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C14–EE–**502**

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BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—2018
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. Draw the power flow diagram of synchronous motor.

2. What is synchronous condenser and where is it used?

3. Derive the condition for staring torque to be maximum in 3-phase induction motor.

4. Compare squirrelcage and slip ring induction motor in any three aspects.

5. List the applications of 3-phase induction motor.

6. Why a 1-phase induction motor is not self starting?

7. Draw the circuit diagram of a 1-phse capacitor start capacitor run induction motor.

8. State the method of reversal of rotation of shaded pole motor.

9. Write any three applications of stepper motor.

10. Write any three applications of universal motor.

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)* Explain the effect of excitation on armature current and power factor of synchronous motor with phasor diagrams.

(b) A 400V, 3-phase, star-connected synchronous motor has a resistance of 0.3 /phase and synchronous reactance of 2.4 /phase. The motor is operating at 0.8 p.f. leading taking a line current of 80A. Determine the value of generated emf per phase and also its line value.

12. Explain the starting methods of synchronous motor with neat diagrams.

13. *(a)* Compare synchronous motor and induction motor.

(b) A 50Hz, 8-pole induction motor has a full load slip of 4%. The rotor resistance and reactance are 0.01 and 0.01 per phase respectively. Find the ratio of maximum to full load torque and speed at which the maximum torque occurs.

14. A 220V, 50Hz, 7460W, 3-phase induction motor with star connected stator having a winding ratio of unity. The stator resistance of 0.38 /phase and a rotor resistance of 0.24 /phase. The test results are No-load test : 220V,9.7A, p.f.=0.195
     Blocked rotor rest : 100V, 47.6A, p.f.=0.454

Draw the circle diagram and find *(a)* Full load current, *(b)* Power factor.

15. *(a)* Explain with a neat diagram cascade method of speed control of 3-phase induction motor.

   (b) The rotor of 3-phase, 6-pole, 400V, 50Hz induction motor alternates at 3Hz. Compute the speed and percentage of slip of the motor. Find the rotor copper loss per phase if full load input to the rotor is 111 kW.

16. Explain the working operation of DOL starter, Star-Delta starter of a 3-phase induction motor with a neat diagram.

17. Explain the construction and working of a single-phase shaded pole induction motor and mention its applications.

18. Explain the construction and working of a stepper motor with neat diagram.

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