

Roll No. Total Pages : 4

207503

Dec., 2018

B.Tech. Vth Semester

ELECTRICAL MACHINES-III

(EE 305C)

Time : 3 Hours] [Max. Marks : 75

Instructions :

- (i) *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
- (ii) *Answer any four questions from Part-B in detail.*
- (iii) *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) What is meant by split-phase method of single phase motor starting? (1.5) CO1
- (b) Where and why is a centrifugal switch used in a split phase motor? (1.5) CO1
- (c) Why the starting torque of capacitor start induction motor is better than that of a resistance start motor? (1.5) CO1
- (d) Draw the torque-speed characteristics of synchronous reluctance motor. (1.5) CO2

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- (e) Define step angle for variable reluctance stepper motor. (1.5) CO2
- (f) Does the starting torque of a hysteresis motor have the hysteresis torque as the only component? (1.5) CO2
- (g) What type of permanent magnet materials are used for PMDC motor? (1.5) CO3
- (h) What are the important applications of permanent magnet DC motors? (1.5) CO3
- (i) How do Superconducting Motors Differ from Conventional Motors? (1.5) CO4
- (j) What are the advantages of energy efficient machines? (1.5) CO4

PART-B

2. (a) Explain double revolving field theory for single phase induction motors. (8) CO1
- (b) Describe the constructional features and operating characteristics of a shaded pole induction motor. (7) CO1
3. (a) The test results of a 230 V, single phase induction motor are given below :

Blocked rotor test	: 110 V,	9.5 A,	450 W
No-load test	: 230 V,	4.4 A,	120 W

 The starting winding is kept open during blocked rotor test and stator winding resistance is 1.4 Ω . Find the equivalent circuit parameters and the core, friction and windage losses. (8) CO1

- (b) Describe the construction of a synchronous hysteresis motor and show that it develops a running torque both at synchronous and asynchronous speed of the motor. (7) CO2

4. (a) What happen when a DC series motor connected with single phase AC supply? What modifications are necessary to operate a DC series motor satisfactorily on single phase AC supply? (8) CO2
- (b) Explain the operating principle of linear induction motor. Draw its characteristics. State its important applications. (7) CO3
5. (a) Describe the construction of a permanent magnet DC (PMDC) motor. What are the advantages and disadvantages of PMDC motors compared with conventional DC shunt motor? (8) CO3
- (b) Name three types of stepper motors and explain any one in detail. (7) CO2
6. (a) Describe the salient features of the construction of Schrage motor. Discuss how the speed and power factor can be varied by an emf injected into its secondary winding. (8) CO3
- (b) What is an energy efficient machine? What are the factors affecting efficiency? What are the constructional difference between energy efficient machine and conventional machines? (7) CO4

7. Write short note on :

- (a) Super conducting AC machine.
- (b) Multiple winding transformer. (15) CO4