



Central University of Karnataka

(A Central University Established by Parliament Act of 2009)
Kadaganchi, Aland Road, Kalaburagi Dist. - 585 367

No. CUK/EE/2022-23/01

Date: 28/02/2023

Quotations are invited to supply the Basic Control system lab equipment.

The Department of Electrical Engineering invites quotations for the supply of Control system lab equipment. The complete details will be found on the University website (www.cuk.ac.in). Interested suppliers may submit the quotations in the sealed cover (hard copy) to The Registrar, Central University of Karnataka, Kadaganchi Campus, Aland Road, Kalaburagi- 585367, within ten days from date of publishing.

ANNEXURE-1

SL NO	DESCRIPTION	Quantity
1	Time response of Second Order Systems study unit: <u>Specifications:</u> This Second Order system is using Op – amps and R, L and C. Built-in signal source – square and DC. Damping factor – 0.3, 0.7, 1 and 2. Time constants – 3 sec and 5 msec for second order system using Op-amp. Damping factor vary from 0 to 2 for second order system using RLC. Mains operated.	02
2	Lead-Lag Network study unit: <u>Specifications:</u> Signal generator – 50Hz – 1 MHz. Microcontroller based LCD to display the frequency/phase angle meter with lead/lag indication. A digital voltmeter is provided to measure the V _{peak} of Network input & Network output to calculate gain. Different values of resistors & capacitors supplied along with this unit to connect in Lead – Lag Network.	02
3	PID Controller trainer(Analog circuit based): <u>Specifications:</u>	

	<p>Signals sources consists of Variable low frequency Square wave and triangle-wave generator with variable amplitude. This square wave used as command input to the system. The Square wave is treated as repeated step input. The triangular wave is used for external x-deflection in the CRO.</p> <p>The Controller is an analog proportional, Integral & Derivative (PID) in which the PID parameters are adjustable. The values canet with in the following range through 10 turn calibrated potentiometers with dial.</p> <p>Proportional gain – K_c - 0 to 20</p> <p>Integral gain – K_i - 0 – 1000</p> <p>Derivative gain – K_d - 0 – 0.01.</p> <p>PROCESS:</p> <p>First Order system: First order system with time constant of 3msec.</p> <p>Second Order system: Second order system using RLC with variable damping factor.</p> <p>Time constant: 1 msec – suitable for – square wave input.</p> <p>Integrator: 2 msec time with 180° phase shift.</p>	02
4	<p>Two phase AC servomotor speed – torque characteristics study unit:</p> <p><u>Specifications:</u></p> <ul style="list-style-type: none"> • Two phase AC servomotor – 230Volts • Auto transformer to vary the control voltage to vary the speed • Digital ammeter to measure the current. • Microcontroller based digital speed indicator using photo electric sensor. • Indirect loading using PMDC motor. 	02
5	<p>DC servomotor speed torque characteristics study unit:</p> <p><u>Specifications:</u></p> <ul style="list-style-type: none"> • DC servomotor – 24V/400 gm-cm. • Microcontroller based speed measuring system. • Mechanical loading arrangement for motor. • Digital ammeter to measure load current. • 0-24V variable DC supply for speed variation. 	02
6.	<p>Frequency response of Second Order Systems study unit:-</p> <p><u>Specifications:</u></p> <p>Signal generator – 5Microcontroller-basedntroller based LCD display to display the frequency/phase angle meter with lead/l To calculate gain, a digital voltmeter is provided to measure the V_{peak} of Network input & Network output calculate gain.</p>	02

	RLC components with variable R to vary the Damping factor from 0 to 2 to study frequency response of second order system using RLC. Mains operated.	
7	a) Decade resistance box (0.001-100 M Ω)	5
	b) Decade Capacitance box (1pF-100uF)	5
	c) Decade Inductance box (10uH-10H)	5
8	Digital Clamp meter Specification : Voltage (AC/DC) - 0-600V Current (AC/DC) - 0- 600A	5

Instructions:

1. All the kits should include necessary metering arrangements, Power Cables up to 3-5 meters, and Patch Cords/Connecting wires.
2. Detailed Instruction Manuals should be supplied along with circuit diagrams, procedures and result tables.
3. The quotation cost must include transportation, installation, and three years of on-site service.
4. Quotation cost must include GST.


 Dr. Veeresh G. Kasabegoudar
 Chairman of LPC

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अभियांत्रिकी स्कूल / School of Engineering
 कर्नाटक केन्द्रीय विश्वविद्यालय / Central University of Karnataka
 कडगंचि, कलबुर्गी / Kadaganchi, Kalaburagi-585 367