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C16-EE–502

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BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

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. List the applications of synchronous motor.

3. State any four applications of 3-phase induction motor.

4. Draw torque-slip curves of 3-phase induction motor.

5. List any three applications of shaded-pole induction motor.

6. State the method of reversal of rotation of single-phase capacitor start motor.

7. Classify the drives based on their application.

8. Explain the need of load equalization.

9. Write any three advantages of electric braking over other forms of brake.

10. What is the plugging method of electrical braking?

PART—B

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

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

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

11. State the starting methods of synchronous motor. Explain any one of them in detail. 10

12. *(a)* Explain 'V' and 'Inverted V' curves of synchronous motor. 5

(b) Derive the relation between rotor full load torque and maximum torque of 3-phase induction motor. 5

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 total friction and windage losses are 2 kW. Calculate *(a)* the slip, *(b)* the rotor copper loss, *(c)* shaft output and *(d)* the efficiency. 10

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

(a) by changing the supply frequency;

(b) by cascade connection. 5+5

15. Explain the operation of resistance start split-phase single-phase induction motor with neat diagram. 10

16. Explain the construction and working principle of an universal motor. 10

17. A motor has following duty cycle :

100 HP for 10 minutes

No- load for 5 minutes

60 HP for 8 minutes

No- load for 4 minutes

The duty cycle is repeated indefinitely. Determine the suitable size of continuously rated motor. 10

18. Explain the rheostatic braking applied to DC shunt motor with a neat diagram. 10

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