Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI EXAMINATION – WINTER 2025

Subject Code:3160915 Date:17-11-2025

Subject Name:Electrical Measurement and Measuring Instruments

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)**	List types of systematic error. Explain the measures taken to minimize these errors.	**03**
	(b)	Describe use of instrument transformers in the extension of range of measuring instruments.	**04**
	(c)	Explain in detail working principle and construction of LVDT. Explain how the magnitude and direction of the displacement of core of LVDT can be detected.	**07**
Q.2	**(a)**	Why PMMC instrument cannot be used for ac measurement ?	**03**
	(b)	Explain any one method for measurement of high resistance.	**04**
	(c)	Explain seebeck effect. Describe construction of thermocouple in detail with different materials used for the same.	**07**
		OR	
	(c)	Explain construction and working principle of electrodynamometer type wattmeter.	**07**
Q.3	**(a)**	Define sensor, transducer & actuator.	**03**
	(b)	A 250 : 5, CT is used along with an ammeter. If ammeter reading is 3.6 Amp, find out the line current.	**04**
	(c)	Explain working principle and construction of Piezoelectric transducer.	**07**
		OR	
Q.3	**(a)**	Describe the working and construction of resistance thermometers with different materials used for the same. Draw the resistance versus temperature characteristic.	**03**
	(b)	Explain why CT secondary should not be kept open ?	**04**
	(c)	Define the following terms : (1) True value (2) Threshold (3) Sensitivity (4) Zero drift (5) Reproducibility (6) Accuracy (7) Fidelity	**07**
Q.4	**(a)**	Draw & explain construction of PMMC instrument.	**03**
	(b)	Explain working principle of Hall effect transducer.	**04**
	(c)	Explain Maxwell's bridge with necessary diagram. Write its advantages, disadvantages. Draw phasor diagram.	**07**

OR

Q.4	**(a)**	Describe various controls of power scope.	**03**
	(b)	Draw circuit of Owen's bridge. Write its applications	**04**
	(c)	Draw circuit of Kelvin's double bridge method used for measurement of low resistance. Derive the condition for balance.	**07**
Q.5	**(a)**	Write a brief note on Megger.	**03**
	(b)	Compare Analog & digital multimeter.	**04**
	(c)	Explain construction and working of Q - meter.	**07**

OR

Q.5	**(a)**	Explain the working principle of LCR meter.	**03**
	(b)	Discuss the loss of charge method for high resistance measurement.	**04**
	(c)	Draw & explain block diagram of Digital storage oscilloscope.	**07**

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