

B.Tech II Year I Semester (R13) Supplementary Examinations November/December 2016

ELECTRICAL & MECHANICAL TECHNOLOGY

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer all questions
All questions carry equal marks

PART – A
(Electrical Technology)

UNIT – I

1 Explain the internal and external characteristics of DC generator.

OR

2 (a) A 4-pole, 250 V, d.c. series motor has a wave connected armature with 200 conductors. The flux per pole is 25 mWb. When motor is drawing 60 amperes from the supply. Armature resistance is 0.15Ω and series field winding resistance is 0.2Ω . Calculate the speed under this condition.

(b) Explain torque-armature current characteristics of DC shunt and Dc series motors.

UNIT – II

3 (a) A 25 kVA 4000/200 V, 50 Hz, single-phase transformer has $R_1 = 3.45 \Omega$, $R_2 = 0.009 \Omega$, $X_1 = 5.2 \Omega$ and $X_2 = 0.051 \Omega$. Calculate the equivalent resistance and reactance referred to: (i) Primary. (ii) Secondary. Also calculate the net power loss due to winding resistance.

(b) A 200 kVA, 3300/240 V, 50 Hz single-phase transformer has 80 turns on secondary winding. Calculate: (i) Primary and secondary current on full load. (ii) Maximum value of flux. (iii) Number of primary winding turns.

OR

4 Develop exact equivalent circuit referred to primary with their referred values.

UNIT – III

5 Explain slip-torque characteristics of three phase induction motor in detail.

OR

6 Derive the E.M.F equation of a alternator.

PART – B
(Mechanical Technology)

UNIT – I

7 (a) Discuss the working of a four stroke engine with a neat sketch.

(b) Describe the working of multi stage air compressor with a neat sketch.

OR

8 (a) Discuss the working of a two stroke engine with a neat sketch.

(b) Compare two stroke and four stroke engine.

UNIT – II

9 (a) Briefly explain with a neat sketch the working of summer air conditioning system.

(b) Name the properties of good refrigerants.

OR

10 (a) Describe the working of winter air conditioning system.

(b) Briefly explain with a neat sketch, the working of vapour compression refrigeration system.

UNIT – III

11 (a) Write short notes on chain drive.

(b) Write short notes on excavators.

OR

12 (a) Write short notes on belt conveyor.

(b) Write short notes on rope drive.
