B.Tech III Year II Semester (R15) Supplementary Examinations December/January 2018/19

ELECTRONIC MEASUREMENTS & INSTRUMENTATION

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define resolution and sensitivity of an instrument.
(b) What is Ohm meter?
(c) What are passive probes?
(d) What is principle of sampling?
(e) Compare fixed and variable signal generators.
(f) What is harmonic distortion?
(g) Draw the circuit of Anderson bridge.
(h) Define EMI and EMC.
(i) Compare sensor and transducer.
(j) Write about strain gauges.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) State the three types of systematic errors and explain how to minimize these errors in measurement.
(b) A resistor has a nominal value of 100Ω±1%. A voltage is applied across the resistor and the power consumed in the resistor is calculated in two ways from: (i) P = VI. (ii) P = V^2/R. Calculate the uncertainty in the power determination in each case when the measured values of V and I are V = 100V±2% and I = 1A±2%.

OR

3 (a) Explain the construction and working of a thermocouple measuring instrument. Why is it classified as an RF instrument? What are its limitations?
(b) List out salient features of AC voltmeters using rectifiers and true RMS responding voltmeter.

UNIT – II

4 (a) Give the block diagram of a CRO and explain the function of each block.
(b) What is a current probe? Explain its action.

OR

5 (a) With the help of a block diagram, explain the working of a digital storage oscilloscope.
(b) The Lissajous pattern on CRO is stationary and has 6 horizontal & 2 vertical tangencies. The frequency of the horizontal input is 3 kHz. Determine the frequency of vertical input.

UNIT – III

6 What are arbitrary waveform generators and discuss about their standards.

OR

7 (a) What is the difference between a wave analyzer and a harmonic distortion analyzer?
(b) Draw the circuit diagram and explain the working of a heterodyne type wave analyzer.

UNIT – IV

8 Explain how inductance can be measured using Maxwell's bridge with the help of neat sketch.

OR

9 (a) Describe giving the necessary theory, how you would determine the reactance of small capacitors using Q-meter.
(b) A coil was tested using a Q-meter and the following readings are obtained.
At a frequency of 3 MHz, the value of capacitance to give maximum voltage across the variable capacitor was 25 pF while at 6 MHz frequency it was 50 pF. Calculate the self capacitance of the coil.

UNIT – V

10 What are Piezoelectric transducers and explain how they will be used to measure pressure?

OR

11 (a) Explain the role of thermistors in the measurement of temperature.
(b) Write about signal conditioning circuits.

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