SARDAR PATEL UNIVERSITY
BSc (V Sem.) Examination
Wednesday, 20 November 2013
10.30 am– 1.30 pm
US05CELE04 – Electronics
Instrumentation I

Note: Figures to the right indicate full marks.   **Total Marks: 70**

Q.1   Multiple choice questions.

(1)   Maxwell bridge is used to find Inductance of _____.   [10]
   (i) High Q coil
   (ii) Medium Q coil
   (iii) Low Q coil

(2)   The modification applied to Hay bridge to measure high Q coil is _____:
   (i) connecting a resistor in series to capacitor in arm 1
   (ii) connecting a resistor in parallel to capacitor in arm 1
   (iii) none of above

(3)   A DC bridge can measure _____.
   (i) Unknown Capacitance
   (ii) Unknown inductance
   (iii) Unknown resistance

(4)   A bridge is said to be in balance condition when _____.
   (i) Minimum current flows through the detector
   (ii) Maximum current flows through the detector
   (iii) No current flows through the detector

(5)   The power factor of series RC combination is defined as the _____ of the phase angle of the circuit.
   (i) cotangent   (ii) cosine   (iii) none of above

(6)   The _____ is used in audio and HF Oscillators as the frequency determining element.
   (i) Schering Bridge   (ii) Wein Bridge   (iii) Hay Bridge

(7)   Which force summing device is used in capacitive transducer?
   (i) Diaphragm   (ii) Bourdon Tubes   (iii) Mass Cantilever

(8)   The capacitance of the capacitor varies _____.
   (i) Directly as distance between two conducting plates of capacitor
   (ii) Inversely as distance between two conducting plates of capacitor
   (iii) None of above

(9)   Which transducer has a very good high frequency response?
   (i) Potentiometric   (ii) Piezoelectric   (iii) Photo electric

(10) Which resistance wire has an excellent stability and high resistance to fatigue at elevated temperature?
   (i) Platinium Tungsten   (ii) Constantan   (iii) Nichrome

[20]

Q.2 Answer **Any Ten** in brief.
(1) Draw the circuit of Kelvin bridge and mention balanced condition of the same.
(2) State two conditions to be satisfied simultaneously to balance an ac bridge.
(3) Maxwell bridge is suitable for measurement of low Q coil. Explain.
(4) State applications of Wein bridge.
(5) State two differences between Hay bridge and Maxwell bridge.
(6) Draw the circuit diagram of Wein bridge circuit.
(7) Write three major elements classified by transducer and write the function of it.
(8) Write the question which can arise for the selection of transducer.
(9) Write the techniques used to reduce the measurement of error in a transducer.
(10) Explain the Piezoelectric transducer.
(11) What is function of each block of instrumentation system?
(12) Write the relation between stress and strain given by the Hooke's law.

Q.3 Draw the circuit diagram of Maxwell bridge and explain the balance [10] condition for it.

OR

Q.3 Draw the circuit diagram of Kelvin bridge and also explain [10] Kelvin double bridge for finding low value of resistance.

Q.4 Describe in detail Schering bridge and show that the dial of Schering [10] bridge can be calibrated directly in terms of dissipation factor D.

OR

Q.4 Draw the circuit diagram of Hay bridge and explain it. [10]

Q.5 Write a note on classification of transducers. [10]

OR

Q.5 Write a note on LVDT and explain the displacement measurement [10] using two differential transformers.

Q.6 Discuss in detail the thermocouple. [10]

OR

Q.6 Write a note on thermistor and also explain the characteristics of [10] thermistor.

* * *