Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV (NEW) EXAMINATION – WINTER 2024

Subject Code:3141709 Date:26-11-2024

Subject Name:Principle of Measurement Science

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Draw and describe functional block diagram of measurement system.	**03**
	(b)	Draw 3- wire and 4- wire lead compensation technique figure for RTD	**04**
	(c)	Define temperature, pressure, flow, level, accuracy, precision and resolution.	**07**
Q.2	**(a)**	What is active and passive transducer? State an example of each.	**03**
	(b)	Answer the following: 1) State any one temperature sensor used for on/off applications. 2) State any one pressure sensor used for vacuum pressure measurement 3) State any one level sensor using hydrostatic pressure for level measurement 4) State any flow measurement technique using differential pressure measurement for flow measurement.	**04**
	(c)	Explain in detail principle and different types of thermocouple.	**07**
		OR	
	(c)	Explain in detail principle, construction, working, advantages and disadvantages of Electromagnetic flow meter	**07**
Q.3	**(a)**	Define speed of response, lag and dead zone	**03**
	(b)	Explain in detail dead weight piston gauge	**04**
	(c)	Explain the principle, operation, application, advantages and disadvantages of ultrasonic flow meter	**07**
		OR	
Q.3	**(a)**	State the three standard signals along with their range used in industries.	**03**
	(b)	How resistance is used for level measurement? Explain in detail with figure.	**04**
	(c)	Explain in detail principle, construction, working, applications, advantages and disadvantages of capacitance type level measurement	**07**
Q.4	**(a)**	Explain cold junction compensation technique in thermocouple in detail	**03**
	(b)	Define atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure	**04**
	(c)	Explain in detail principle, construction, working, applications, advantages and disadvantages of float type level measurement	**07**
		OR	
Q.4	**(a)**	Explain in detail open channel flow measurement technique	**03**
	(b)	Explain in detail level switches	**04**
	(c)	Explain in detail principle, construction, working, applications, advantages and disadvantages of capacitance type level measurement	**07**
Q.5	**(a)**	Explain in detail flapper nozzle assembly	**03**
	(b)	Explain in detail diaphragm type pressure gauge	**04**

	(c)	Explain principle, working, application, advantages and disadvantages of radiation pyrometer	**07**

OR

Q.5	**(a)**	Write a short note on selection criteria of transducer	**03**
	(b)	Classify transducers in detail	**04**
	(c)	Explain principle, working, application, advantages and disadvantages of optical pyrometer	**07**

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