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06EE663

Sixth Semester B.E. Degree Examination, June-July 2009
Electronic Instrumentation

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Discuss the performance characteristics of a given measuring instrument and hence list the static and dynamic characteristics. **(12 Marks)**

b. A voltmeter having a sensitivity of 1kΩ/V is connected across an unknown resistance in series with a milli-ammeter reading 80V on 150V scale. When the milli-ammeter reads 10 mA, calculate the following by neglecting the milli-ammeter resistance:
i) Apparent resistance of the unknown resistance,
ii) Actual resistance of the unknown resistance,
iii) Error due to the loading effect of voltmeter. **(08 Marks)**

2 a. With a neat block diagram, discuss the following types of voltmeters :
i) Transistor voltmeter(TVM) ii) Differential voltmeter. **(12 Marks)**

b. What are DVMs? With a support block diagram, explain the principle of voltage to frequency conversion in an INTEGRATING TYPE DVM. **(08 Marks)**

3 a. Starting from the basic circuit, develop the complete block diagram of a digital frequency meter. Also list the special techniques used to extend the frequency measurement range of such meters. **(12 Marks)**

b. What are microprocessor based instruments? Discuss with the help of a neat block diagram. **(08 Marks)**

4 a. What are recorders? List the various types of recorders used in practice. Hence discuss the X –Y recorders through a basic circuit layout. Also list the applications of X –Y recorders. **(14 Marks)**

b. The frequency of a signal to be recorded with a strip-chart recorder is 20Hz; what must be the chart speed used to record one complete cycle on 5 mm of recording paper? **(06 Marks)**

PART – B

5 a. With a support diagram showing the basic circuit elements discuss briefly the principle involved and operation of a function generator. **(08 Marks)**

b. With respect to a pulse and square –wave generator, discuss, in brief, each of the following :
i) Pulse characteristics ii) Astable multi-vibrator and its wave forms. **(12 Marks)**

6 a. What is a Q-meter? How is it used for measurement of stray capacitance? Discuss through the relevant circuit illustrations. **(08 Marks)**

b. The self capacitance of a coil is measured by using Q-meter that involves making measurements at two different frequencies as under.
I Measurement : $f_1 = 1$ MHz, $C_1 = 500$ pf ; II Measurement : $f_2 = 2$ MHz, $C_2 = 110$ pf.
Find the distributed capacitance. Also find the value of inductance, L, in μH. **(06 Marks)**

c. Giving the basic Megger circuit, discuss on the measurement of insulation resistances by using Megger. **(06 Marks)**

7 a. Explain the basic construction of a Linear Variable Differential Transformer(LVDT). Hence discuss its operating features with a support linear characteristics drawn. **(11 Marks)**

b. Write a brief note on each of the following with respect to an electrical transducer:
i) Parameters ii) Advantages iii) Selecting the transducer. **(09 Marks)**

8 Write brief explanatory note on each of the following :

a. Commonly used displays in the digital electronic field. **(05 Marks)**

b. Dot matrix displays **(08 Marks)**

c. Standard signal generator. **(07 Marks)**

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