Roll No. ..... Total No. of Pages : 3

BT-4/M09 9314

Electronics Instrumentation and Measurement

Paper : ECE-202-E

Time : Three Hours] [Maximum Marks : 100

Note :- Answer completely any **FIVE** questions selecting at least **ONE** question from each unit.

UNIT–I

1. (a) Distinguish resolution and scale readability. Define threshold, repeatability and maintainability.

   (b) Write short notes on relative, systematic, and random errors.

   (c) Write short notes on Double Kelvin bridge for the measurement of low resistances. 5+6+9

2. (a) Write short notes on the general characteristics of a recording instrument, i.e., Input impedence, sensitivity, range, zero drift, and frequency response.

   (b) Describe precision measurement of medium resistance with Wheatstone bridge.

   (c) What are the limitations of Wheatstone bridge ? 5+5+10

UNIT–II

3. (a) Distinguish the difference among D' Arsonval, ballistic, and vibrating galvanometers.

   (b) Write a brief technical note on Maxwell's bridge with neat circuit and phasor diagram.

   (c) How PDM is done in magnetic tape recorders ? 5+5+10

the meter errors :- scale error, zero error, parallax error, friction error and loading effect ?

(b) Describe the X-Y recorder with all basic construction and working details.

(c) Explain the De Sauty's bridge principle for the measurement of capacitance. 5+8+7

UNIT–III

5. (a) Explain the principle and working of Q-meter.

(b) Define frequency response and gain band width, slew rate, input bias current, input offset voltage, CMRR.

(c) If CMRR is 80dB, what does it mean ? 8+10+

6. Write short notes on the following :-

(a) Wave analyser

(b) DVMs

(c) Display methods. (LED, LCD) 5+5+5+

UNIT–IV

7. (a) What are the various factors that influence the choice of transducer ?

(b) An RTD is fabricated from platinum exhibits a temperature coefficient of resistivity $\gamma_1 = 0.003702/^{\circ}C$. Assume γ_2 is negligible. If the resistance of the sensor is 100 Ω at 0°C, find the resistance of the sensor at the following temperatures :

(i) $-340^{\circ}C$ (ii) $190^{\circ}C$ (c) $500^{\circ}C$ (iii) $-220^{\circ}C$ (iv) 360°

(v) $600^{\circ}C$.

(c) What is meant by data acquisition ? Discuss data acquisition systems with the help of a block diagram with all its components.

4+6+10

8. (a) Write an engineering brief describing the several different material combinations employed in standard thermocouples.

(b) Outline the advantages associated with the case of telemetry for data transmission.

(c) Write short notes describing a system using frequency division multiplexing.

5+5+10