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06IT35

Third Semester B.E. Degree Examination, December 2011
Electronic Instrumentation

Time: 3 hrs. Max. Marks:100

Note: ***Answer any 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 : i) Accuracy ; ii) Precision ; iii) Resolution ; iv) Significant figures. **(08 Marks)**

b. A basic D'Arsonval movement with full scale deflection current of 50 μA and 100 Ω is used in a multirange voltmeter. Design the multiplier resistance to convert into 0 – 10V and 0 – 100V range. **(06 Marks)**

c. With block schematic, explain a true rms voltmeter. **(06 Marks)**

2 a. Give the working principle of following : i) V – F type DVM ; ii) Successive approximation DVM. **(12 Marks)**

b. Explain the principle, construction and working of a digital frequency meter. **(08 Marks)**

3 a. With block diagram, explain the working of a single beam CRO. **(10 Marks)**

b. With block diagram, explain the principle and working of a dual beam CRO. **(10 Marks)**

4 a. Give the block schematic of a digital storage oscilloscope and explain them in brief. **(10 Marks)**

b. With block diagram, explain the operation of an analog storage oscilloscope. **(10 Marks)**

PART – B

5 a. Explain the construction and working of
i) AF sine and square wave generator ; ii) Function generator. **(16 Marks)**

b. Give at least four major requirements of a pulse signal generation. **(04 Marks)**

6 a. A wheat stone bridge "abcd" consists of arm ab = 1 kΩ, bc = 2.5 kΩ, cd = 10 kΩ and da = 3.5 kΩ. A 5V supply is connected across b and d. A galvanometer across a and c. Find galvanometer current. **(06 Marks)**

b. Give the circuit diagram of Maxwell's inductance – capacitance bridge and derive necessary equations of balance. **(08 Marks)**

c. An AC bridge "abcd" has the following :
Arm ab : Resistance of 10 kΩ
Arm bc : Resistance of 2 kΩ in series with c = 1 πF
Arm cd : resistance of 1 kΩ
Arm da : unknown.
Bridge is exited by an AC source of 3000 rad/s and it is connected between b and d. If the bridge is in balance, find the series equivalent inductance and resistance of unknown. **(06 Marks)**

7 a. Give five important factors to be considered while selecting a transducer. **(05 Marks)**

b. A resistance strain gauge with gauge factor of 2 is cemented to a steel beam, which is subjected to a 1 μ strain. If the original resistance of gauge is 120 Ω, find the change in resistance. **(03 Marks)**

c. Explain the following temperature transducers : i) Resistance thermometer ; ii) Thermistor. **(12 Marks)**

8 a. Write a short note on phototransistor. **(05 Marks)**

b. Explain the principle and construction of J and K type thermocouples and list their advantages. **(08 Marks)**

c. Explain the bolometric method of RF power measurement. **(07 Marks)**

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