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10IT35

Third Semester B.E. Degree Examination, June 2012

Electronic Instrumentation

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Define the following terms:
i) Gross error and systematic error
ii) Absolute error and relative error **(06 Marks)**

b. Explain the working of true RMS voltmeter, with a neat block diagram. **(08 Marks)**

c. Convert a basic D′ Arsonal movement with an internal resistance of 100Ω and a full scale deflection of 10 mA into a multi range dc voltmeter with ranges from 0 – 5 V, 0 – 50 V and 0 – 100 V. **(06 Marks)**

2 a. A $4\frac{1}{2}$ digit voltmeter is used for voltage measurement:
i) Find its resolution
ii) How would 12.98 V be displayed on 10 V range?
iii) How would 0.6973 V be displayed on 1 V and 10 V range? **(07 Marks)**

b. Explain the working principle of successive approximation digital voltmeter, with the help of block diagram. **(07 Marks)**

c. With a basic block diagram, explain the method used for digital measurement of time period. **(06 Marks)**

3 a. Explain the working of dual trace oscilloscope, with a neat block diagram and necessary waveforms. **(10 Marks)**

b. With the help of basic block diagram and circuit diagram, explain the working principle of electronic switch. **(08 Marks)**

c. Briefly explain about the focus control knob available on the CRO panel. **(02 Marks)**

4 a. Describe the working of oscilloscope delayed time base system, with the help of block diagram and associated waveforms. **(10 Marks)**

b. Explain the basic operation of digital storage oscilloscope, with the help of block schematic and associated waveforms. **(10 Marks)**

PART – B

5 a. With the help of block diagram, explain the working of modern laboratory signal generator. **(10 Marks)**

b. Explain the working principle of frequency synthesizer, with a neat block diagram. **(10 Marks)**

6 a. Mention the limitations of wheatstone's bridge. Derive the balance equation for Kelvin's double bridge. **(10 Marks)**

b. A capacitance comparison bridge is used to measure a capacitive impedance at a frequency of 2 kHz. The bridge constants at balance are C_3 = 100 μF, R_1 = 10 KΩ, R_2 = 50 KΩ and R_3 = 100 KΩ. Find the equivalent circuit of the unknown impedance. **(04 Marks)**

c. Derive an expression for frequency of the wein bridge circuit. **(06 Marks)**

7 a. Explain the construction and working of bonded resistance wire strain gauge and semiconductor strain gauge. **(10 Marks)**

b. With necessary sketches, explain the construction and working principle of LVDT. **(10 Marks)**

8 a. Mention the advantages and limitations of RTD. **(04 Marks)**

b. Define the terms: i) Seebeck effect, ii) Peltier effect. **(04 Marks)**

c. Explain how bolometer bridge can be used for the measurement of power. Also discuss the application of unbalanced bolometer bridge. **(08 Marks)**

d. List the important features of LCD. **(04 Marks)**

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