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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Third Semester, B.E. – Electronics and Communications Engineering
Semester End Examination; Dec. - 2014
Measurements and Instrumentation

Time: 3 hrs   *Max. Marks: 100*

*Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each Unit.*
  ii) Assume suitable missing data if any.

Unit - I

1 a. Define three following terms as applied to an electronic instrument;   6

   i) Accuracy   ii) Prevision   iii) Resolution.

  b. Convert a basic D'arsonaval movement with an internal resistance of 50 Ω and a full scale deflection of 2 mA current into a multi range DC voltmeter with voltage ranges of 0 – 10 V, 0 – 50 V, 0 – 100 V and 0 – 250 V. Draw the multipliers connected in series with resistance values.   10

  c. With the help of neat diagram explain the principle of a successive approximation DVM.   4

2 a. Define the following terms as applied to an electronic instrument;   4

   i) Gross error   ii) Systematic error

  b. Calculate the value of multiplier resistance for the multiple range dc voltmeter (5 V, 10 V and 50V) having I_{fsd} = 50 µA, R_m = 1 kΩ.   6

  c. With the help of block diagram explain the working of a integrating type DVM.   10

Unit - II

3a. Find the current through the galvanometer of an unbalanced wheat stone bridge Fig. 3 (a).   6

  b. Find the value of R_x in the Kelvin's bridge as in Fig. 3 (b) with R_a/R_b = 1000, R_1 = 5 Ω, R_1 = 0.5 R_2.   4

  c. With the help of neat diagram explain the working of a Wein's bridge.   10

4 a. A capacitance comparison bridge is used to measure a capacitance impedance at a frequency of 2 kHz. Bridge constants at balance are C_3 = 100 µF, R_1 = 10 kΩ, R_2 = 50 kΩ, R_3 = 100 kΩ. Find the equivalent series circuit of the unknown impedance.   6

  b. With neat diagram explain the working of a Maxwell's bridge. What are its limitations, advantages and applications?   8

  c. Explain how the effect of stray capacitances in eliminated using Wagner's earth connection.   6

Unit - III

5 a. What are the parameters an electrical transducer must have? Explain.   6

  b. List eight important advantages of resistance thermisters.   8

  c. What are the advantages and limitations of thermister?   6

6 a. What are the important points to be reimbursed while selecting a transducer? Explain.   8

  b. A resistance strain gauge with a gauge factor of 2 in cemented to a steel member, which is subjected to a strain of 1×10^{-6}. If the original resistance value of the gauge in 130 Ω. Calculate change in resistance.   4

  c. List important desirable characteristics of resistance wire strain gauge.   8

Unit - IV

7 a. Write an explanatory note on Piezo electric transducer.   8

  b. What are the advantages of using LEDs in electronic displays? Explain.   8

  c. What is a basic sine wave generator?   4

8 a. List important features of LCDS.   6

  b. Explain the construction, characteristics and one application of phototransistor.   8

  c. With neat diagram explain the working of AF sine and square wane generator.   6

Unit - V

9 a. Explain the working of delayed time base oscilloscope.   10

  b. Explain the working of a frequency selective wave analyzer.   10

10 a. Write explanatory notes on:

    i) Bi stable storage CRT   10

    ii) Variable persistence storage CRT.

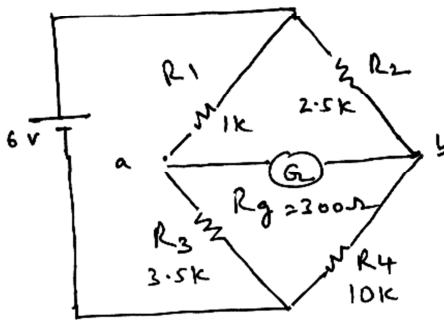 b. Explain Wien's bridge and Bridge T – Network method of harmonic distortion analyzer.   10
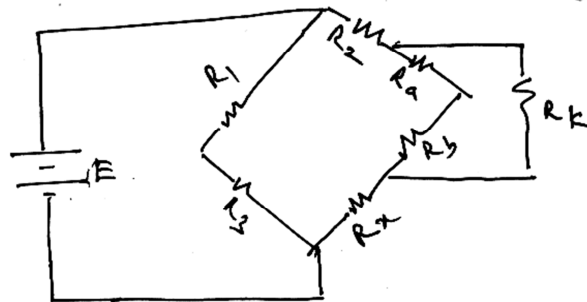

Fig 3(a)

Fig 3(b)

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