



C09-EE-603

3764

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2017
DEEE—SIXTH 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. List the main parts of a synchronous motor.
2. Define V and inverted V curves of a synchronous motor.
3. State why the synchronous motor is not self-starting machine.
4. Compare synchronous motor with induction motor in any three aspects.
5. State the working principle of induction motor.
6. State the need of starter in case of 3-phase induction motor.
7. State the function of centrifugal switch in single-phase motor.

- * 8. State the method of reversal of rotation of shaded pole motor.
9. State different types of single-phase induction motors.
10. State the types of stepper 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. Explain how overexcited synchronous motor takes leading p.f.

12. Explain the starting of synchronous motor by damper winding.

13. (a) Explain with the help of power-flow diagram, how electrical input is converted into mechanical power output in an induction motor. 5

(b) The rotor resistance and standstill reactance per phase at a 3-phase slip-ring induction motor are 0.02 and 0.1 respectively. What should be the value of the external resistance per phase to be inserted in the rotor circuit to give maximum torque at starting? 5

14. A 3-phase, 50-Hz induction motor draws 50 kW from the mains. If the stator loss is 2 kW and the rotor e.m.f. observed to make 100 complete oscillations per minute, determine (a) rotor copper loss and (b) mechanical power developed.

* 15. Draw the circle diagram for a 5.6-kW, 400-V, 3, 4-pole, 50-Hz, slip-ring induction motor from the following data :

No-load test : 400 V, 6 A, $\cos \phi_0 = 0.087$

SC test : 100 V, 12 A, 720 W

The ratio of primary to secondary turns = 2.62

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Stator resistance per phase is 0.67 and rotor is 0.185 .
Calculate—

- (a) full-load current;
 - (b) full-load slip;
 - (c) full-load power factor;
 - (d) maximum power.
- 16.** Explain with neat sketch, the following speed control methods of 3- induction motor :
- (a) By changing the stator poles
 - (b) By rotor e.m.f. injected method
- 17.** Explain the working of 1- capacitor-start capacitor-run induction motor operation with neat diagram.
- 18.** Explain the construction and working principle of a universal motor.

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