

**Rajiv Gandhi Institute of Technology, Kottayam**

No. D1/1156/18/RIT

Dated: 12.06.2018

TENDER SCHEDULE

Superscription	: Tender No. D1/1156/2018/RIT
Last date and time receipt of tender	: 10/07/2018 1 pm
Date and time of opening of tender	: 10/07/2018 2 pm
Last date and time of sale of tender form	: 09/07/2018 1 pm
Date upto which the rates are to be firm	: 31/05/2019
Cost of tender form	: <b>Original Rs. 784/-</b> <b>Duplicate Rs. 448/-</b> <b>By Post Rs. 35/- Extra</b>
Address of the Officer from whom Tender Forms are to be obtained to whom tenders are to be send	: THE PRINCIPAL, Rajiv Gandhi Institute of Technology Velloor P. O, Pampady Kottayam - 686501

List of Items Required

<b>Details of items</b>	<b>Quantity</b>
1 Items for use in Control and Simulation Lab of Electrical and Electronics Engineering Department(details attached)	

PRINCIPAL

**List of Items to be Purchased**

Sl. No.	ITEM	Quantity
1	<p><b>P, P1, PID CONTROLLER TRAINER:</b> Trainer should contain simulated blocks, PID controller &amp; built in signal source. Simulated blocks should have the blocks of dead time (transportation lag), Integrator, Time constant, Error detector and gain. PID controller should be configured as P, PI, PD or PID. It should have 5% to 50% (Gain 2-20) Prop. Band, 10msec-100msec integral time &amp; 2-200msec derivative time. Built-in signal sources should have Set Value of -1V to +1V, Square wave of 1V p-p (min) at 40Hz&amp;Triangular of 1V p-p (min) at 40 Hz. All interconnections to be made using 2 mm banana patch cords. Test points to be provided to analyze signals at various points. ICS should be mounted on IC Sockets. Bare boards Tested Glass Epoxy SMOBC PCB should be used. In-built power supply should have +5V/1.5A, ± 12V/250mA with power ON indication. Set of 2mm Patch cords for interconnections to be provided with user manual.</p>	2
2	<p><b>SYNCHRO TRANSMITTER &amp; RECEIVER:</b> The input and output angular displacement should be displayed. Two rotor terminals (R1&amp;R2) three stator terminals (S1, S2 and S3) should be brought out on the front panel. Should have locking system for receiver rotor. Receiver could be used as control transformer. Should have built-in balanced demodulator circuit. Should have panel meter for ac/dc voltages. All interconnections to be made using 2mm banana patch cords. Test points to be provided to analyze signals at various points. All ICS should be mounted on IC sockets. Bare board Tested Glass Epoxy SMOBC PCB should be used. In-built power supply should have power ON indication. Set of 2mm Patch cords for interconnections to be provided with user manual.</p>	2
3	<p><b>TEMPERATURE SENSOR TRAINER:</b> Study of four different temperature transducers-NTC thermistors, RTD Platinum, K(Cr-Al) thermocouples, IC temperature sensors. Study&amp; comparison of Temperature transducer controlled alarm system. PID control should have P, P+I, P+D &amp; P+I+D control action. Trainer should have instrumentation amplifier, added amplifier X1, X100, X235, P controller, I controller, D controller Comparator, Electronic switch, signal conditioning, Rotary/Slide pots, Heater, Relay, Buzzer, LED. Digital meter with actual/Set temp/mV to be provided. All interconnections to be made using 2 mm banana patch cords. Test points to be provided to analyze signals at various points. All ICS should be mounted on IC sockets. Bare board Tested Glass Epoxy SMOBC PCB should be used. In-Built power supply should have Power ON indication. Set of 2 mm patch 2mm Patch cords for interconnections to be provided with user manual.</p>	2

4	<p><b>TEMPERATURE CONTROLLER TRAINER:</b> The trainer should have temperature controller block with facilities for P, I D and relay control blocks. Operating temperature of Ambient to 90°C. Separate controls for P, I, D channel gains to be provided. Should have two settings for relay hysteresis. Fast 25W oven fitted with IC temperature sensor to be provided. Should have digital display for set and measured temperature on 3½ digital built-in DVM. Buffered output for recorder to be provided. IC regulation to be given in controlled circuit power supplies. All interconnections to be made using 2mm banana patch cords Test points to be provided to analyze signals at various points. All ICS should be mounted on IC sockets, Bare board Tested Glass Epoxy SMOBC PCB should be used. In-Built Power supply should have power ON indication. Set of 2mm Patch cords for interconnections to be provided with user manual.</p>	2
5	<p><b>COMPENSATION DESIGN TRAINER:</b> Simulated 'uncompensated' system should have adjustable damping, Peak percent overshoot Mp, variable from 20% to 50%, and steady state error variable from 50% to 0.5%. Compensation network should be implemented through built-in variable amplifier gain should be adjustable from 1 to 11. Should have built-in square and sine wave generators for transient and frequency response studies. Frequency should be adjustable from 25Hz, 800 Hz (approx.) All interconnections to be made using 2mm banana patch cords Test points to be provided to analyze signals at various points. All ICS should be mounted on IC sockets, Bare board Tested Glass Epoxy SMOBC PCB should be used. In-Built Power supply should have power ON indication. Set of 2mm Patch cords for interconnections to be provided with user manual.</p>	2
6	<p><b>FLOW CONTROLLER TRAINER:</b> Flow Sensor: (a) Orifice with DPT (ULP-250). (b) Turbine type flow Meter (Paddle Wheel) (ULP-25T)-water circulation : FHP Pump with necessary piping (Flexible type). Source Tank : SS Tank of capacity 20 lt (approximately) Control Valve: ½" Globe valve (Linear) 15mm Stem travel. Actuator: Diagram type Pneumatic Actuator input 3 to 15 PSI supply air pressure upto 60 PSI-PC interface card: 16 Bit ADC(8ch) with 12 Bit DCA interface with PC through RS232 USB port, Power Supply: 230V 50 Hz pressure gauges: Bourdon pressure gauge. 0-100PSI - 1 No, 0-30 PSI- 1 No. Manual Bypass Valve : Needle valve (½") for Manual Bypass. Flow measurement: Rotameter (1500 LPH), Digital indicator (optional) Mounting: Mounted on a powder coated metal frame (appi: 650X500X750 LXBXH) contrller: PC based dedicated PID software to control the process, control action P, PI, PID, Trend plot with online and off line analysis. Printing and analysis.</p>	1