



C16-EE-502

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BOARD DIPLOMA EXAMINATION, (C-16)
OCT/NOV—2018
DEEE—FIFTH SEMESTER EXAMINATION

A.C. 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. State why the synchronous motor is not self starting machine.

2. List any three disadvantages of synchronous motor.

3. What is the need of starter in case of 3-phase induction motor?

4. A 3-phase induction motor has 2 poles and is connected to 400-V, 50-Hz supply. Determine the actual rotor speed when the slip is 4%.

5. Why does the single-phase induction motor need an auxiliary winding?

6. List the applications of stepper motor.

- * 7. Define an electric drive and list various components of it?
- 8. List the types of load for drives based on the time of operation.
- 9. What is regenerative braking?
- 10. List any six advantages of electric braking.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

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

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. A synchronous motor absorbing 40 kW is connected in parallel with a load of 300 kW having a power factor of 0.85 lagging. If the combined load should have power factor of 0.9 lagging, how much leading kVAR should be supplied by the synchronous motor?

12. (a) Explain 'V' and 'Inverted V' curves of synchronous motor.

(b) Derive the relation between rotor full load torque and maximum torque?

13. The power input to a 500-V, 50-Hz. 6 pole, 3-phase induction motor running at 975 rpm is 40 kW. The stator losses are 1 kW and the friction and windage losses total 2 kW. Calculate (a) The slip, (b) The rotor copper loss, (c) shaft output, and (d) The efficiency.

14. Explain the speed control methods of 3-phase induction motor with neat sketch—

(a) by changing the supply frequency;

(b) by cascade connection.

15. Explain the construction and working of split phase induction motor with a neat diagram.

- * 16. Explain the working of single-phase AC series motor with a neat diagram.
17. A motor works on 2 minutes load cycle constituted as follows :
0 to 15 sec : load rising from 0 to 1260 HP
15 to 85 sec : constant load of 720 HP
85 to 95 sec : regenerative braking with the HP returned falling uniformly from 240 to 0 HP.
95 to 120 sec : motor is at rest
Determine the continuous rating of the motor that would be suitable for the load cycle. Assume the rating to depend upon—
(a) the rms value of loading;
(b) the average value.
18. Explain the following electrical banking systems applied to DC shunt motor :
(a) Plugging
(b) Rheostatic
