

# ਆਈ. ਕੇ. ਗੁਜਰਾਲ ਪੰਜਾਬ ਟੈਕਨੀਕਲ ਯੂਨੀਵਰਸਿਟੀ ਜਲੰਧਰ, ਕਪੂਰਥਲਾ I. K. GUJRAL PUNJAB TECHNICAL UNIVERSITY JALANDHAR, KAPURTHALA DEPARTMENT OF ELECTRICAL ENGINEERING

#### Ref. No. IKGPTU/EE. 341.

Dated 30/5/18

Subject: Quotation for Instrumentation and Measuring Devices Lab of EE Department, IKGPTU Main Campus.

University intends to purchase lab equipment for Instrumentation and Measuring Devices Lab of Electrical Engineering Department, IKGPTU Main Campus by inviting sealed quotation. The supply order will be placed to the firm offering lowest rates (item wise). You are requested to send the sealed quotation of the items for Instrumentation and Measuring Devices Lab by quoting lowest rates (inclusive of all taxes, govt. levies, duties etc.) for Specification of Lab Equipment/items as per attached Annexure.

The quotation must be **addressed to**: <u>Registrar,</u> <u>I.K Gujral Punjab Technical University,</u> Jalandhar-Kapurthala highway, Kapurthala (Punjab-144603)

Note: The **postal address for sending quotation** is: <u>Head of Department,</u> <u>Department of Electrical Engineering</u> <u>I.K Gujral Punjab Technical University, Kapurthala (PB-144603)</u>

The quotation must reach by **20/06/2108 (Wednesday)** 02:30pm. Quotations will be opened at **03:00 pm on 19/06/2018 (Tuesday)**, in the office of the Dr. Gagandeep Kaur, Associate Professor, HOD (EE), Room No: 306, CB-1, 3<sup>rd</sup> floor. The Vendor/Supplier/Representative may be present at the time of opening of the quotation. If Government/University declares holiday on 19/06/2018 the quotation will be opened on the next working day.

#### Terms & conditions:

- 1. The items to be delivered at I.K Gujral Punjab Technical University, Jalandhar-Kapurthala Highway, Kapurthala (Punjab-144603) within 14 days of issuance of the supply order.
- 2. No advance payment will be made.
- 3. Payment will be released after inspection of the deliverer's goods/items and on receipt of the satisfactory report.
- University will not be paying anything extra as the rates invited are inclusive of all taxes, govt, levies, duties etc.
- 5. The Vendor/Supplier must attach a copy of GST Number.
- Please Subscribe on the envelop <u>Quotation for Instrumentation and Measuring Devices Lab, EE</u> <u>Dept. & to be opened by committee only.</u>

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Head of Department, Electrical Engineering

"Propelling Punjab to a prosperous Knowledge Society"

I.K. Gujral Punjab Technical University Jalandhar Kapurthala Highway, Kapurthala-144603. Mobile : 94780-98118 website : www.ptu.ac.in Email : hodee@ptu.ac.in

