Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Examination June 2022 (2015 Scheme)

Course Code: EE404

Course Name: INDUSTRIAL INSTRUMENTATION AND AUTOMATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks. Marks

1		Draw the step response of a first order sensor. Explain the effect of time constant on the nature of response of the sensor.	(5)
2		Explain shaft torque measurement using strain gauge.	(5)
3		How can you realize a resistor using switched capacitor circuits? Explain with suitable diagram.	(5)
4		Differentiate between bulk and surface micromachining process	(5)
5		Explain shape memory alloys.	(5)
6		List any five advantages of industrial automation.	(5)
7		Explain PLC architecture.	(5)
8		Draw the PLC ladder diagrams to realize two input AND, OR and XOR gates.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	a)	Draw the block diagram representation of a process control system and explain the function of each block.	(6)
	b)	Explain the transfer characteristics of a transducer due to scale error.	(4)
10	a)	Explain the different methods of flow measurement using hot wire anemometer.	(6)
	b)	List any two advantages and disadvantages of resistive transducer.	(4)
11	a)	With the help of diagram explain the self-regulating process.	(5)
	b)	Explain digital phase detector.	(5)

PART C

Answer any two full questions, each carries 10 marks.

12	a)	With the help of a circuit diagram, explain how bridge can be linearization can be achieved using op amps.	(6)
	b)	Explain the purpose of signal conditioning in instrumentation systems.	(4)

13	a)	Explain the principle of MEMS accelerometer.	(6)
	b)	Compare virtual and traditional instrument process.	(4)
14	a)	Explain the working of Precision rectifier.	(5)
	b)	Illustrate photolithography in micromachining.	(5)

PART D

Answer any two full questions, each carries 10 marks.

15	a)	Explain the architecture of automation system.	(6)
	b)	Explain classification of control valves based on number of plugs.	(4)
16	a)	Explain architecture of SCADA with the help of a diagram.	(5)
	b)	Explain different Counter parameters of PLC	(5)
17	a)	What is the role of actuators in automation system? How are they classified based on source of energy?	(5)
	b)	What is CNC? Mention advantages and disadvantages.	(5)

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