Code: 13A99301

R13

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

ELECTRICAL & MECHANICAL TECHNOLOGY

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer all questions

All questions carry equal marks

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PART – A

(Electrical Technology)

UNIT – I

1 (a) Explain the characteristics of various types of generators.

(b) Explain various types of DC Generator.

OR

2 Explain the working of a dc motor and derive the torque equation.

UNIT – II

3 (a) A 25 kVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find full-load primary & secondary currents, the secondary e.m.f and the maximum flux in the core. Neglect leakage drops and no-load primary current.

(b) Explain the construction and working principle of a transformer.

OR

4 Derive the equivalent circuit of a single phase two winding transformer.

UNIT – III

5 (a) Derive the E.M.F equation of an alternator.

(b) A 3-phase, 16-pole alternator has a star-connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 r.p.m. Find the frequency rpm and the phase and line e.m.f. Assume full-pitched coil.

OR

6 Derive torque equation of a 3-phase induction motor.

PART – B

(Mechanical Technology)

UNIT – I

7 (a) How the internal combustion engines are classified?

(b) Derive an expression for the work done by a single state reciprocating air compressor when compression is polytropic.

OR

8 (a) Discuss the working of a four stroke cycle diesel engine with the help of a neat sketch.

(b) Describe the working of a multi stage reciprocating air compressor.

UNIT – II

9 (a) Describe briefly the duct construction and duct shape.

(b) Name the properties of good refrigerant.

OR

10 (a) Explain briefly the mechanism of vapour compression refrigeration.

(b) Explain about summer air conditioning system with a neat sketch.

UNIT – III

11 (a) Briefly explain the different types of shovels with a neat sketch.

(b) Write short notes on belt conveyor.

OR

12 (a) Write short notes on bucket conveyor.

(b) Briefly explain the construction and working principle of concrete mixer.

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