



C14-EE-502

4637

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**OCT/NOV—2017**  
**DEEE—FIFTH SEMESTER EXAMINATION**  
**AC MACHINES—II**

Time : 3 hours ]

[ Total Marks : 80

---

**PART—A**

3×10=30

**Instructions** : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Explain briefly why synchronous motor is not self-starting.
2. What is meant by hunting in a synchronous motor?
3. An 8-pole, 750 r.p.m. alternator supplies power to an 8-pole, 3-phase induction motor. Find the full load speed when the slip is 4%.
4. What is the necessity of starters in case of three-phase induction motors?
5. State any four applications of three-phase induction motors.
6. List the classification of single-phase motors.

- \* 7. State the methods of reversal of rotation of capacitor start capacitor run induction motor.
8. State the necessity of an auxiliary winding in a single-phase capacitor motor.
9. State any three applications of brushless d.c. motor.
10. What is a universal motor?

**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.  
 (2) Each question carries **ten** marks.  
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Explain the working principle of synchronous motor. 5  
 (b) List out the applications of synchronous motor. 5
12. A 400-V three-phase supplies a 500-kVA load at 0.5 PF lagging. A synchronous motor supplying an active load of 74.6 kW at an efficiency of 0.87 is used to improve the overall power factor to 0.9 lagging. Find (a) kVA rating of synchronous motor and (b) power factor at which the synchronous motor is working.
13. Derive the relationship among rotor input, rotor copper loss and mechanical power developed in case of 3-phase induction motor.
- \* 14. The star connected rotor of an induction motor has a stand still impedance of  $0.4 + j4$  ohms per phase and rheostat impedance of  $6 + j2$  ohms per phase. The motor has an induced e.m.f. of 80 V between sliprings at standstill. When connected to its normal voltage. Find (a) rotor current at standstill with the rheostat in circuit and (b) when sliprings are short circuited and motor running at 3% slip.

- \* 15. Explain the operation of rotor resistance starter with a diagram.
16. (a) Draw the equivalent circuit of three-phase induction motor in comparison with transformer. 5
- (b) Calculate the torque exerted by an 8-pole, 50-Hz, 3-phase induction motor operating with a 4% slip which develops a maximum torque of 150 kg-m at a speed of 660 r.p.m. The resistance per phase of the rotor is 0.5 . 5
17. (a) Explain the working of split phase motor with a neat diagram. 6
- (b) State the applications of shaded pole motor. 4
18. Explain the construction and working principle of stepper motor with a neat diagram.

\*\*\*