USN

06IT35

Third Semester B.E. Degree Examination, June/July 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 terms as applied to an electronic instrument :
i) Precision
ii) Accuracy
iii) Resolution
iv) Significant figures. **(08 Marks)**

b. Explain the multirange voltmeter using multipliers connected in series string. **(06 Marks)**

c. Calculate the value of the multiplier resistance on the 50V range of a DC voltmeter that uses a 200 μA meter movement with an internal resistance of 100 Ω. **(06 Marks)**

2 a. Explain the working of dual slope type digital voltmeter, with the help of a block diagram. **(06 Marks)**

b. A 4½ digit voltmeter is used for voltage measurements
i) Find its resolution
ii) How would 12.98 V be displayed on a 10 V range?
iii) How would 0.6973 be displayed on 1V and 10 V ranges? **(06 Marks)**

c. Explain the operation of digital meter used for time measurement, with the help of block diagram. **(08 Marks)**

3 a. Explain the operation of vertical amplifier used in cathode ray oscilloscope, with the help of block diagram. **(06 Marks)**

b. With neat block diagram approach, explain the operation of dual beam cathode ray oscilloscope. **(06 Marks)**

c. Explain the operation of electronic switch used in CRO using basic block diagram, and circuit diagram. **(08 Marks)**

4 a. Explain the need for a delayed–time–base oscilloscope. Draw the block diagram of a delayed time base, and explain how it operates. **(10 Marks)**

b. Explain the basic operation of a digital storage oscilloscope, and discuss the relationship between sampling rate and bandwidth. **(10 Marks)**

PART – B

5 a. Explain the operation of conventional standard signal generator with the help of block diagram. **(06 Marks)**

b. Explain the operation of function – generator, with the help of bock diagram. **(06 Marks)**

c. Explain the operation of the frequency synthesizer uses a phase – locked – loop (PLL) system, with the help of block diagram. **(08 Marks)**

6 a. Explain the operation of the Maxwell's bridge, with a neat circuit diagram. Derive an expression for unknown values of resistance and inductance. What are the limitations of Maxwell's bridge? **(08 Marks)**

b. Find the equivalent parallel resistance and capacitance that causes a wien bridge to null with the following components (values)

$R_1 = 3.1\ k\Omega$

$C_1 = 5.2\ \mu F$

$R_2 = 25\ k\Omega$

$f = 2.5\ k\Omega$

$R_4 = 100\ k\Omega$. **(06 Marks)**

c. Write a note on Wagner's earth (ground) connection. **(06 Marks)**

7 a. Explain the operation of resistive position transducer, with neat diagram. **(06 Marks)**

b. What is resistance transducer? Explain briefly with diagram. Mention the advantages and disadvantages of the resistance transducer. **(08 Marks)**

c. Write a note on differential output transducers. **(06 Marks)**

8 a. Explain the operation of the photo–transistor with construction, symbol, output characteristics and relay circuit. **(06 Marks)**

b. Explain the operation of the measurement of power by means of bolometer bridge, with the help of suitable circuit. **(08 Marks)**

c. Write a note on light emitting diodes. **(06 Marks)**

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