

B.Tech II Year I Semester (R13) Supplementary Examinations June 2016

ELECTRICAL TECHNOLOGY

(Common to ECE and EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Compare star and delta connections.
 - (b) Draw the phasor diagram of positive and negative phase sequence.
 - (c) What is axes of DC machine? List the two types.
 - (d) Define back emf.
 - (e) A transformer has 500 primary turns and 3000 secondary turns. If the primary voltage is 240 V, determine the secondary voltage, assuming an ideal transformer.
 - (f) Define hysteresis loss.
 - (g) Define synchronous speed.
 - (h) List the advantages of wound rotor induction motor.
 - (i) Define Voltage regulation
 - (j) What is winding factor?

PART – B

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

UNIT – I

- 2 Explain any two wattmeter three phase power measurement with suitable phasor diagrams and relevant equations.

OR

- 3 Three coils each having resistance $3\ \Omega$ and inductive reactance $4\ \Omega$ are connected (i) In star. (ii) In delta to a 415 V, 3-phase supply. Calculate the following for each connection:
- (a) The line and phase voltages.
 - (b) The phase and line currents.

UNIT – II

- 4 Describe the different types of DC generators and their characteristics.

OR

- 5 Explain in detail about any two methods of DC motor speed control.

UNIT – III

- 6 Briefly explain the transformer equivalent circuit with relevant equation.

OR

- 7 (a) Derive the EMF equation of transformer.
(b) A transformer takes a current of 0.8 A when its primary is connected to a 240 volt, 50 Hz supply, the secondary being on open circuit. If the power absorbed is 72 watts, determine: (i) The iron loss current. (ii) The power factor on no-load. (iii) The magnetizing current.

UNIT – IV

- 8 Briefly explain the production of rotating magnetic field in three phase induction motor.

OR

- 9 (a) The stator of a 3-phase, 4-pole induction motor is connected to a 50 Hz supply. The rotor runs at 1455 rev/min at full load. Determine: (i) The synchronous speed. (ii) The slip at full load.
(b) Derive the torque equation for an induction motor.

UNIT – V

- 10 Briefly explain the construction and principle of salient pole generator.

OR

- 11 Draw and explain the phasor diagrams.