Subject Name: Electrical and Electronics measuring Instruments

Subject code: 170803

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Date: 09/06/2012

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. What is measurement standard? List out different types of standard. Explain voltage **Q.1 07** (a) standard in brief. (b) Define: (1) Accuracy (2) Precision (3) Resolution (4) Sensitivity (5) Threshold 07 (6) Drift (7) Reproducibility (a) Define and explain different types of error that may occur in measurements. 07 **Q.2** What do you mean by low, medium, and high resistances? State various methods for **07** measuring low resistance. Explain any one in detail. An unknown resistance is measured by ammeter-voltmeter method. A voltmeter 07 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. Q.3 (a) What are the problems associated with high resistance? Explain any one method for 07 measurement of insulation resistance of a cable. (b) Explain Maxwell's bridge for measurement of unknown inductance. Also determine 07 condition for balance with phasor diagram. OR (a) Describe the working of Hay's bridge for the measurement of inductance. Derive the 07 Q.3 condition for balance and draw the phasor diagram. **(b)** State different method for the measurement of unknown capacitance. 07 Explain construction and working of potential transformer. Also explain ratio and **Q.4** (a) 07 phase angle error. **(b)** Explain with neat diagram the working of digital voltmeter. **07** OR Explain theory of working of current transformer with the help of phasor diagram. **07** 0.4 (a) 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 07 the classification of transducer. (b) Explain the construction and working of strain gauge. Also derive expression of 07 gauge factor. OR (a) Explain construction and working of L.V.D.T. **07 Q.5 (b)** Explain construction and working of Hall effect transducer. 07 *****