Printed Pages – 3 EEC – 403

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

PAPER ID : 0323 Roll No.

B.Tech.

(SEM IV) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

ELECTRONIC INSTRUMENTATION AND MEASUREMENTS

Time : 3 Hours *Total Marks : 100*

Note : *Attempt **all** questions.*

1. Attempt **any four** parts of the following :

(a) What do you mean by term "Accuracy" in instruments ? Differentiate it with term "Precision".

(b) The expected value of the voltage to be measured is 150 V and the measured value is 148 V. Calculate :

(i) Relative accuracy,

(ii) Absolute error.

(c) Explain various causes for instrumental errors.

(d) Write merits and demerits of PMMC instruments.

(e) Explain the working of basic DC Ammeter with suitable diagram.

(f) Explain the operation of series OHM Meter with suitable diagram.

2. Attempt **any four** parts of the following :

(a) Explain the term "loading" in voltmeter and give the method to remove the adverse effect of loading.

(b) Explain digital voltmeter with suitable diagram also write its merits and demerits in comparison to analog voltmeter.

(c) Explain various specifications of digital multimeter (DMM) which are important while selecting for any application.

(d) Draw the block diagram of dual slope type Digital Volt Meter and explain its working.

(e) Compare various techniques used in Digital Volt Meter in tabular format with parameters such as circuit complexity stability, accuracy, noise effect, and operating speed.

(f) A $3\frac{1}{2}$ digit DVM has accuracy specification of $\pm 5\%$ of the reading ± 1 digit. What is error in volts when reading is 5.00 V on its 10 V range ?

3. Attempt **any two** parts of the following :

(a) Explain Wheatstone bridge and derive the expression for bridge sensitivity.

(b) Explain practical Q-meter with suitable diagram. Also mention various sources of errors in Q-meter.

(c) Explain the operation of Capacitance Bridge in general with suitable neat diagram.

4. Attempt **any four** parts of the following :

(a) Explain the three different modes of operation of Digital Storage Oscilloscope (DSO).

(b) In an experiment, the voltage across 10 kΩ resistor is applied to CRO. On the screen, the signal appears with total vertical and horizontal occupancy of 3 cm and 2 cm respectively. The front panel controls of V/div and Time/div are 2 V/div and 2 ms/div respectively. Calculate the RMS value of voltage across resistor and its frequency.

(c) Explain the working of sampling oscilloscope with suitable diagram.

(d) Define active and passive CRO probes along with their comparison in tabular format.

(e) Discuss the loading and measurement effects on CRO probes.

(f) Discuss the specification of CRO and probes for any particular laboratory application.

5. Attempt **any two** parts of the following :

(a) Write short notes on X-Y recorders.

(b) What is importance of calibration in instrumentation ? Also mention approximate duration of regular calibration of primary and secondary instruments along with reasons.

(c) Write short notes on various types of plotters.

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