Code: EE4T2

II B.Tech - II Semester – Regular Examinations – May 2016

ELECTRICAL MECHINES-II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

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

11x 2 = 22 M

1)
 a) Draw the phasor diagram of ideal transformer under no-load condition?
 b) Define all day efficiency of transformer.
 c) Write the differences between transformer and induction motor.
 d) Write the necessity of parallel operation of transformers.
 e) Why a rotating magnetic field is not produced in a three phase transformer?
 f) Draw the speed-torque characteristics of deep bar and double cage induction motor.
 g) What happens to maximum torque with change in rotor resistance in induction motor?
 h) What are the disadvantages of DOL starter?
 i) Why the efficiency of induction motor is less at light load conditions?

j) Write the applications of single phase induction motor.
k) Write different types of split-phase induction motors.

PART – B

Answer any **THREE** questions.   All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2)

a) Explain the operation of transformer under load condition.

8 M

b) A 1000V, 50Hz supply to a transformer results in 650W hysteresis loss and 400W eddy current loss. If both the applied voltage and frequency are doubled, find the core losses. 8 M

3)

a) Explain load sharing of two transformers operating in parallel with equal voltage ratio. 8 M

b) Two single phase transformers with equal turns have impedances of (0.5+j3) ohms and (0.6+j10) ohms with respect to the secondary. If they operate in parallel, determine how they will share total load of 100KW at 0.8pf lagging? 8 M

4)

a) Explain the construction of three phase induction motor.

8 M

b) The starting and maximum torques of a three phase Induction motor are 1.5 times and 2.5 times its full load torque. Determine the percentage change in rotor circuit resistance to obtain a full load slip of 0.03. Neglect stator impedance.   8 M

5)

   a) Explain Star-Delta starting of induction motor.   8 M

   b) A three phase induction motor has a ratio of maximum torque to full load torque as 2.5:1. Determine the ratio of starting torque to full load torque for star-delta starting. Given $R_2 = 0.4$ ohm and $X_2 = 4$ ohm.   8 M

6)

   a) Explain cross-field theory.   8 M

   b) Explain shaded pole motor with its speed-torque characteristics.   8 M