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N.C.E.T. DEPT. OF LIBRARY BANGALORE-562110 2

06IT35

Third Semester B.E. Degree Examination, June / July 08
Electronic Instrumentation

Time: 3 hrs. Max. Marks:100

Note : ***1. Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. Assume any missing data.

PART A

1 a. Explain the following with example:
i) Gross Errors ii) Systematic Errors iii) Random Errors iv) Absolute Errors and v) Relative Errors. **(10 Marks)**

b. Find the voltage reading and % Error of each reading obtained with a voltmeter on i) 5 V range ii) 10 V range and iii) 30 V range, if the instrument has a 20 kΩ/V sensitivity and is connected across R_b. Comment upon the results. **(10 Marks)**

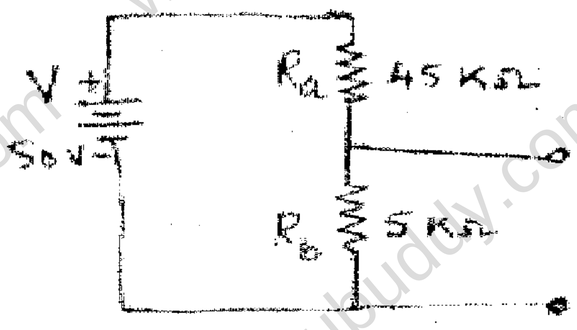

Fig.Q1(b)

2 a. With block diagram explain the principle and operation of successive approximation type DVM. Show transition diagram for 3 bit. **(10 Marks)**

b. With schematic explain the principle and operation of digital frequency meter. **(10 Marks)**

3 a. Write typical CRT connection details and explain different control knobs on the front panel of the CRO. **(10 Marks)**

b. What is the difference between Dual beam and Dual trace CRO? **(05 Marks)**

c. An electrically deflected CRT has a final anode voltage of 2000 V and parallel deflecting plates 1.5 cm long and 5 mm apart. If the screen is 50 cm from the center of deflecting plates, find: i) Beam speed, ii) The deflection sensitivity of the tube and iii) The deflection factor of the tube. **(05 Marks)**

4 a. Explain the principle and operation of sampling oscilloscope. What are its advantages and disadvantages? **(10 Marks)**

b. With block diagrams explain the principle and operation of digital storage oscilloscope. Also explain how to overcome the limitations of this oscilloscope using high performance converter. **(10 Marks)**

PART B

5 a. With block diagram explain conventional standard signal generator. **(10 Marks)**

b. Explain with a block diagram AF Sine-Square wave audio oscillator with different knobs on the front panel. **(10 Marks)**

6 a. What are the limitations of Wheatstone's Bridge? Derive the balance equation of Kelvin's Double Bridge for unknown low resistance. **(10 Marks)**

b. Four arms of an AC bridge are as follows: AB = a pure capacitance of 0.2 μF, BC = 500 Ω pure resistance, CD = unknown series circuit impedance, DA = 0.1 μF capacitance in parallel with 300 Ω resistance. Arm BD is connected with a detector and 5 V, 1000 Hz supply is connected across AC. Find unknown components value which are in series in branch CD at bridge balance condition. Write circuit diagram. **(10 Marks)**

7 a. What are the factors to be considered for the selection of better transducer? Explain. **(10 Marks)**

b. Explain the construction, principle and operation of LVDT. Show characteristic curves. How is the direction of motion determined? **(10 Marks)**

8 a. What are the different types of photoelectric transducers? Explain any two. **(10 Marks)**

b. Explain the principle of LED and RTD. Comment on their characteristics. **(10 Marks)**