

TEC-303

Printed Pages : 3



PAPER ID : 3075

Paper ID and Roll No. to be filled in your Answer Book

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**B. Tech.**

(SEM. III) (ODD SEM.) (REG. & BACK) EXAMINATION, 2012-13

**ELECTRONIC MEASUREMENT & INSTRUMENTATION**

Time : 3 Hours]

[Total Marks : 100

**Note :** (1) Attempt all questions.

(2) Marks are indicated at the end of each section.

**I** Attempt any four parts of the following : **5×4=20**

- (a) Differentiate between the following terminology
  - (i) Reproducibility and Drift
  - (ii) Dead Zone and Hysteresis
- (b) Discuss the advantages and disadvantages associated with capacitive transducers.
- (c) Explain the working principle of Kelvin Bridge.
- (d) Mention the merits and demerits of digital measurement over analog measurements.
- (e) Explain how measurement of high resistances can be done.
- (f) Classify transducers by taking suitable examples and mention their area of application.

2 Attempt any two parts of the following : **10×2=20**

- (a) A high resistance of  $200\text{ M}\Omega$  has a leakage resistance of  $400\text{ M}\Omega$  between each of its main terminals and the guard terminal. Find the percentage error in its measurement if the above resistance is measured by an ordinary Wheatstone bridge without providing guard circuit.
- (b) Explain the construction of Linear Variable Differential Transformer and explain how it can be used for the displacement measurement. Also discuss its advantages and disadvantages.
- (c) The output of an LVDT is connected to a  $5\text{V}$  voltmeter through an amplifier whose amplification factor is 250. An output of  $2\text{mV}$  appears across the terminals of LVDT when the core moves through a distance of  $0.5\text{ mm}$ . Calculate the sensitivity of the LVDT and that of the whole set up. The milli-voltmeter scale has 100 divisions. The scale can be read to  $1/5$  of a division. Calculate the resolution of the instrument in mm.

3 Attempt any two parts of the following : **10×2=20**

- (a) Compare and contrast the performance of successive approximation type ADC with that of counter type ADC.
- (b) Draw the block diagram of digital frequency meter. Explain its principle of operation.
- (c) Explain the working of a digital volt meter. List different types of DVVMs. How can a DVM be used to measure the current ?

4 Attempt any four parts of the following : **10×2=20**

- (a) Explain the working principle of Capacitance Bridge. Discuss its advantages and disadvantages.
  - (b) Discuss the need for input attenuation and amplification with a digital frequency meter. Draw waveforms to illustrate the errors that can be produced by noisy waveforms, and the method of dealing with them.
  - (c) Explain the working principle of Q-meter.
- 5 Write short notes on any four of the following : **5×4=20**
- (a) Spectrum Analyzer and Distortion.
  - (b) Concept of ECE and EEG
  - (c) Sampling Oscilloscopes and its application area
  - (d) Dual-slope integrating method used in A/D converter
  - (e) Electronic analog ohmmeter and multimeter
  - (f) Non-sinusoidal and function generators.