

B.Tech III Year II Semester (R13) Regular Examinations May/June 2016

ELECTRONIC MEASUREMENTS & INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Define any two dynamic characteristics of an instrument.
 - State the importance of sensitivity while selecting voltmeters for measurement.
 - Why delay line is used in CRO?
 - Distinguish between analog and digital storage oscilloscope.
 - What are harmonic distortion analyzers?
 - Differentiate Function generators from Signal generators.
 - Interpret the applications of Wheatstone bridge?
 - Depict Anderson bridge with its components illustrated.
 - Summarize the advantages and disadvantages of thermocouple.
 - A resistance strain gauge with gauge factor of 2 is cemented to a steel member, which is subjected to a strain of 1×10^{-6} . If the original resistance value of the gauge is 130Ω , calculate the change in resistance.

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

UNIT – I

- 2 (a) Describe about errors and its types in measurement with means adopted to minimize them.
(b) Discuss about the measurement of low resistance using shunt type ohmmeter.

OR

- 3 Draw the block diagram of multimeter and explain its operation for the measurement for voltage, current and resistance.

UNIT – II

- 4 Explain the principle of time period measurement with a basic block diagram and show how its accuracy can be improved.

OR

- 5 Elaborate the different modes of operation in Dual Trace Oscilloscope.

UNIT – III

- 6 What are wave analyzers? Brief about the wave analyzers used for RF ranges and above?

OR

- 7 (a) Describe the generation of square and pulse in laboratory type generator.
(b) Write short notes on Sweep generator.

UNIT – IV

- 8 (a) Depict the determination of Q factor of a coil using Q meters.
(b) Outline the factors that cause error during Q measurement.

OR

- 9 (a) With a suitable bridge determine the self inductance of a coil in terms of standard fixed capacitance.
(b) A Schering bridge has the following constants - Capacitor of $0.5 \mu\text{F}$ in parallel with $1 \text{ k}\Omega$ resistance in arm AB, resistance of $2 \text{ k}\Omega$ in arm AD, capacitor of $0.5 \mu\text{F}$ in arm BC and unknown capacitor C_x and R_x in series. Assume frequency 1 kHz . Determine the unknown capacitance and dissipation factor.

UNIT – V

- 10 Illustrate the operation of LVDT and explain how residual voltage is eliminated using a circuit.

OR

- 11 (a) Describe the operation of Piezo-electric transducer with neat sketches
(b) A platinum thermometer has a resistance of 100Ω at 25°C . (i) Find its resistance at 65°C if the platinum resistance temperature co-efficient of $0.00392/^\circ\text{C}$. (ii) If the thermometer has a resistance of 150Ω calculate the temperature.