Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2022

Subject Code:3141709 Date:02-07-2022

Subject Name:Principle of Measurement Science

Time:10:30 AM TO 01:00 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)**	Define metal combination of J,K,R,S and T thermocouple. Comment on thermocouple based on linearity, stability and active or passive type with reason.	**03**
	(b)	Draw and describe functional block diagram of measurement system.	**04**
	(c)	Write a short note on air purge/bubbler type liquid level measurement with construction, working and diagram.	**07**
Q.2	**(a)**	Define SI units for temperature, pressure and level measurement.	**03**
	(b)	Explain difference between variable head and area type flow meter.	**04**
	(c)	Explain McLeod gauge for vacuum measurement with neat diagram.	**07**
		OR	
	(c)	Define the vacuum pressure. Explain pirani vacuum gauge with all details	**07**
Q.3	**(a)**	Why industries use only 4-20 MA and 3 to 15 PSI as a standard range of signal.	**03**
	(b)	Explain resistive transducer in detail with necessary diagram.	**04**
	(c)	Discuss the principle and construction of orifice plate flow meter.	**07**
		OR	
Q.3	**(a)**	Explain vena contracta and stagnation point in detail.	**03**
	(b)	Explain dead weight tester in detail with necessary diagram and limitation.	**04**
	(c)	Explain pressure switch and its application in real world.	**07**
Q.4	**(a)**	With neat diagram, explain the working of 2-wire, 3-wire and 4-Wire RTD with advantages and disadvantage.	**03**
	(b)	Explain bourdon tube in detail.	**04**
	(c)	Explain LVDT with necessary diagram, advantages and disadvantages. Discuss limitation of LVDT.	**07**
		OR	
Q.4	**(a)**	Explain law of intermediate metal law with its real application.	**03**
	(b)	Explain bimetallic transducer for temperature measurement. Give one example of application of bimetallic in real word.	**04**
	(c)	Explain electromagnetic flow meter in detail with its application in industries.	**07**
Q.5	**(a)**	Explain solid level measurement.	**03**
	(b)	Explain doppler effect based flow measurement.	**04**
	(c)	Discuses criteria for selection of flow meter and design.	**07**
		OR	

Q.5	**(a)**	Explain flapper-nozzel system.	**03**
	(b)	Explain measurement of liquid level using float type.	**04**
	(c)	Explain mass flow meter in detail.	**07**

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