



B.Tech II Year II Semester (R13) Supplementary Examinations May/June 2017

ELECTRICAL TECHNOLOGY

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Derive relationship between star to delta transformation.
 - Explain applications of Millman's theorem.
 - Derive the E.M.F equation of DC generator.
 - Explain the significance of Back EMF in DC motors.
 - Explain principle of operation of single phase transformer.
 - Derive equivalent circuit of single phase transformer.
 - Define slip and explain significance of slip in three phase induction motor.
 - Explain power stages of three phase induction motor.
 - Explain principle of operation of alternator.
 - Explain constructional features of salient pole synchronous machines.

PART – B

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

UNIT – I

- 2 (a) Three similar inductive coils, each having a resistance of $20\ \Omega$ and reactance of $12.57\ \Omega$ are connected in star are fed from a $3 - \phi$, 50 Hz, 200 V supply. Calculate the line current and the power absorbed.
- (b) Three identical impedances of $(3 + j4)\ \Omega$ are connected in delta. Find an equivalent star network such that the line current is same when connected to the same supply.

OR

- 3 (a) A $3 - \phi$, 3-wire, 240 V system supplies three delta connected loads, $Z_{AB} = 25\angle 90^\circ$, $Z_{BC} = 15\angle 30^\circ$ and $Z_{CA} = 20\angle 0^\circ$. The phase sequence is ACB. Find the line currents and total power.
- (b) Derive the expression for wattmeter reading in two wattmeter method with balanced star connected load. How do you calculate the P.F of the balanced load from wattmeter reading?

UNIT – II

- 4 (a) Explain different types of DC generators.
- (b) Draw and explain magnetization and load characteristics of DC shunt generator.

OR

- 5 (a) Explain different characteristics of DC shunt motor.
- (b) Explain different methods of speed control of dc motors.

UNIT – III

- 6 (a) Explain constructional details of transformer.
- (b) Derive the EMF Equation of the transformer.

OR

- 7 Explain O.C and S.C test on single phase transformer with diagram and find the equation for regulation on transformer.

UNIT – IV

- 8 (a) Explain principle of operation of induction motor.
- (b) Explain the power stages of different losses in three phase induction motor.

OR

- 9 (a) Explain why the rotor of poly-phase induction motor can never attain synchronous speed.
- (b) Explain torque – slip characteristics of three phase induction motor.

UNIT – V

- 10 Explain voltage regulation of alternator by synchronous impedance method.

OR

- 11 (a) Explain the constructional details of alternator.
- (b) Briefly describe the coil span factor and distribution factor in alternator.
