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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**

Branch: Electronics & Instrumentation Engineering **Duration: 3 hrs.**

Course Code: 23EI4PCTNI **Max Marks: 100**

Course: Transducers and Instrumentation

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)	Define the following terms as they relate to sensor technology: i. Sensor ii. Transducer iii. Sensitivity iv. Resolution v. Linearity		*CO1*	*PO1*	**10**
	b)	What are the functional elements of a measuring Instrument? Explain using relevant block diagram		*CO1*	*PO1*	**10**
		OR				
2	a)	Describe one method for measuring moisture and explain the working principle behind the sensor used.		*CO1*	*PO2*	**10**
	b)	Discuss how proper IO configuration can affect the accuracy and reliability of sensor data acquisition.		*CO1*	*PO2*	**10**
		UNIT - II				
3	a)	Discuss the advantages and disadvantages of head-type flow meters like orifice plates, venturi tubes, and flow nozzles. Support your answer with examples.		*CO2*	*PO2*	**10**
	b)	Analyze the working of a Rotameter. Discuss how it measures flow rate and the factors affecting its accuracy.		*CO2*	*PO2*	**10**
		OR				
4	a)	A turbine flow meter is used to measure the flow rate of a liquid in a pipeline. The meter works by detecting the rotational speed of the turbine blades, which are directly proportional to the flow rate. Explain how the turbine flow meter works to measure the flow rate.		*CO2*	*PO2*	**10**

		b)	Explain the principle and construction of an Electromagnetic Flow Meter. Discuss its advantages and limitations in industrial applications.	*CO2*	*PO1*	**10**
			UNIT - III			
	5	a)	Explain how a bimetallic thermometer works to measure temperature.	*CO3*	*PO1*	**10**
		b)	Evaluate the use of a thermistors in temperature measurement. Compare it with RTDs and thermistors in terms of accuracy, range, and applications.	*CO3*	*PO2*	**10**
			OR			
	6	a)	Explain why cold junction compensation is necessary when using thermocouples for temperature measurement.	*CO3*	*PO1*	**10**
		b)	Describe the construction and working of an RTD (Resistance Temperature Detector). Why is it considered accurate?	*CO3*	*PO2*	**10**
			UNIT - IV			
	7	a)	Describe the basic components of a pressure transducer and their role in the measurement process.	*CO4*	*PO2*	**10**
		b)	Describe how the McLeod gauge helps in measuring vacuum pressure and why it is suitable for very low-pressure measurements.	*CO4*	*PO2*	**10**
			OR			
	8	a)	Describe the role of the elastic transducers in pressure measurement	*CO4*	*PO2*	**10**
		b)	Describe the components of a dead weight tester and analyze their role in accurate pressure measurement.	*CO4*	*PO2*	**10**
			UNIT - V			
	9	a)	Explain the architectural view of an IoT system and how different components interact within it.	*CO5*	*PO1*	**10**
		b)	Describe the technology behind IoT, including communication protocols and sensors.	*CO5*	*PO2*	**10**
			OR			
	10	a)	Elucidate the concept of M2M communication and its importance in IoT systems.	*CO5*	*PO2*	**10**
		b)	Provide an example of IoT in a smart home and explain how it enhances daily living.	*CO5*	*PO2*	**10**

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