Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER 2014

Subject Code: 160905 Date: 26-05-2014

Subject Name: Electrical and Electronic Measurement

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.**

Q.1	**(a)**	Differentiate giving suitable examples: (1) Probable errors (2) random errors (3) systematic errors	**07**
	(b)	"For the measurement of inductance of coils having very high Q factors, Hay's bridge is preferred over Maxwell's inductance capacitance bridge." Justify this statement.	**07**
Q.2	**(a)**	A Schering bridge is used for measuring the power loss in dielectrics. The specimens are in the form of discs 0.3 cm thick and have a dielectric constant of 2.3. The area of each electrode is 314 sqr. cm and the loss angle is known to be 9^0 for the frequency of 50 Hz. The fixed resistor of the network has a value of 1000 ohm and the fixed capacitance is 50 pF. Determine the variable resistor and capacitor required.	**07**
	(b)	How can the frequency be determined using a bridge? Draw this bridge and derive condition for balance. Why and how are two resistances and capacitances made equal?	**07**
		OR	
	(b)	Discuss the factors that may lead to inaccuracies in a.c. bridge measurements.	**07**
Q.3	**(a)**	Explain construction and working of a magnetic potentiometer.	**07**
	(b)	Explain Murray loop test to determine the location of cable fault.	**07**
		OR	
Q.3	**(a)**	Describe the method of determination of B-H curve of a magnetic material using method of reversals.	**07**
	(b)	Discuss the continuity test conducted on short length cables.	**07**
Q.4	**(a)**	All four resistances in a Wheatstone bridge are 1kΩ , the galvanometer has a 100 Ω resistance and 0.05 μA/mm sensitivity, and the supply is 20 V. Determine the minimum change that can be detected in the measured resistance.	**07**
	(b)	Explain construction and working of a megger.	**07**
		OR	
Q.4	**(a)**	Sketch the circuit diagram of a Wheatstone bridge showing all voltage drops and branch currents. Explain the bridge operation , and derive the balance equation.	**07**
	(b)	What is the importance of the value of Earth's resistance? What are the factors which influence its value? Describe in brief the fall of potential method for measurement of earth resistance.	**07**
Q.5	**(a)**	Derive equation for ratio and phase angle error of a current transformer.	**07**
	(b)	Explain harmonic distortion analyzer.	**07**
		OR	
Q.5	**(a)**	Explain comparison method of testing of potential transformer.	**07**
	(b)	Discuss applications of spectrum analyzer.	**07**

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