Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3160915 Date:05-12-2023

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)**	Define the following terms : (1) True value (2) Threshold (3) Sensitivity	**03**
	(b)	Discuss different methods of measurement.	**04**
	(c)	Explain in detail working principle and construction of LVDT.	**07**
Q.2	**(a)**	Explain how strain gauges are used for the torque measurement.	**03**
	(b)	Differentiate between statistical and random errors.	**04**
	(c)	Define transducer and classify it.	**07**
		OR	
	(c)	Describe construction of thermocouple in detail with different materials used for the same.	**07**
Q.3	**(a)**	How is the instrument range extended by Instrument Transformers?	**03**
	(b)	Draw the circuit diagram of Anderson's bridge	**04**
	(c)	Explain working principle and construction of Piezoelectric transducer.	**07**
		OR	
Q.3	**(a)**	Explain working principle of Weston frequency meter.	**03**
	(b)	State different methods used to measure low, medium and high resistance	**04**
	(c)	Explain construction and working principle of 1-phase induction type energy meter.	**07**
Q.4	**(a)**	Explain why CT secondary should not be open ?	**03**
	(b)	Explain any one method for measurement of high resistance.	**04**
	(c)	Explain working of Kelvin's double bridge for measurement of low resistance with neat diagram	**07**
		OR	
Q.4	**(a)**	Explain the different principles of working of capacitive transducers.	**03**
	(b)	Draw & explain the construction of PMMC instrument.	**04**
	(c)	Describe the constructional detail of a moving iron instrument with the help of diagram. Derive the equation for defection if spring control is used	**07**
Q.5	**(a)**	Discuss the loss of charge method for high resistance measurement.	**03**
	(b)	Explain working principle of Hall effect transducer.	**04**
	(c)	Draw & explain block diagram of Digital storage oscilloscope.	**07**
		OR	
Q.5	**(a)**	Write a brief note on Megger.	**03**
	(b)	Explain the working principle of LCR meter.	**04**
	(c)	Explain measurement of unknown capacitance with the help of Schering bridge. Also draw phasor diagram.	**07**

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