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.

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. [5+5]

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]

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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