B

04000EE404052002

Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Supplementary Examination August 2021

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		List five applications of transducers.	(5)
2		Explain the working of hot wire anemometer with suitable diagram.	(5)
3		Realize a signal conditioning circuit to measure the output of a piezoelectric transducer using Op amp.	(5)
4		Explain the principles used in MEMS mechanical sensors.	(5)
5		Define actuators. List any two factors in the selection of actuators.	(5)
6		Explain about the shape memory alloy actuators in robotic applications.	(5)
7		What are the advantages of PLC over relay logic circuits?	(5)
8		Explain the types of counters in PLC.	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	a)	Explain the block diagram representation of a process control system.	(5)
	b)	Describe the static characteristics of a transducer.	(5)
10	a)	Explain the different types of electrical circuits used for flow measurement.	(5)
	b)	Describe how strain gauge is used for torsional measurement.	(5)
11	a)	Explain the factors influencing the choice of a transducer for an instrumentation system.	(5)
	b)	List any two electrical sensors/transducers used for the measurement of the following parameters : i)Displacement (ii) stress (ii) Flow	(5)

PART C

Answer any two full questions, each carries 10 marks.

12		Explain the principle of operation of a Phase Locked Loop with the help of a block diagram.	(10)

13 a) What is a log amplifier? (5)

b) Draw the circuit diagram of a full wave precision rectifier and explain its working. (5)

14 a) What are MEMS sensors? Explain its advantages. (5)

b) Explain the surface micromachining technique used in MEMS fabrication. (5)

PART D

Answer any two full questions, each carries 10 marks.

15 a) Discuss the principle of operation of electric actuator with suitable diagrams. (5)

b) Write the advantages and disadvantages of electric actuator. (5)

16 a) Write a simple ladder logic program for tank control system with heater and stirrer. The liquid should pumped to a required level next it should be heated and stirred for a predefined time after that it is drained out, the process is repeated continuously. (5)

b) Explain with example the working of different counters in PLC (5)

17 a) What are the basic elements of DCS in process control systems? (5)

b) Discuss the difference between PLC & DCS. (5)

****