

**SARDAR PATEL UNIVERSITY**  
**T. Y. B. Sc. (V Semester) Examination**  
**Friday, 30<sup>th</sup> November 2012**  
**2.30 p.m. to 5.30 p.m.**

**US05CELE04 : Electronics (Instrumentation - I)**

**Total Marks : 70**

Q. 1 Multiple Choice Questions. (10)

- (i) Maxwell bridge is suitable for measuring of \_\_\_\_\_.  
 (a) Medium Q coil      (b) High Q coil      (c) Low Q coil
- (ii) Kelvin bridge is used for measuring the resistance value from \_\_\_\_\_ to \_\_\_\_\_ ohm.  
 (a) 1 to 0.001      (b) 1 to 0.00001      (c) 10 to 0.0001
- (iii) Wheastone bridge is used for the measurement of unknown value of \_\_\_\_\_.  
 (a) Resistance      (b) Inductance      (c) Capacitance
- (iv) The \_\_\_\_\_ is used in audio and HF Oscillators as the frequency determining element.  
 (a) Wein Bridge      (b) Schering Bridge      (c) Hay Bridge
- (v) Schering Bridge is used for the measurement of unknown \_\_\_\_\_.  
 (a) Resistor      (b) Inductor      (c) Capacitor
- (vi) A \_\_\_\_\_ capacitor has very low losses and the phase angle is approximately 90 degree.  
 (a) MICA      (b) Ceramics      (c) Electrolytic
- (vii) Which electrical parameter is used in differential transformer?  
 (a) Inductance      (b) Capacitance      (c) Resistance
- (viii) In LVDT when the ferrite core is at the centre then the output voltage is \_\_\_\_\_.  
 (a) Maximum      (b) Minimum      (c) Equal to zero
- (ix) Thermistors are widely used in the temperature range from \_\_\_\_\_ to \_\_\_\_\_.  
 (a) 0° C to 200° C      (b) above 300° C      (c) -100° C to 300° C
- (x) The strain gage is an example of a passive transducer that convert mechanical displacement in to change of \_\_\_\_\_.  
 (a) Capacitance      (b) Resistance      (c) Inductance

Q. 2 Answer **any ten** questions in brief. (20)

- (i) Write the two balance conditions for a. c. bridge and define them.
- (ii) State the limitations of wheastone bridge.
- (iii) Why Maxwell bridge is suitable for measurement of low Q coil?
- (iv) Explain the inductive and capacitive phase angles.
- (v) Draw the circuit diagram of wein bridge circuit.
- (vi) Define the power factor and dissipation factor.
- (vii) What are the three major elements classified by transducer and state the function of each.
- (viii) State the techniques which are used to reduce the measurement of error in a transducer.
- (ix) Write the questions which can be raised for the selection of transducer.
- (x) Write the relation between stress and strain given by the Hooke's law.
- (xi) What is a piezoelectric transducer?
- (xii) What is a photoelectric transducer?

- Q. 3 (a) Explain how Kelvin double bridge is used for finding the low value of resistance. (05)  
(b) Draw the ckt of AC bridge and prove the two conditions of balance of AC bridge. (05)

**OR**

- Q. 3 (a) Draw the ckt diagram of wheastone bridge and explain the balance condition for it. (05)  
(b) Draw the ckt diagram of Maxwell bridge and explain the balance condition for it. (05)

- Q. 4 Draw the circuit diagram of Hay bridge and explain its working. (10)

**OR**

- Q. 4 Draw the ckt diagram of schering bridge and explain its working. (10)

- Q. 5 (a) Write a note on capacitive transducer. (05)  
(b) Write a note on LVDT. (05)

**OR**

- Q. 5 (a) Write a note on Inductive transducer. (05)  
(b) Write a note on classification of transducers. (05)

- Q. 6 (a) Write a note on Thermocouple. (06)  
(b) Write a note on Thermister. (04)

**OR**

- Q. 6 (a) Discuss any one application of thermister. (04)  
(b) Write a note on strain gauge. (06)

