Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

Course Code: EET468

Course Name: INDUSTRIAL INSTRUMENTATION AND AUTOMATION

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		Explain any three characteristics of transducers,	(3)
2		Explain the principle of a Resistance Potentiometer.	(3)
3		List the applications log amplifiers.	(3)
4		Write any 3 electrical control elements and its application.	(3)
5		List the advantages of virtual instrumentation systems.	(3)
6		List the key functions of process control network.	(3)
7		Discuss latching in PLC	(3)
8		Explain input elements and output elements in ladder logic.	(3)
9		Explain supervisory stations in SCADA and list its functions.	(3)
10		Describe a Remote Terminal Unit (RTU) and outline its functions.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	Sketch and explain the block diagram of process control loop in any industrial process.	(7)
	b)	Explain first order and second order time responses of a sensor with relevant sketches and write the output equations.	(7)

OR

12	a)	Explain the criteria for the selection of a transducer for an industrial application. Mention five applications of transducers.	(7)
	b)	Illustrate the principle and operation of variable reluctance tachometer.	(7)

Module II

13	a)	Explain the operation of half wave and full wave precision rectifiers with relevant circuit diagrams.	(8)
	b)	Explain phase sensitive detectors and its significance.	(6)
		OR	
14	a)	Explain the operation of any two electrical actuators with schematic diagram. Mention their industrial applications.	(8)
	b)	Illustrate hydraulic actuating systems with its components used in industries.	(6)
		Module III	
15	a)	Compare radio and wireless communication.	(6)
	b)	With the help of a block diagram explain the architecture of virtual instrumentation.	(8)
		OR	
16	a)	Discuss about process control networks used in industries.	(7)
	b)	Explain the concepts and key features of graphical programming.	(7)
		Module IV	
17	a)	Sketch the block diagram of PLC and explain various components of PLC.	(8)
	b)	Explain about various counters used in PLC.	(6)
		OR	
18	a)	Sketch the ladder diagram for realising AND & OR logic using PLC.	(8)
	b)	Explain about various timers in PLC.	(6)
		Module V	
19	a)	Explain the architecture of SCADA in process automation.	(8)
	b)	Explain different control modes in DCS operation.	(6)
		OR	
20	a)	Illustrate the components of DCS architecture for industrial process monitoring and control.	(8)
	b)	Discuss the significance and features of DNP3 and IEC 60870-5-101 protocols used in SCADA systems.	(6)

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