PVP 14

Code: EC3T5

II B.Tech - I Semester – Regular Examinations – December 2015

ELECTRICAL TECHNOLOGY
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1. a) Give the classification of D.C generators.
   b) What is meant by critical resistance?
   c) Why a starter is required for a DC motor?
   d) What purpose does a commutator serve in d.c generators?
   e) Draw the phasor diagram of ideal transformer.
   f) What are the various components of iron losses in transformers?
   g) Define voltage regulation of a transformer?
   h) Define the terms i) slip
      ii) Slip frequency in 3-phase induction motors.
   i) Write the emf equation of an alternator.
   j) Write the basic differences between stepper motors and other rotating machines.
   k) What are the limitations of MC instruments?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Explain the Magnetization characteristics and mention the various causes for failure of the generator to build up. 8 M

b) A four pole d.c generator with a shunt field resistance of 100Ω and an armature resistance of 1 Ω has 378 wave connected conductors in its armature. The flux per pole is 0.02 Wb. If a load resistance of 10 Ω is connected across the armature terminals and the generator is driven at 1000 rpm calculate the power absorbed by the load. 8 M

3. a) Define efficiency of a transformer. Obtain the condition for maximum efficiency. 8 M

b) A 25 kVA, 2500/250V, 1- Phase transformer gave the following test figures:
O.C Test (LV Side): 250V 1.4A 105W
S.C Test (HV Side): 105V 8A 320W
Compute the equivalent circuit parameters referred to LV side and HV side. Also obtain percentage regulation at full load with 0.8 p.f lagging. 8 M

4. a) Explain briefly about principle of operation of 3-phase induction motor. 8 M

b) A 4 pole, 3 - phase induction motor operates from a supply whose frequency is 50 Hz. Calculate

i) The speed at which the magnetic field of the stator is rotating. 2 M

ii) The speed of the rotor when the slip is 0.04. 2 M

iii) The frequency of the rotor current when the slip is 0.03. 2 M

iv) The frequency of the rotor current at stand still. 2 M

5. a) Describe predetermination of regulation of an alternator from the O.C and S.C tests. 8 M

b) A 3-phase star connected alternator has 8-poles and runs at 750 rpm. It has 24 slots/phase and 10 conductors per slot, the flux being 0.055 Wb/pole. Calculate the line voltage. Assuming winding factor to be 0.96 8 M

6. What are the different types of indicating instruments? Give a brief description on the principle of indicating instruments. 16 M