Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160915 Date:06-07-2023

Subject Name:Electrical Measurement and Measuring Instruments

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)**	What is measurement? Describe different methods of measurement.	**03**
	(b)	Define errors in measurement and explain its types.	**04**
	(c)	Explain in detail working principle and construction of LVDT with detailed diagram.	**07**
Q.2	**(a)**	Classify Transducer in detail.	**03**
	(b)	Differentiate between the following transducer with suitable examples: (i) Primary and Secondary transducers (ii) Analog and Digital transducers	**04**
	(c)	Define gauge factor of a strain gauge. Derive the expression for the gauge factor.	**07**
		OR	
	(c)	Explain the construction of Thermocouple and its characteristics for various materials.	**07**
Q.3	**(a)**	Why secondary of current transformer should not be open, when primary is energized?	**03**
	(b)	How the range of dc voltmeter can be extended? Derive the expression to calculate multiplier resistance.	**04**
	(c)	Explain construction and working principle of Single-phase induction type energy meter.	**07**
		OR	
Q.3	**(a)**	Explain working principle of Weston frequency meter.	**03**
	(b)	Draw & explain construction of PMMC instrument.	**04**
	(c)	Explain construction and working principle of electrodynamometer type wattmeter.	**07**
Q.4	**(a)**	Draw and explain circuit diagram of Maxwell's bridge.	**03**
	(b)	Explain construction and working of Q - meter.	**04**
	(c)	Draw the circuit of a Kelvin's Double Bridge used for measurement of low resistance. Derive the condition for balance.	**07**
		OR	
Q.4	**(a)**	Draw and explain circuit diagram of Schering bridge.	**03**
	(b)	Draw circuit of Owen's bridge. Write its applications.	**04**
	(c)	Explain measurement of unknown inductance with the help of Hay's bridge. Also draw phasor diagram.	**07**
Q.5	**(a)**	Write a short note on: Digital recorders.	**03**
	(b)	Compare Analog & digital multimeter.	**04**
	(c)	Draw & explain block diagram of Digital storage oscilloscope. State its applications.	**07**

OR

Q.5	**(a)**	Explain the construction and working of Clamp on meter.	**03**
	(b)	Discuss the loss of charge method for high resistance measurement.	**04**
	(c)	Explain construction and working principle of Megger.	**07**

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