U.S.N.										

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

Autonomous Institute Affiliated to VTU

April 2024 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: EIE / ETE **Duration: 3 hrs.**
Course Code: 19ES3GCSAM / 22EI3PCSMT **Max Marks: 100**
Course: Sensors and Measurements / Sensors and Measurements Techniques

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.

				CO	*PO*	Marks
			UNIT - I			
1	a)		Explain the various functional elements of a measurement system	CO1	PO1	**07**
	b)		Enumerate the various types of errors encountered in an measuring instrument and explain any two.	CO3	PO2	**07**
	c)		Describe the critical performance characteristics you would consider when selecting the most appropriate measuring instrument	CO3	PO2	**06**
			UNIT - II			
2	a)		A capacitive sensor is proposed for measuring the liquid level in a tank. Explain the working principle of this sensor using a well-labeled diagram	CO2	PO2	**08**
	b)		Describe the operating principle of hygristors and illustrate their use in a specific engineering application for measuring moisture content	CO2	PO2	**07**
	c)		Discuss the working principle of piezoelectric sensor.	CO2	PO2	**05**
			OR			
3	a)		Explain the working of Hall effect sensor with the help of circuit diagrams.	CO2	PO2	**06**
	b)		Describe the working principle of an optical liquid level detector.	CO2	PO2	**06**
	c)		Explain the constructional features of LVDT and discuss any one application with suitable diagram	CO2	PO2	**08**
			UNIT - III			
4	a)		It is required to perform direct acoustic measurements for a particular application. Explain the working principle with suitable diagrams.	CO4	PO4	**08**

		b)	Explain the differences between microphones and hydrophones	CO2	PO2	**06**
		c)	Define i) Moisture ii) Dew-point iii) humidity ratio	CO1	PO1	**06**
			OR			
	5	a)	Describe the working principle of phototransistor and photodiode	CO2	PO2	**08**
		b)	Explain the operation of Scintillation detector with a photomultiplier.	CO2	PO2	**07**
		c)	Discuss the diverse applications of photoresistors	CO2	PO2	**05**
			UNIT - IV			
	6	a)	Explain the principle of operation involved in thin-film optical temperature measurement system.	CO2	PO2	**06**
		b)	Enumerate the various components of a typical contact type temperature sensor and justify its importance.	CO2	PO2	**06**
		c)	Explain the constructional features and working of pyroelectric sensor with suitable diagrams	CO2	PO2	**08**
			UNIT - V			
	7	a)	What do you mean by Seebeck effect in everyday circuits. Elaborate on the ways of mitigating the effect of Seebeck noise.	CO4	PO4	**06**
		b)	Justify how four-wire sensing improve the accuracy of remote Wheatstone bridge measurements with suitable connection diagrams?	CO3	PO2	**06**
		c)	Explain the role of interface circuits in facilitating communication between sensors and processing devices	CO3	PO2	**08**

****