Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

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	Explain the factors that govern the output characteristics of a transducer.	(5)
2	Explain the concept of Nano instrumentation.	(5)
3	List any five important features of instrumentation amplifiers.	(5)
4	What are the advantages and disadvantages of MEMS?	(5)
5	Explain the selection criterion for control valves?	(5)
6	Define an industrial automation system and enlist its components.	(5)
7	Compare programmable logic controller with personal computer.	(5)
8	What are the key features of DCS?	(5)

PART B
Answer any two full questions, each carries 10 marks.

9	(a)	Explain the factors influencing the choice of a transducer for an industrial instrumentation system	(6)
	(b)	Draw and explain second order sensor time response	(4)
10	a)	With the help of a diagram explain the working of an eddy current sensor.	(6)
	b)	Draw and explain the working of a capacitive differential pressure transducer.	(4)
11	a)	Draw the block diagram representation of a process control system and explain the functions of each block.	(5)
	b)	Explain the measurement of torque using strain gauges.	(5)

PART C
Answer any two full questions, each carries 10 marks.

12	a)	Explain the importance of signal conditioning in industrial instrumentation systems.	(5)
	b)	Explain the principle of operation of phase sensitive detector.	(5)
13	a)	With the help of a diagram explain the principle of MEMS accelerometer.	(5)
	b)	Differentiate between bulk and surface micromachining.	(5)

14 a) Derive an expression for the output voltage of a logarithmic amplifier and show (5)
        that it is proportional to logarithm of input voltage.

    b) Explain the concept of graphical programming in virtual instruments (5)

PART D
Answer any two full questions, each carries 10 marks.

15 a) What is the role of actuators in automation system? How they are classified? (5)

    b) How can you convert an open loop system to an automatic system? Explain (5)
        with the help of an example.

16 a) Draw the PLC ladder diagrams to realize two input AND, OR and XOR gates (5)

    b) What are the main components of SCADA? (5)

17 a) With the help of a neat diagram explain the working of butterfly valve. (5)

    b) Give the significance of timers and counters in PLC. (5)

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