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SARDAR PATEL UNIVERSITY

ASC (V Semester)

Course Code: US05CELE21

Instrumentation

Date: 23/11/2021, Time: 3:00 to 5:00 pm

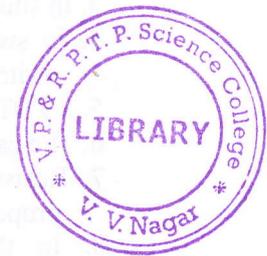
23/11/21, Tuesday

TOTAL MARKS 70

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Q. 1 Multiple Choice Questions:

1. Hay bridge is used to measure inductance of
 - (i) Low Q coil.
 - (ii) High Q coil.
 - (iii) Medium Q coil.
 - (iv) Coil whose Q factor is less than 10.
2. A bridge is said to be balanced when the current through the detector is
 - (i) minimum.
 - (ii) maximum.
 - (iii) zero.
 - (iv) Optimum
3. IC ----- is called dissipating IC
 - (i) 741
 - (ii) 723
 - (iii) 7805
 - (iv) 7905
4. In regulated power supply circuit, the rectifier circuit most commonly used is
 - (i) Half wave rectifier.
 - (ii) Full wave rectifier with two diodes.
 - (iii) Bridge rectifier.
 - (iv) None of the above
5. 79XX is a ----- regulator IC
 - (i) positive voltage
 - (ii) negative voltage
 - (iii) Neutral voltage
 - (iv) None of above
6. Transducer forms a part of _____ in instrumentation system.
 - (i) Input device
 - (ii) Output device
 - (iii) Processing device
 - (iv) Central device
7. In which transducer the emf voltage is generated across the junction of two dissimilar metals when junction is heated
 - (i) Thermistor
 - (ii) Photoconductive cell
 - (iii) Thermocouple
 - (iv) Piezo electric
8. Thermistors are widely used in the temperature range
 - (i) -100°C to 100°C
 - (ii) -100°C to 200°C
 - (iii) -100°C to 300°C
 - (iv) -200°C to 400°C
9. The piezoelectric property is found in
 - (i) Aluminium and Copper
 - (ii) Barium Titanite and Rochelle Salt



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(P.T.O.)

- (iii) Iron and Manganese
- (iv) Magnesium and Zinc

10. In phototube the large semi-circular photo sensitive element is the

- (i) Anode
- (ii) Cathode
- (iii) Gate
- (iv) source

Q2: True or False

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1. In Harmonic distortion analyser, Wein bridge is used as Notch filter.
2. An inductor has positive phase angle.
3. In shunt regulator circuit, Zener is connected in series of the load.
4. In switching regulator the power transistor is used as high frequency ON/OFF switch.
5. LVDT is an example of active transducer.
6. The capacitance of a capacitor is given by $C = KA\epsilon_0/d$
7. Resistance of resistor is directly proportional to length of wire and inversely proportional to area of wire.
8. In the construction of phototube the photosensitive material is used in construction of Anode.

Q3: Answer any 10 questions out of 12 questions briefly.

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1. Write two conditions to be fulfilled simultaneously to balance an ac bridge.
2. Draw impedance triangle for RL and RC circuit.
3. Why Maxwell Bridge is unsuited for low Q coil measurement?
4. What are the advantages of IC regulator circuit?
5. Name the protection techniques for transistor in IC regulated power supply.
6. Draw block diagram of regulated power supply.
7. Where inductive transducer is extensively used?
8. What are the important blocks of instrumentation system?
9. Classify transducer. Give two examples.
10. Where piezo electric crystals are used?
11. What are thermistors?
12. In what shapes and size the thermistors are available in the market?

Q4: Answer any 4 questions out of 8 questions elaborately.

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1. Describe in detail Kelvin double bridge 8
2. Describe in detail Schering bridge and show that the dial of Schering bridge can be calibrated directly in terms of dissipation factor D. 8
3. Describe characteristics (parameters) of a regulator IC. 8
4. Describe Switching regulator IC. 8
5. Write short note on Transducer. 8
6. Obtain expression for sensitivity of Strain Gauge. 8
7. Write short note Photo electric transducer 8
8. Explain fully any two characteristics of thermistors. 8

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