#### Annexure: A

### Instrumentation & Measuring Devices Lab Equipment Specifications

Sr. No.	Experiment/Equipment	No. of Units	E
1	To study the input-output characteristics of a potentiometer and to use a potentiometer as an error detector. <b>Potentiometer Error Detector</b> To study of potentiometer as error detector element two full 360 rotation servo-potentiometer with 1° resolution. IC regulated DC excitation for both potentiometer AC excitation at 400 Hz approx. Built in demodulator circuit. 3.5 digit DVM for carrying measurement. IC regulated power supply for rest circuitry. Complete with instruction manual with patch cords,220V mains operated.	2	
2	<ul> <li>To measure Insulation Resistance by Megger.</li> <li>Features:</li> <li>Test voltage 1000V, 2500V, 5000V</li> <li>Measure insulation resistance to 200GΩ with 0.01mΩ resolution</li> <li>AC voltage measurement to 600V</li> <li>Check phase sequence and phase status</li> <li>Data hold, auto range, auto power off, LCD background light</li> <li>Complete with test leads, phase wire, heavy duty carry case and six 1.5V AA batteries</li> </ul>	2	
3	To measure earth resistance by Earth Tester. Features: Non-interrupted functionality Accuracy in resistance measurements Low maintenance Specifications: Measurement Ranges: Resistances: $0 - 20 \text{ k}\Omega$ (auto ranging) Resistivity: $0 - 50$ K $\Omega$ (auto ranging), Voltages: $0 - 60 \text{ V}$ • Safety Class: IEC 61'010-1 / 1990, IEC 61010 - 1 / 1992 amendment 2 • Electrostatic Immunity: In accordance with IEC 1000-4-2 • Electro Magnetic Irradiation Immunity: In accordance with IEC 61000-4-3 • Environmental Protection: IP 54 with closed lid • Altitude Maximum: 3000 m • Operation Temperature: -10 C to 50 C • Storage Temperature: -25 C to 65 C • Humidity: 95 % RH (without condensation) • Dimension: 274 x 250 x 124 mm • Weight: Aprox. 3.0 Kg (without accessories)	2	
4	To observe phase sequence of three phase circuit using Rotating type Phase Sequence Indicator.	02	

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# Annexure: A-

	<ul> <li>Special Features:</li> <li>Two functions in one unit</li> <li>Designed to check phase sequence</li> <li>Lamps provided on the unit indicates whether phase is open or which phase is open at that particular moment</li> <li>Functional design</li> <li>Small, portable and lightweight</li> <li>Designed for maximum ease of operation</li> <li>Safety design</li> <li>Specifications: <ul> <li>Voltage: 90 V-600 V AC</li> <li>Frequency Response: 50/60 Hz</li> <li>Weight: Approx. 510 g</li> <li>Cord: 1.1 m each of Red (R), White (S) &amp; black (T) cord</li> <li>Accessories: Instruction manual and Vinyl case.</li> </ul> </li> </ul>	
5	To measure frequency of A.C. supply using Digital Frequency Meter.	2
6	Digital Power Factor Meter	2
7	LCR Meter. <b>Specifications:</b> Dimensions:143*75*32mm • Operating Temperature: Normal • Measuring Capacitance Range: 2000pF 200µF	2
8	Light measurement using LDR and photo cell sensor. Measurement of Length by LDR Study of light dependent resistor as light intensity measuring transducer. Sockets for LDR to measure resistance at different intensity levels to determine the non liner nature. 1 <sup>st</sup> degree linearization circuit. Unbalance bridge for LDR interface.12 volt 21 watt TUGSTON lamp with intensity control (continuously variable). Calibration graph supplied with the tutor Limiter (optional). 3.5 digit DPM as light intensity indicator. Sockets at different places to study the process to find out the error rate. Detailed instruction manual.	2
9	Capacitive Transducer Range: 0-250 mm Jar with scale capacitive transducer sockets at different point for observations. 3.5 digit DPM for indication. 220 V, built in IC regulated power supply.	5

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#### Annexure: A

## Instrumentation & Measuring Devices Lab Equipment Specifications

	Detailed instruction manual.	
10	Measurement Of Air Velocity Transducer         Sockets at different points for observations.         3.5 digit DPM for indication.         220 V, built in IC regulated power supply.         Detailed instruction manual.	2
11	Study of the characteristics of a Piezoresistive Sensor for Pressure Measurement of a Liquid in a Tank	2
12	Contact Less Tachometer Study of speed measurement by light interrupt method.12V,2400 RPM permanent magnet DC motor. Speed controller(0-2400 RPM). Opt interrupter disc, LED as light source, photo diode as sensor. Signal conditioning circuit based upon op amps. Electronic TACHOGENERATION. 4 digit digital counter as speed indicator. Test points at various places to study the process. The motor and transducer unit is covered with acrylic sheet. Built in IC regulated power supplier for motor and process circuit.	2