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May 2024 (ENDSEM) EXAM

F.Y.B. TECH. (SEMESTER - II)

COURSE NAME: INSTRUMENTATION AND CONTROL Branch: Mechanical COURSE CODE:ME12234

(PATTERN 2023)

Time: [1Hr. 30 Min] **[Max. Marks: 40]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any one sub question from each Question 1 and 2 and any three sub questions each from Questions 3 and 4.**

Q. No.	Question Description	Max. Marks	CO Mapped	BT Level
Q.1	a) Explain the working of Thermocouple with suitable application	[5]	1	2
	b) Describe Dynamics Characteristic of the instruments	[5]	1	2
Q2	a) Distinguish between Stepper Motor and Servo motor	[5]	2	2
	b) Outline the working of Relay with neat sketch	[5]	2	2
Q.3	a) Illustrate the DAQ system and explain its functioning process.	[5]	3	2
	b) Explain PLC Architecture with neat sketch	[5]	3	2
	c) A bank policy in opening the bank locker are;(1) Two managers out of three must insert their key at a time along with the account holders key in a locker slot. (2)The locker security incharge can find the red light and an alarm as an indication of locker opening and He must be provided with a separate button to close the locker at any point of time Construct a ladder logic for the same.	[5]	3	3
	d) Construct a Ladder Diagram for bottle filling plant. Draw the neat sketch of the system and state its sequence of operations.	[5]	3	3
Q.4	a) Prove that for the system to be stable the K should be greater than 1 for the following characteristics equation $s^3 + Ks^2 + (K+2)s + 3 = 0$	[5]	4	3
	b) Determine the stability of the using Routh criteria $s^6 + 3s^5 + 5s^4 + 9s^3 + 8s^2 + 6s + 4 = 0$	[5]	4	3
	c) Describe Open loop control system with example	[5]	4	3
	d) Derive the equation for Closed loop Transfer Function having negative feedback	[5]	4	3

Note: [BT Level 1: Remember 2: Understand 3: Apply 4: Analyze 5: Evaluate 6: Create]