

SEAT No. _____

No. of Printed Pages : 2

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SARDAR PATEL UNIVERSITY
B.Sc. (5th Semester) Examination
Monday, 29th October 2018
10:00 a.m. to 1:00 p.m.
US05CELE04 - Instrumentation

Total Marks : 70

Q.1 Choose the correct answer

[10]

- 1) Wheatstone bridge is used for the measurement of unknown value of _____.
(a) Resistance (b) Capacitance (c) Inductance
- 2) Maxwell bridge is used for measurement of _____.
(a) Capacitance (b) Inductance (c) Resistance
- 3) The _____ is used in audio and HF oscillators as the frequency determining element.
(a) Wein bridge (b) Schering bridge (c) Hay bridge
- 4) The power factor of series RC combination is defined as the _____ of the phase angle of the circuit.
(a) Cotangent (b) Cosine (c) None of above
- 5) The Hay bridge circuit is more convenient for measuring _____ Q coil.
(a) High (b) Low (c) Medium
- 6) In Linear Variable Differential Transformer when the ferrite core is at the center then the output voltage is _____.
(a) Maximum (b) Minimum (c) Equal to Zero
- 7) Which electrical parameter is used in differential transformer?
(a) Resistance (b) Inductance (c) Capacitance
- 8) Which resistance wire has an excellent stability and high resistance to fatigue at elevated temperature?
(a) Platinum - Tungsten (b) Constantan (c) Nichrome
- 9) Which transducer has a very good high frequency response?
(a) Piezoelectric (b) Photoelectric (c) Potentiometric
- 10) Thermistors are widely used in the temperature range from _____.
(a) -100°C to 300°C (b) 0°C to 200°C (c) Above 300°C

Q.2 Answer any TEN questions in brief

[20]

- 1) What are the limitations of wheatstone bridge ?
- 2) Maxwell bridge is suitable for measurement of low Q coil. Explain.
- 3) Write the two balance conditions for AC bridge and define them.
- 4) Define the Power factor and Dissipation factor.
- 5) What are the applications of wein bridge ?
- 6) Explain the inductive and capacitive phase angles.
- 7) Write the questions which can arise for the selection of transducer.
- 8) Give the definition of transducer and classify them.

(P.T.O.)

(1)

- 9) Write the techniques used to reduce the measurement error in a transducer.
10) Explain briefly photoelectric transducer.
11) Write the relation between Stress and Strain given by the Hooke's law.
12) What is the function of each block of instrumentation system?

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

OR

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

Q.4 Explain the working of Schering bridge with the help of necessary diagrams. [10]

OR

Q.4 Draw the circuit diagram of Wein bridge and explain its working. [10]

Q.5 (a) Draw the circuit of Capacitive transducer and explain it. [5]
(b) Draw the circuit of Inductive transducer and explain it. [5]

OR

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

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

OR

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

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