



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

Ref. No. IKGPTU/EE/1340.

Dated 30/5/18

Subject: Quotation for Control Systems Lab of EE Department, IKGPTU Main Campus.

University intends to purchase lab equipment for **Control Systems 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 **Control System 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:**

Registrar,

I.K Gujral Punjab Technical University,

Jalandhar-Kapurthala highway, Kapurthala (Punjab-144603)

Note: The **postal address for sending quotation is:**

Head of Department,

Department of Electrical Engineering

I.K Gujral Punjab Technical University, Kapurthala (PB-144603)

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, 3rd 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.
4. 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.
6. Please Subscribe on the envelop Quotation for Control Systems Lab, EE Dept. & to be opened by committee only.

Gagandeep
30/5/18

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

Control System Lab Equipment Specifications

S.No.	Experiment/Equipment	No. of Units
1	To study the synchro Transmitter-Receiver set and to use it as an error detector Synchro Transmitter & Receiver Trainer :Study of Selwyn two dials for input/output angular displacement knobs with large pointers on transmitter and receiver sockets for rotor(R1,R2)and stator (S1S2,S3)on panel . Built in isolated power supply for both attenuated output on sockets for view of signal observation on CRO supporting literature with cords,220V mains operated.	2
2	To study the Speed – Torque characteristics of an AC Servo Motor and to explore its applications. AC Servomotor Torque/Speed Characteristics Trainer : Two phase ac servo motor (2500 RPM) Electronic speed sensor with RPM display upon panel meter ammeter for load current. DC motor for loading, torque calculation from back emf. Speed controller for motor isolated supply for motor Supporting literature with patch cords,220V mains operated.	2
3	To study the Speed – Torque characteristics of an DC Servo Motor and explore its applications. DC Servomotor Torque/ Speed Characteristics Trainer Shunt wound DC servomotor Separate field and armature DC supplies. Two analog meter to take reading of volt and current for filed and armature. Analog RPM meter, Belt and pulley loading for torque measurement. Detailed instruction manual with patch cords, 220V mains operated.	2
4	To study various electro-mechanical transducers i.e. resistive, capacitive and inductive transducers	2
5	To study photo-conductive cell, semi-conductor photodiode and a silicon photo voltaic cell. Study of photo-conductive cell, semi-conductor photodiode and a silicon photo voltaic cell as temperature measurement transducer electrically heated block to raise temperature >200°C ,With different voltage.	2
6	To study a silicon phototransistor and obtain response of photo conductive cell.	2
7	To study the variations of time lag by changing the time constant using control engineering trainer .	2

Control System Lab Equipment Specifications

8	To study the operation of a position sensor and study the conversion of position in to corresponding voltage (ii) To study an PI control action and show its usefulness for minimizing steady state error of time response.	2
9	To measure Force / Displacement using Strain Gauge in a wheat stone bridge Measurement of Force by Strain Gauge using Cantilever Beam Study of load Range :0-2 Kg. Load cell Weights for measuring load. Test point for measuring signals. 3.5 digit DPM for indication of load 220, IC regulated power supply.	2
10	COMPENSATING CIRCUITS Study of lag, lead and lag-lead Second order simulated system, study of all pass filter Lag, lead and lag-lead compensating circuits Gain compensating amplifier with calibrated dial SIGNAL SOURCES Sine wave: Continuously variable in two decades (10-100 Hz) With 0-8Vpp amplitude Square wave:-20,40&80Hz spot frequencies with 0-2Vpp amplitude Digital phase angle meter 0-180° Complete with patch cords and detailed literature,220V mains operated.	2