Code: EE4T2

II B.Tech - II Semester – Regular/Supplementary Examinations – April 2019

ELECTRICAL MACHINES-II
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

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

11 x 2 = 22 M

1.

   a) Draw the no load phasor diagram for a single phase transformer.

   b) Compare core and shell type transformer.

   c) State the condition for maximum efficiency of a transformer.

   d) List the conditions to be satisfied for parallel operation of transformer.

   e) Write an expression for saving of copper when an auto – transformer is used.

   f) Define slip.

   g) Draw the equivalent circuit of 1ϕ Induction motor.

   h) Define cogging and crawling.

   i) List the applications of induction generator.

   j) Why starting methods are necessary for three phase induction motor?

   k) List the application of shaded pole induction motor.

PART – B

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

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

2. a) Derive an expression for induced e.m.f. in a transformer in terms of frequency, the maximum value of flux and the number of turns on the windings.   8 M

  b) Determine the equivalent circuit of a 200/400 V, 50 Hz, single phase transformer from the following test data:
  OC test (LV Side) : 200 V, 0.7 A, 70 W
  SC Test (HV Side): 15 V, 10 A, 85 W
  Calculate the secondary voltage when delivering 5 kW at 0.8 power factor lagging, the primary voltage being 200 V.
                    8 M

3. a) What are the distinguishing features of Y – Y and Δ – Δ three phase connections? Compare their advantages and disadvantages.   8 M

  b) Explain the concept of three phase to two phase conversion (Scott connection) with a neat circuit diagram.   8 M

4. a) Explain how the rotating magnetic field is created in three phase induction motor?   8 M

b) Explain the Torque – slip characteristics of a three phase induction motor with a neat diagram.   8 M

5. a) List the various starting methods of the three phase wound rotor and cage induction motor. Explain any one method of starting of squirrel cage type.   8 M

   b) Discuss in brief the various speed control methods of the three phase squirrel cage Induction motor.   8 M

6. a) Explain the construction and working of capacitor start-capacitor run single phase induction motor.   8 M

   b) The following test results were obtained in case of a 220 V, single phase induction motor :
      No Load test : 220 V, 6.15 A, 348 W
      Blocked rotor test : 126 V, 15 A, 577 W
      Stator winding resistance is 1.5 Ω. Determine the approximate equivalent circuit of the motor.   8 M