ATTENTION: Please mention Mechanical Engg Department on the envelope.

SHRI G.S. INSTITUTE OF TECHNOLOGY AND SCIENCE, INDORE

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To,

M/s _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

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Enquiry No. 268 dated 29/01/2024
Due date 15.02.2024
Subject: Quotations for items required
Dear Sir

Kindly quote your lowest price/rates for the following items form ready stock, so as to reach the undersigned on or before 15.02.2024 failing which the quotation will not be considered. The rates should be for only the materials asked for and not for any other substitute.

S. No.	Descriptions	Quantity
1	Dead Weight Pressure Gauge Tester	01
2	LVDT Trainer Kit	01
3	Load Cell Trainer Kit	01
4	Thermocouple Trainer Kit	02
5	Digital Multimeter	01
6	Strain Gauge Trainer Kit (with Cantilever Beam)	01
7	Digital Probe Thermometer 0-300ºC	04
8	Digital Vernier calipers 150 mm	04
9	Torque Measurement Trainer with datalogging Software	01
10	Linear System Simulator (Open loop & Close loop System of First order & Second order Systems)	01
11	Burdon Tube Pressure Gauge Trainer Kit	01

*Detailed specifications are enclosed

NOTE:

(i) Quoted rates should be FOR- Institute (Free Delivery).

(ii) Firm must have valid GST Registration, GST should be mentioned separately

(iii) Quoted rates to be valid for 45 days

(iv) Payment: 100% within 3 weeks, after satisfactory receipts at our Institute.

Thanking you

Yours faithfully,

Date: 29/01/2024

SPECIFICATIONS

Sl. No.	Specifications
1.	**Dead Weight Pressure Gauge Tester** The equipment is designed and fabricates to calibrate the pressure gauge. It consists of a cylinder piston arrangement made up of copper. It has one platform to apply load over it. At different load condition we can compare the actual pressure with the theoretical one. The present setup consists up a compactable fluid flow system to maintain pressure inside the cylinder. **Scope of The Experiment** • To study about the pressure measurement. • To calibrate the B-Tube pressure gauge. **Utilities required** • Oil SAE 40 • Table for set-up support • Floor Area 0.5 x 0.5 m square **Technical Details** • PIPING: Material Copper • Pressure Measurement: Using B-Tube pressure gauge (Range: 0 – 16 Kg/cm2) • Different loads will be supplied with this equipment to check pressure by applying load over platform. • The whole set-up is well designed and arranged on a good quality painted structure.
2.	**LVDT Trainer Kit** Objective: To study input and Output characteristics, Determination of Linear Range, Calibration as displacement meter and to determine Sensitivity of the instruments, Phase shift on C.R.O. **Specifications:** • Linear variable differential transform with ± 10mm displacement. • Effective Stroke(mm): ± 10 • Linearity: ≤0.25%FS • Repeatability: ≤1um • Temperature Range: -25℃~+85℃ • Shock Resistance: 250g/11msec • Vibration Allowed: 10g/2KHz • Temperature Coefficient ≤0.01%/℃ • Dynamic Characteristic: 10HZ • Sensitivity: ≤0.025%/℃ • On Board Digital Panel Meter with displacement Signal. • Output Available for Control & Monitoring. Micrometer for reference Displacement Reading using screw gauge. • Provided with excitation frequency. • Waveform display on CRO. • Test pins for monitoring. • In-built power supply, signal conditioning using IC 5521.
3.	**Load Cell Trainer Kit** **Specifications:** • Strain gauge with load cell with 3.5 Digital Panel Meter. • Measurement up to 2Kg. • Rated output: 1.0 ± 0.15 mV/V • Nonlinearity: 0.05%FS • Repeatability: 0.03%FS • Creep: 0.1%FS / 5min • Temperature effect on sensitivity: 0.003%RO/°C • Temperature effect on zero: 0.02%RO/°C • Zero balance: ± 0.1%RO

	• Input resistance: 1066 ± 20 • Output resistance: 1000 ± 20 • Insulation resistance: 2000MΩ • Recommended excitation voltage: 5V • Compensated temperature range: -10 ~ +50°C • Operating temperature range: -20 ~ +65°C • Safe overload: 120%RO • Ultimate overload: 150%RO • Weight set 50gm, 100gm, 200gm, 500gm. • Power requirement 230VAC +10% 50Hz • Detailed instruction manual.
4.	**Thermocouple Trainer Kit** Objective: To plot & Study the characteristics of 'K' type Thermo-Couple and to understand the concept of Thermocouple in instrumentation. **Specifications:** • Transducer K-Type Thermocouple signal conditioning circuit of constant current, power supply of ± 5V DC display at 3½ digital panel meter with resolution of 0.01mV. • Tolerance: -± 1.5 • Operating temperature: -up to 100°C • Thermocouple length: -100mm • Operating Voltage (VDC): -3 to 5.5 • Sensitivity: -approximately 41 µV/°C • Standard Accessories: Beaker, Heating Rod, K-Type thermocouple Thermometer (0-100ºC)
5.	**Digital Multimeter** **Specifications:** • Type: -Digital • Display Type: -LCD • Color: -Yellow • Material: -Plastic • Primary Functions: -1000V AC/DC, 10A AC/DC, RESISTANCE, CAPACITANCE, FREQUENCY, TEMEPARTURE • Number of Counts: -6000 • Brand Color: -YELLOW • LED Indicators: -No • Audible Continuity Test: -Yes • Display Size: -40 MM • Data Freeze: -Yes • Auto ranging: -Yes • Reading Storage: -No • Backlight: -Yes • PC Connectivity: -No **Power Features** • Battery Type: -1.5V • Number of Batteries: -2 • Functions • AC Current: -10A • DC Current: -10A • AC Voltage: -1000V • DC Voltage: -1000V • Capacitance: -6NF TO 6m F

