

B.Tech II Year I Semester (R13) Regular & Supplementary Examinations December 2015

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)

- Write any four advantages of 3-phase over single phase circuits.
- Write the equivalent formulas of resistances in a star connected network.
- What is the purpose of pole cores and pole shoes in D.C. generators?
- List various losses in the D.C motors.
- Draw the phasor diagram of transformer on load.
- What is the purpose of OC test and SC test in a transformer?
- Define slip and write its formula.
- Write the expressions for maximum torque and starting torque.
- Define synchronous reactance and impedance of synchronous generator.
- List various voltage regulation methods of synchronous generators.

PART – B

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

UNIT – I

2 Explain 3-phase system in star and delta connection. Derive relation between line and phase voltages and currents.

OR

3 Explain about 2-wattmeter method and 3-wattmeter method for measurement of power in 3-phase circuits.

UNIT – II

- Derive expression for generated E.M.F equation of a generator.
- Short shunt compound generator delivers a load current of 30 A at 220 V and has armature, series-field and shunt-field resistances of 0.05 Ω , 0.030 Ω and 200 Ω respectively. Calculate the induced e.m.f and the armature current. Allow 1.0 V per brush for contact drop.

OR

5 Explain various methods of speed control of D.C shunt motors.

UNIT – III

6 Explain about transformer tests.

OR

7 The efficiency of a 1000 kVA, 110/220 V, 50 Hz, single-phase transformer is 98.5% at half full load at 0.8 p.f leading and 98.8% at full-load unity p.f. Determine: (i) Iron loss. (ii) Full load copper loss. (iii) Maximum efficiency at unity p.f.

UNIT – IV

8 Explain production of rotating field in 3-phase induction motors with necessary phasor diagram.

OR

- Derive torque equation for 3-phase induction motor under running conditions.
- Derive condition for maximum torque under running conditions.

UNIT – V

10 Explain constructional details of salient pole and round rotor machines.

OR

11 Explain about the following terms:

- Pitch factor.
- Distribution factor.