[59] Seat No.: _____ No. of printed pages: 3

SARDAR PATEL UNIVERSITY
B. Sc. (V Semester) Examination
Thursday, 24th December-2020
02.00 p.m. – 04.00 p.m.
US05CELE21 : Instrumentation

Total Marks : 70

Q 1 : Multiple Choice Questions: (10)

(1) Maxwell bridge is used to measure inductance of
- (i) Low Q coil.
- (ii) High Q coil.
- (iii) Medium Q coil.
- (iv) None of the above.

(2) Schering bridge is used to measure capacitance of a capacitor whose phase angle is
- (i) is nearer to 90°.
- (ii) is lower than 90°.
- (iii) is equal to 90°
- (iv) None of the above

(3) In Schering bridge the impedance can be approximated to be equal to
- (i) resistance
- (ii) reactance
- (iii) admittance
- (iv) conductance

(4) In switching regulator the power transistor is used as
- (i) high frequency ON/OFF switch
- (ii) Low frequency ON/OFF switch
- (iii) medium frequency ON/OFF switch
- (iv) None of the above

(5) ---------- are called dc to dc convertors.
- (i) Three terminal regulator IC
- (ii) General purpose regulator IC
- (iii) Switching regulator IC
- (iv) None of the above

(6) Transducer forms a part of _____ in instrumentation system.
- (i) Input device
- (ii) Output device
- (iii) Processing device
- (iv) conditioning device

(7) Which electrical parameter is used in differential transformer?
- (i) Resistance
- (ii) Inductance
- (iii) Capacitance
- (iv) Transformer

(8) In the construction of phototube the photosensitive material is used in construction of

(i) Anode
(ii) Cathode
(iii) Grid
(iv) Gate

(9) Thermistors are available in resistance range from
(i) 0.5 Ω to 75 M Ω
(ii) 10 Ω to 70 M Ω
(iii) 100 Ω to 75 M Ω
(iv) None of the above

(10) The piezoelectric property is found in
(i) Aluminum and Copper
(ii) Barium Titanite and Rochelle Salt
(iii) Iron and Manganese
(iv) Copper and Iron

Q2: Fill in the blanks. (04)

1. The reactance of capacitor Xc is given by ----------.
2. In linear regulator circuit power transistor is used in ---------- region.
3. The force summing device used in capacitive transducer is ----------.
4. The resistance of thermistor may decrease as much as --------- for each 1° rise in temperature.

Q2: True or False. (04)

1. At the null condition the current through the detector is maximum.
2. 79XX is a positive voltage regulator IC.
3. In LVDT when the ferrite road is at the centre then the output voltage is zero.
4. The sensitivity for constantan wire is 2.

Q.3 Answer any ten questions briefly. (20)

1. Why Kelvin bridge is called double bridge?
2. State 3 differences between ac and dc bridge.
3. What are the applications of Wein bridge?
4. What are the limitations of series regulator circuit?
5. Name the protection techniques for transistor in IC regulated power supply.
6. State applications of switching regulator IC.
7. Name the important blocks of instrumentation system?
8. Define Transducer.
9. What are force summing devices? Give example.
10. Name Asymmetrical crystalline materials.
11. What are thermistors?
12. Name the three important characteristics of thermistors.

Q.4 Long Answer question. (Answer any 4 out of 8) (32)

1. Describe in detail working of Maxwell bridge.

2. Describe in detail working of Wein bridge.
3. Describe characteristics (parameters) of a regulator IC.
4. Explain block diagram of Switching regulator IC.
5. Explain in detail Capacitive transducer.
6. Describe in detail LVDT.
7. Obtain expression for sensitivity of Strain Gauge.
8. Explain fully any two characteristics of thermistors.

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