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EE/EX - 404

B.E. IV Semester

Examination, June 2013

Electrical Machine - I

Time : Three Hours

Maximum Marks : 70/100

Note: Attempt any five questions.
All questions carry equal marks.
Assume any missing data.

Unit - I

1. Give the lab. circuit diagram to perform open and short circuit diagram of single phase transformer with brief explanation and then draw the equivalent circuit diagram using data obtained from the O.C and S.C test. How you will determine the fosses from these tests.

OR

a) Explain the sumpner's test with circuit diagram.

b) Write short notes on the following in brief :

i) Auto transformer

ii) Power and distribution transformer

Unit - II

2. Explain the following in brief and write the field of applications.

i) Zap changers

ii) Pulse and high frequency transformer

iii) Conservator and breather

OR

a) Write a short note on the Scott connection

b) What are the condition to perform parallel operation of two three phase transformer explain in brief.

Unit - III

3. Draw the circle diagram for a 5.6 KW, 400 Volt, three-phase, four pole, 50 Hz, slip ring induction motor from the following data :

No load readings : 400 volt, 6 Amp,
$\cos \theta_o = 0.087$

Short circuit readings : 100 Volt, 12 Amp, 720 Watts

The ratio of primary to secondary turns = 2.62

Stator resistance per phase is 0.67 ohm and the rotor is 0.185 ohm.

Calculate :

i) Full load current

ii) Full load slip

iii) Full load power factor

iv) Maximum power

OR

a) Explain the power flow diagram of three phase induction motor.

b) Draw and explain torgue slip characteristics of the three phase induction motor.

Unit - IV

4. a) Determine approximately the starting torque of an induction motor in terms of full load torque when started by means of :

   i) A Star -delta switch

   ii) An auto transformer with 70.7% tappings.

   The short circuit current of the motor at normal voltage is 6 times the full load current and full load slip is 4%.

   b) Describe the induction generation regarding circuit and circle diagram. How it is differ from D.C shunt generator.

OR

Discuss the following in brief :

i) Cogging and crawling

ii) Double cage and deep bar induction motor

iii) Speed control of three phase induction motor

Unit - V

5. Write a short notes on the following :

   i) Linear induction motor

   ii) Single phase A.C series motor used as universal motor

   iii) Servo motor

OR

a) Explain double revolving field theory of single phase induction motor and show that Why this motor is self starting motor.

b) Describe various types of starting methods of single phase induction motor in brief with circuit diagrams only.