

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 electrodynamic 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 A 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 electrodynamic 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? **07**
Where is spectrum analyzers commonly used?
