Reg. No.												

Question Paper Code	12061

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Third Semester

Mechanical and Automation Engineering

20MUPW301 - SENSORS IN AUTOMATION

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Draw the functional block diagram of a measurement system.	*2,K2,CO1*
2.	Compare accuracy and precision.	*2,K2,CO1*
3.	Mention the applications of Bluetooth.	*2,K1,CO2*
4.	List out the applications of accelerometer.	*2,K1,CO2*
5.	Calculate the gauge factor of a strain gauge, if the value of resistance is 152 ohms, which changes by 5 ohms for 5000 micro strain.	*2,K2,CO3*
6.	State the difference between hydraulic and pneumatic load cell.	*2,K2,CO3*
7.	Mention the materials used for thermistors.	*2,K1,CO4*
8.	What is piezo electric effect?	*2,K1,CO5*
9.	Define environmental monitoring.	*2,K1,CO6*
10.	List out the types of data acquisition system.	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the selection criteria for the transducers.	*13,K2,CO1*
		OR	
	b)	Describe the functional elements of an instrument with its block diagram.	*13,K2,CO1*
12.	a)	Explain the working principle of Potentiometer and its types. Also state its advantages, disadvantages and applications.	*13,K2,CO2*
		OR	
	b)	Explain Ultrasonic sensor with neat schematic and state its advantages and disadvantages.	*13,K2,CO2*
13.	a)	Explain strain gauge load cell with its advantages and applications.	*13,K2,CO3*
		OR	
	b)	Describe the basic principle of hall effect sensor and show how can it be used as a magnetic field sensor?	*13,K2,CO3*

14. a) Explain the working principle of pressure diaphragm and bellows with neat sketch. *13,K2,CO4*

OR

b) Explain the construction, principle, working of thermistor and state its advantages and disadvantages. *13,K2,CO4*

15. a) How is optical fibre used for stress sensing? Describe any microbend sensor and discuss its operation. *13,K2,CO5*

OR

b) Illustrate with a neat sketch, the constructional and operation of smart sensor and outline its interface standard. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Discuss the functions of Single Channel and Multi Channel Data Acquisition System with block diagram. *15,K2,CO6*

OR

b) Discuss the importance of Environmental monitoring and explain the sensors involved in monitoring. *15,K2,CO6*