Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 170803 Date: 09/06/2012

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)**	Define and explain different types of error that may occur in measurements.	**07**
	(b)	What do you mean by low, medium, and high resistances? State various methods for measuring low resistance. Explain any one in detail.	**07**
		OR	
	(b)	An unknown resistance is measured by ammeter-voltmeter method. A voltmeter having a sensitivity of 1000 Ω/V, reads 100 V on its 150 V scale when connected across an unknown resistor in series with a milliammeter. When the milliammeter reads 5mA. Calculate (i) the apparent resistance of the unknown resistor. (ii) the actual resistance of unknown resistor. (iii) the error due to loading effect of voltmeter.	**07**
Q.3	**(a)**	What are the problems associated with high resistance? Explain any one method for measurement of insulation resistance of a cable.	**07**
	(b)	Explain Maxwell's bridge for measurement of unknown inductance. Also determine condition for balance with phasor diagram.	**07**
		OR	
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**
Q.4	**(a)**	Explain construction and working of potential transformer. Also explain ratio and phase angle error.	**07**
	(b)	Explain with neat diagram the working of digital voltmeter.	**07**
		OR	
Q.4	**(a)**	Explain theory of working of current transformer with the help of phasor diagram.	**07**
	(b)	Explain with the help of block diagram the working of spectrum analyser.	**07**
Q.5	**(a)**	What is an electrical transducer? What are the basic requirements of transducer? Give the classification of transducer.	**07**
	(b)	Explain the construction and working of strain gauge. Also derive expression of gauge factor.	**07**
		OR	
Q.5	**(a)**	Explain construction and working of L.V.D.T.	**07**
	(b)	Explain construction and working of Hall effect transducer.	**07**

****