

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

**ELECTRICAL MEASUREMENTS**

(Electrical & Electronics 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) List out the types of errors in measurement.
  - (b) What are the essential components in CRO?
  - (c) What is DC bridge? Name any two DC bridges.
  - (d) What two conditions must be satisfied to make an AC bridge balance?
  - (e) What is creeping?
  - (f) Name any four adjustments that are carried out in energy meters for correct readings.
  - (g) Define the terms transformation ratio, nominal ratio for a CT.
  - (h) Define ratio correction factor.
  - (i) Give the reasons for using ring-type specimens for ballistic tests.
  - (j) What is purpose of ballistic tests in magnetic measurements?

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

**UNIT – I**

- 2 Derive the torque of a moving iron instrument. Explain briefly the various errors in the moving iron instrument.

**OR**

- 3 Explain the internal structure of CRT with a neat diagram.

**UNIT – II**

- 4 Explain how the inductance is measured in terms of known capacitance using Maxwell's bridge.

**OR**

- 5 (a) Explain how an unknown resistance can be measured by wheatstone bridge.
- (b) A wheatstone bridge is used to measure high resistance  $S$  whose ratio arms are  $10000\ \Omega$  and  $10\ \Omega$ . The adjustable arm has a maximum value of  $10000\ \Omega$ . A battery of  $20\text{ V}$  emf and negligible resistance forms the junction ratio arms to the opposite corner. What is the maximum resistance which can be measured?

**UNIT – III**

- 6 Explain the construction and theory of electro dynamometer wattmeter.

**OR**

- 7 (a) Explain the construction of  $1 - \phi$  induction type energy meter.
- (b) Name the errors caused by the braking system in an energy meter.

**UNIT – IV**

- 8 Draw the phasor diagram of PT. Derive the expression for its transformation ratio and phase angle errors.

**OR**

- 9 Draw the equivalent circuit and phasor diagram of CT. Derive its transformation ratio.

**UNIT – V**

- 10 Describe the method for determination of B-H curve of a magnetic material using method of reversals.

**OR**

- 11 Give the construction details of flux meter.

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