	77 19			
	TOP With following				
	configurations Make/Model: HP	1416			
	or Equivalent Processor: Intel				
	i7/12 Th Generation RAM:8 GB;		C THE AN INTO	15 1 15 J. 1981	
	SSD-1 TD Window law David		A Fredhalf		
	SSD:1 TB, Wireless key Board M.S.Office-21	L - The Land			1000
	Printer: Brother 2541 DW (Both Sided) or Equivalen				
	l) DATA LOGGING AND DATA				
	CONTROLLING:				
	Set up shall consist of HMI screen				
	with PLC programming which				
	displays all the parameters related				
	to the equipment on the screen i.e.		Proceedings of the		
	temperature sensor values, water	- 1			
	flow rate, air intake flow etc.				
	m) Software Compatibility: The				
	system should be able to connect			7-100-2	
	the PC/LAPTOP using USB port.			100 000	
	Compatible Software like LAB				
	VIEW software will should be				
	given to control and log the data				
	related to the experiment				
	Delivery period required (in weeks)	1 450 5	4 weeks	10 No. 10	
A 1a		1 6	articles, and	Learne by L. C.	
AIS	o enclose Technical literature / leaflet/ photog	graph of equ	uipment / Item	that contains al	oove details.
		- 1	54.3 PM 100 TO 100		
Dat	e -		(Signature	e of Supplier)	
Plac	ce -		Office sea	of Supplier	
				Philot	

Table-II: Commercial bid format (to be submitted by supplier in 2nd sealed envelope).

Sr. No.	Name of the item with specification	Quantity required	All inclusive cost per unit	All inclusive cost fo 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	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.	an republish	
9' 113	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 -				(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.

- 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 ENGINERING 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
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