

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)

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- 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  $1 \times 10^{-6}$ . If the original resistance value of the gauge is  $130 \Omega$ , 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  $1 \text{ kHz}$ . 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  $100 \Omega$  at  $25^\circ\text{C}$ . (i) Find its resistance at  $65^\circ\text{C}$  if the platinum resistance temperature co-efficient of  $0.00392/\text{C}$ . (ii) If the thermometer has a resistance of  $150 \Omega$  calculate the temperature.

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