6.	**Strain Gauge Trainer Kit (with Cantilever Beam)** **Specifications:** Strain Gauge Trainer Kit (with Cantilever Beam) The instrument is designed to study the Strain Gauge Transducer as a Direct Weighing machines to observe the effect of weight on the strain or resistivity of the Strain Gauge. DC Regulated Power Supply of for +12V Signal Generation circuit. DC Regulated Power Supply for 5V. Power Requirement :230V, ±10%, 50Hz Range :0-500m Strain Meter (Digital): 3% Digit LED Display Excitation Source: DC Excitation (5 Volt) Amplifiers: Instrumentation and Inverting summing Amplifier with Zero & Gain adjustment. Circuit Diagram: Screen Printed on front Panel Housed in PVC Cabinet, connection of all-important output, control switches & test point brought out at Bakelite front panel. Cantilever Beam|: A bonded strain gauge is mounted on a cantilever with arrangement to fix some load on it to generate the deformation Measuring Range: 500 mS Non-linearity Errors: ±1% Resolution:1 mS Dimensions: 330mm x 230mm x 85mm Weight : 4.5Kgs Approx. Power Requirement: 220VAC ±10%, 50Hz Standard Accessories: Power Cords, Patch Cords, Suitable Weight & Instruction Manual.
7.	**Digital Probe Thermometer** **Specifications:** Power supply: 1.5v (LR44) x1 Temperature: -50 to +300-degree Celsius Temp type: -58 to +572-degree Fahrenheit Resolution: 0.1-degree Celsius/ Fahrenheit
8.	**Digital Vernier calipers** Ceramic tipped jaws for outside measurement, extremely wear-resistant Measuring Range: - 0-150 mm Accuracy: - ±0.03 mm Resolution: 0.01mm/0.0005 Buttons: on/off, zero, mm/inch Automatic power off, move the digital unit to turn on power Battery SR44 Data output Made of stainless steel Optional accessory: data output system
9.	**Torque Measurement Trainer with datalogging Software** Comprises of strain gauge-based Reaction type Torque sensor, Fulcrum Arm of 1m length with L-angle to mount the sensor, Pan and weights to load the sensor. Digital Torque indicator is provided to read the Torque in Kg-m. The Setup is self-contained to do the experiment. **DISPLAY UNIT:** Digital Torque indicator will Digit Display along with Signal Conditioner for Wheatstone bridge sensor will be provided. The instrument has inbuilt power supply for whetstone bridge excitation and signal conditioner. The Main Features of the Indicator are • Calibration and Zero facility on front panel. • All necessary test points are brought out on front panel. Torque Indicator with Computer Interface is a micro-controller-based Instrument with RS 232/USB interface. Software is provided for Data logging, Plotting Graph, Excel Printing. The software works on windows 7 and above operating system.

	SPECIFICATION: **Torque cell** Capacity: 1 kg-m Fulcrum Arm: 1m long weights: 100 g x1No., 200g x2No., 500g x 1No**.** Strain gauge: 350 Ohm, Foil Type, Strain limit: 2.0%, Fatigue life: ≥1M, Contrast: 800: 1 (Min) (transmission), Sensitivity coefficient: 2.00-2.20 Micro Force Sensor: Microforce Sensing Probes are microforce sensors capable of measuring forces from 0.2 N down to sub 10 -9 N along the sensor's probe axis. Both compression and tension forces can be measured. The outstanding long-term stability and low signal drift guarantee significantly higher measurement accuracy than any other force sensing system in this force range. Sensor probe length: 3mm Sensor probe thickness: 50µm **Display Unit** Display: 16x1 LCD Display Connection: 4 Core shielded cable Resolution: 0.1kg-m Excitation: 10 V DC Communication: - RS232/USB Data Logging: - Software Provided Power Supply: 230 V AC 50 Hz
10.	**Linear System Simulator (Open loop & Close loop System of First order & Second order Systems)** Objective: - To Study the Transient Response of a Transfer Function in a Linear Control System. **Technical Specification: -** • Error Detector: - It has 3 Input & 1 Output. • Gain: - Non-Inverting Amplifier having gain from 0 to 10. • Integrator: - This is used in the system having a pot at the origin. • Time Constant: - Three are Two Time Constant Block in this unit which have the transfer Function of the Form K2 /(sT+1). • Disturbance Adder: - This is having two Input and One Output Block. • Amplifier: - To complete the feedback path one need to invert the signal so that resulting system is a negative feedback. Power Supply This amplifier is used for this purpose. • Power Supply: - This unit has internal ±12 Volt and ± 5Volt regulated power supply • which is permanently connected to all the circuits. • Power Requirement: - Single Phase 230Volt AC. • Dimensions: - (L X B X H) mm :-(300 X 220 X 75) mm. • Signal Sources: - • Frequency-40-90Hz (Variable). • Square Wave - P-P Amplitude 0-2 Volts • Triangular Wave - P-P Amplitude 0-2Volts • Trigger - ± 5Volts. **Standard Accessories: -** • Instruction Manual. • Ten No. of Patch Cords (4mm) • Power Cord.