Roll No .....

EX - 404

B.E. IV Semester

Examination, December 2015

Electrical Machine - I

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Define All Day Efficiency. What is its importance in transformer?

   b) Draw phasor diagram of transform under lagging power factor load condition.

   c) Show the copper saving in autotransformer as compared to two winding transformer.

   d) The single phase transformer rated 500 kVA, 3300/400V, 50 Hz has the following data:

   S.C. test: 1300W; 100V - Secondary shorted with full load current.

   O.C. test: 1000W - with rated primary voltage

   Calculate the full load regulation and efficiency at a Power Factor of 0.8 (Lag).

OR

Explain the lab method with circuit diagram to obtain the "Losses and Efficiency", of a single phase transformer.

Unit - II

2. a) Explain the clock method of angle designation of three phase transformer.
   b) Draw the phasor and connection diagram for DY1.
   c) Explain the conditions that must be fulfilled for parallel operation of three phase transformers.
   d) Scott-connected transformer supply two single phase loads at 100V. The load across the teaser is 300 kW at unity factor and that across the main secondary is 200 kW at 0.8 power factor lagging. For a three phase input voltage of 11 kV, calculate the primary line currents.

OR

Explain the pulse and high frequency transformers and their field of applications, how they are differ from normal transformer?

Unit - III

3. a) Give critical comparison between slip ring and squirrel cage induction motor in brief.
   b) Draw power flow diagram of three induction motor.
   c) Draw the torque slip characteristics of three phase induction motor.
   d) Describe the construction of circle diagram to deduce the various performance characteristics.

OR

What are the tests to be conducted to draw the circle diagram? Explain in each with lab circuit diagram.

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Unit - IV

4. a) Why you need a starter to start the three phase induction motor?
   b) How you will control the power factor the induction motor?
   c) Explain the plugging braking of the induction motor by T-speed curve.
   d) Write a short notes on the following:
      i) Induction generator
      ii) Speed control

OR

      i) Cogging and crawling
      ii) Starting of squirrel cage motors.

Unit - V

5. a) Why single phase induction motor is not self started.
   b) Draw the complete equivalent circuit of single phase induction motor.
   c) Explain the servo motors and their types in brief.
   d) Give the construction and working principle of single phase a.c. series motor. What modification are to be done to operate it on D.C. supply?

OR

Describe the construction types of LIM (Linear Induction Motor). Compare it with RIM (Rotary Induction Motor). Obtain the expression of tractive force for single sided LIM.

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