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EC-224 (CBCS)

B.E., III Semester

Examination, December 2017

Choice Based Credit System (CBCS)

Measurements and Instrumentation

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume any missing data, if any.

1. a) Draw the circuit diagram of Average reading AC voltmeter using semiconductor diode as half wave rectifier and explain it.
   b) Write the advantages of electronic instruments over conventional instruments.
   c) What is difference between accuracy and precision of a measuring instrument.

2. a) A voltmeter having a sensitivity of 10kΩ/V reads 180V on a 200V scale when connected across an unknown resistor. The current through the resistor is 2mA. Calculate the percentage of error due to loading effect.
   b) Give the comparison between Dual trace and Dual beam oscilloscopes.

3. a) With the help of a suitable diagram explain the function of time base generator in a CRO.
   b) Explain the following controls of a CRO :
      i) Intensity
      ii) Focus

   c) Why is delay line used in the vertical section of an oscilloscope.

4. a) Write the factors which influences choice of a transducer.
   b) Give the classification of transducers.
   c) Calculate the gauge factor of a 2mm diameter conductor that is 29mm long changes length by 1mm and diameter by 0.02mm, under a compression force.

5. a) With the help of circuit diagram, balance equation and phasor diagram explain Anderson's bridge.
   b) An a.c. bridge is balanced at 2kHz with the following components in each arm.
   Arm AB = 10kΩ
   Arm BC = 100μF in series with 100kΩ
   Arm AD = 50kΩ
   Find the unknown impedance R ± JX in the arm DC, if the detector is between BD.

6. a) Explain principle of beat frequency oscillator.
   b) Briefly explain the use of LED and LCD as display device in instrumentation.
   c) What are the advantages of digital instruments over analog instruments.

7. a) What is meant by DAC? Explain the accuracy, resolution and sensitivity of digital multimeter.
   b) Discuss ramp technique of analog to digital conversion.

8. Write short notes on the following: (any three)
   a) Chopper type DC voltmeter
   b) Loading effect
   c) Oscilloscope probes
   d) LVDT

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