

R16

Code No: 133AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech II Year I Semester Examinations, November/December - 2018****ELECTRICAL TECHNOLOGY**

(Common to ECE, ETM)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) What is the function of brushes in a d.c generator? [2]
- b) Define speed regulation of d.c. motor. [3]
- c) What are the various losses present in a transformer? [2]
- d) Draw equivalent circuit of a short circuit test. [3]
- e) Define efficiency of IM. [2]
- f) Give the application of 3- ϕ I.M. [3]
- g) What is synchronous reactance? [2]
- h) What is distribution factor? [3]
- i) Define Deflecting torque. [2]
- j) Why PMMC not measure AC quantity. [3]

PART-B

(50 Marks)

- 2.a) Explain how will you classify DC generators in detail and also explain the types of DC generators. [5+5]
- b) A 6-pole wave connected DC generator having 60 slots on its armature with 6 conductors per slot, runs at 750 rpm and generates an open circuit voltage of 230 V. Find the useful flux per pole.

OR

- 3.a) Explain the losses that occur in a DC machine.
- b) A 4-pole DC shunt generator with lap connected armature supplies a load of 100 A at 200 V. The armature resistance 0.1 ohms and the shunt field resistance is 80 ohms find the Total armature current. [5+5]

- 4.a) Derive from the fundamentals, the E.M.F equation of a single phase transformer.
- b) Draw a no load phasor diagram and explain it. [5+5]

OR

5. A 15kVA, 1-phase, 50Hz, 500/250V transformer gave following test results:
OC test (LV) side: 250V, 3.0A, 200W
SC test (HV) side: 25V, 20A, 300W
Calculate efficiency and regulation at full-load, 0.8 p.f lagging. [10]

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- 6.a) Explain construction and working principle of 3-phase Squirrel cage motor.
b) Three phase induction motor is wound for 4 – poles and is supplied from a 230V, 50 Hz supply. Calculate:

- i) The synchronous speed
ii) The speed of the motor when the slip is 2%
iii) The rotor frequency.

[5+5]

OR

- 7.a) Explain different starting methods of 3-Ø Induction motor.
b) The frequency of emf in the stator of a 4-pole induction motor is 50Hz, and that of rotor is 1.5Hz. Calculate slip and at what speed will the motor run?

[5+5]

- 8.a) Explain constructional features of alternator.

- b) How e.m.f. is induced in an 3-phase alternator? Derive the expression for e.m.f. [5+5]

OR

- 9.a) Draw the phasor diagram of the synchronous generator on load.

- b) A 50Hz alternator has a flux of 0.1 Wb/pole, sinusoidally distributed. Calculate the rms value of the emf generated in one turn of the winding, which spans 3/4 of a pole pitch.

[5+5]

- 10.a) Derive the torque equation of Moving-iron instruments.

- b) Discuss the classification of electrical instruments.

[5+5]

OR

- 11.a) Explain the construction and operation of stepper motor.

- b) Explain the construction and operation split phase 1-phase induction motor.

[5+5]

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