Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2014

Subject Code: 170803 **Date: 05-06-2014**

Subject Name: Electrical and Electronics Measuring Instruments

Time: 02:30 pm - 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.**

Q.1	**(a)**	What is measurement standard? List out different types of standard. Explain voltage standard in brief.	**07**
	(b)	Define: (1) Accuracy (2) Precision (3) Resolution (4) Sensitivity (5) Threshold (6) Drift (7) Reproducibility.	**07**
Q.2	**(a)**	Describe the various operating torque needed for proper operation of an analog indicating instrument. Draw the neat sketch & explain in detail of eddy current damping torque in analog instrument.	**07**
	(b)	Explain the construction and working of an electrodynamometer type of wattmeter.	**07**
		OR	
	(b)	A resistance of approximate value of 80 ohm is to be measured by voltmeter-ammeter method using a 1 An ammeter having resistance of 2 ohm and 50 V voltmeter having a resistance of 5000 ohm. (a) Suggest which two method should be used? (b) Supposing in the suggested method I=0.42A and V=35.5v what is the resulting error if the accuracy of the instrument is 0.5% at full scale and the error are standard deviations.	**07**
Q.3	**(a)**	Describe the working of Hay's bridge for the measurement of inductance. Derive the condition for balance and draw the phasor diagram.	**07**
	(b)	State different method for the measurement of unknown capacitance.	**07**
		OR	
Q.3	**(a)**	Explains the PMMC Type Ammeter With Torque Equation.	**07**
	(b)	Explains the electrodynamometer type low power factor wattmeter.	**07**
Q.4	**(a)**	Draw the phasor diagram & derive the expression for deflecting torque & braking torque in single phase induction type energy meter.	**07**
	(b)	Explain Maxwell's bridge for measurement of unknown inductance. Also determine condition for balance with phasor diagram.	**07**
		OR	
Q.4	**(a)**	Derive expression for unknown resistance in case of Kelvin's double bridge.	**07**
	(b)	Describe the working of Hay's bridge for the measurement of inductance. Derive the condition for balance and draw the phasor diagram	**07**
Q.5	**(a)**	Describe with the help of neat diagram the loss of charge method to determine the insulation resistance of a short length of cable and derive an expression for determination of insulation resistance.	**07**
	(b)	Explain construction and working of potential transformer. Also explain ratio and phase angle error.	**07**
		OR	

Q.5	**(a)**	Explain with the help of neat diagram the working of a digital voltmeter.	**07**
	(b)	Explain with the help of a block diagram the working of a spectrum analyzer? Where is spectrum analyzers commonly used?	**07**

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