C09–EE–603

3764

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2016

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. Draw the V curves of a synchronous motor at full load and half full load.   1½+1½=3

2. State the main parts of synchronous motor.

3. Draw the phasor diagram of synchronous motor at *(a)* lagging power factor and *(b)* leading power factor.   1½+1½=3

4. State the working principle of induction motor.

5. A 12-pole, 50 Hz, 3-phase induction motor runs at 485 r.p.m. What will be the frequency of the rotor current?

6. Compare synchronous motor with induction motor in any three aspects.

7. State the applications of shaded pole motors.

8. State any three applications of capacitor start capacitor run induction motor.

9. Explain how the reversal of rotation is obtained in 1- induction motor.

10. State any three applications 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. A synchronous motor absorbing 60 kW is connected in parallel with a factory load of 240 kW having a lagging p.f. 0·8. If the combined load has power factor of 0·9 lag, what is the leading KVAR supplied by the motor and at what power factor is it working?

12. A 3- , 400 V star-connected synchronous motor has a back e.m.f. of 350 V, leading 150 electrical degrees over the applied voltage. The resistance and reactance per phase are 0·25   and 3·2   respectively. Find *(a)* the current and *(b)* the p.f. at which the motor is operating.

13. *(a)* Derive the condition to get a maximum starting torque under full-load conditions of a 3- induction motor.

(b) A 3- , 6-pole, 400 V induction motor takes a line current of 40 A at 0·8 p.f. and runs at 950 r.p.m. Find its efficiency and output if the frictional losses are 4 kW and stator losses are 30 kW.

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

(a) by changing the supply frequency;

(b) by cascade connection.   5+5=10

15. The rotor e.m.f. of a 3-phase, 6-pole, 400 V, 50 Hz induction motor alternates at 3 Hz. Compute the speed and percentage slip of the motor. Find the rotor copper loss per phase if the full input to the rotor as 111·9 kW.

16. Explain the operation of autotransformer starter with a diagram.

17. Explain resistance-start split-phase single-phase induction motor operation with neat diagram.

18. Explain the construction and working principle of universal motor with neat diagram.

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