Basavarajeswari Group of Institutions

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN										Course Code	2	1	E	C	5	4	4

Fifth Semester B.E. Degree Examinations, September/October 2024

SENSORS AND ACTUATORS FOR ENGINEERING APPLICATIONS

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

Q. No		*Question*	*Marks*	*(RBTL:CO:PI)*
		Module-1		
1.	**a.**	Define a sensor and an actuator. Describe their primary functions in a system.	**10**	(2:1:1.3.1)
	b.	Describe the significant role of units in measurements.	**10**	(2:1:1.3.1)
		(OR)		
2.	**a.**	What are the general requirements for interfacing sensors and actuators in a system?	**10**	(1:1:1.1.1)
	b.	Discuss the classification of sensors and actuators.	**10**	(2:1:1.2.1)
		Module-2		
3.	**a.**	Outline the units of temperature and heat and its conversion.	**10**	(2:2:1.3.1)
	b.	Indicate the Peltier Effect and Seebeck Effect.	**10**	(2:2:1.3.1)
		(OR)		
4.	**a.**	Discuss the working principle of photo-conducting sensors with neat and labelled diagrams.	**10**	(2:2:1.1.1)
	b.	Describe the working principle of CCD sensor with appropriate diagrams.	**10**	(2:2:1.2.1)
		Module-3		
5.	**a.**	Discuss the working of a capacitive fluid level sensors.	**10**	(2:3:1.2.1)
	b.	Describe the working principle of linear variable differential transformer. (LVDT)	**10**	(2:3:1.3.1)
		(OR)		
6.	**a.**	With proper diagrammatic representation, explain the working of a stepper motor.	**10**	(2:3:1.3.1)
	b.	Explain the control mechanism of an actuator using voltage and current output of a sensor.	**10**	(2:3:1.3.1)
		Module-4		
7.	**a.**	Discuss the working principle of strain gauges with equations.	**10**	(2:4:1.3.1)
	b.	Explain the concept of piezo-resistive pressure sensors with a neat diagram.	**10**	(2:4:1.3.1)
		(OR)		

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI– Performance Indicator)

8.	**a.**	Write a short note on carbon microphone with an appropriate diagram.	**10**	(1:4:1.3.1)
	b.	Explain the construction of an ultrasonic sensor with necessary diagrams.	**10**	(2:4:1.3.1)

Module-5

9.	**a.**	Discuss general schematic of a smart sensor with necessary block diagram.	**10**	(2:5:2.2.3)
	b.	Illustrate different configurations of a sensor network with appropriate diagrams.	**10**	(3:5:1.3.1)

(OR)

10	**a.**	Discuss general requirements for interfacing sensors and actuators with a microprocessor.	**10**	(2:5:1.3.1)
	b.	Indicate the different errors in sensors and actuators.	**10**	(2:5:1.3.1)

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