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10IT35

Third Semester B.E. Degree Examination, June/July 2013
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. Explain with suitable example accuracy and precision. **(05 Marks)**

b. A Permanent Magnet Moving Coil instrument (PMMC) with Full Scale Deflection (FSD) of 100 μA and coil resistance is 1 KΩ is to be connected into a voltmeter. Determine the required multiplier resistance if the voltmeter is to be measure 50 V at full scale. Also calculate the applied voltage when the instrument indicates 0.8, 0.5 and 0.2 of FSD. **(08 Marks)**

c. Explain with neat circuit diagram and wave forms full wave rectifier type AC voltmeter. **(07 Marks)**

2 a. Explain basic operation of digital multimeter with neat block diagram. **(07 Marks)**

b. Suppose the converter can measure a maximum of 5 V. i.e. 5 V corresponds to the maximum count of 11111111, if the test voltage is V_{in} = 1 V. Show the steps take place in the table format in the measurement for the successive approximation type Digital Volt Meter (DVM). **(06 Marks)**

c. Explain with neat block diagram Digital Frequency Meter. **(07 Marks)**

3 a. Explain sweep or time base generator with neat circuit diagram and wave forms, for a continuous sweep CRO and triggered sweep CRO. **(12 Marks)**

b. Explain dual trace oscilloscope with neat block diagram. **(08 Marks)**

4 a. Discuss need for delayed sweep in digital storage oscilloscope. **(04 Marks)**

b. Explain basic principle of sampling oscilloscope with neat diagram and wave forms. **(06 Marks)**

c. Explain two types of storage techniques used in storage oscilloscope with neat diagram. **(10 Marks)**

PART – B

5 a. Explain with neat block diagram, operating principle of function generator. **(08 Marks)**

b. Elaborate with neat block diagram, conventional standard signal generator. **(06 Marks)**

c. Explain with neat block diagram and waveforms, frequency synthesizer in signal generators. **(06 Marks)**

6 a. Derive an expression for galvanometer current (Ig) when the wheatstones bridge is unbalanced. **(05 Marks)**

b. An unbalanced wheat stones bridge is shown in Fig. Q6 (b). Calculate current in the galvanometer. **(05 Marks)**

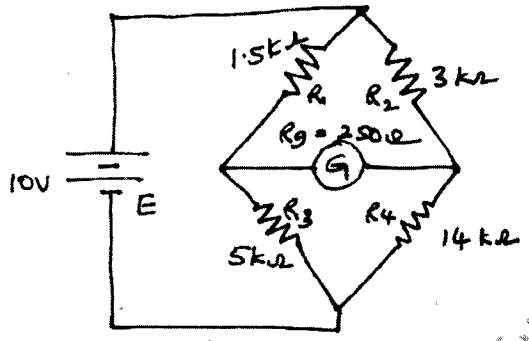

Fig. Q6 (b)

c. Derive an expression for Lx and Rx which is a series impedance in the Maxwell's bridge. And find series equivalent unknown impedance, when C_1=0.01 μf, R_1=470 KΩ, R_2=5.1 KΩ, R_3 = 100 KΩ **(10 Marks)**

7 a. List at least five advantages of electrical transducer. **(05 Marks)**

b. A displacement transducer with a shaft stroke of 3.0 inch, is applied to the circuit as shown in Fig. Q7 (b) below. The total resistance of the potentiometer is 5 KΩ, the applied voltage Vt is 5 V. When the wiper is at 0.9 inch from B. What is the value of output voltage V_0. **(05 Marks)**

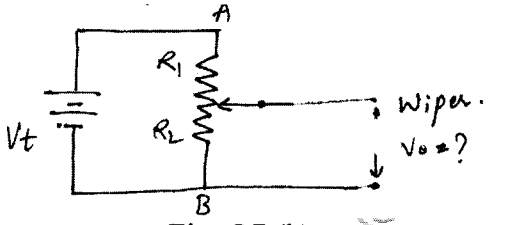

Fig. Q7 (b)

c. Define Gauge factor. Derive expression for gauge factor of bounded resistance wire strain gauge. **(10 Marks)**

8 a. Explain photo transistor. With neat diagram and output characteristics. How is it used as a transducer? **(05 Marks)**

b. List at least five classifications of digital displays. **(05 Marks)**

c. List out the requirement of a dummy load. And explain measurement of power by means of a bolometer bridge. **(10 Marks)**

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