



C14-EE-502

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BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2017
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. How is hunting prevented in a synchronous motor?
2. Draw V and inverted V curves of synchronous motor.
3. A 6-pole, 50-Hz induction motor has a slip of 2.5%. Find its actual speed and slip speed.
4. Enumerate different losses in an induction motor.
5. State any four applications of 3-phase induction motors.
6. List different types of single-phase induction motor.
7. Draw the diagram of capacitor star induction motor.

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8. State the necessity of an auxiliary winding in a single-phase capacitor motor.
9. State the basic concept of a stepper motor.
10. List the applications of universal 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) Draw power flow diagram of synchronous motor. 4
 (b) The synchronous reactance per phase of a 3-phase star-connected 6600 V synchronous motor is 20 . For certain load, the input is 915 kW at normal voltage and the induced line e.m.f. is 8942 V. Calculate the line current and power factor. Neglect resistance. 6
12. (a) State the main parts of synchronous motor. 4
 (b) Explain the starting of synchronous motor using damper winding. 6
- * 13. (a) Distinguish between induction motor and transformer. 5
 (b) Explain the working principle of 3-phase induction motor. 5
14. (a) Define the following : 4
 (i) slip
 (ii) slip speed
 (b) The power input to a motor is 65 kW. The total stator loss is 1.5 kW. Find the rotor copper loss per phase if the motor is running with a slip of 4%. 6

15. (a) Compare ^{*} between synchronous and 3-phase induction motors. 4
- (b) A 50 Hz, 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. 6
16. A 200 V, 50 Hz, 7460 watts, 3-phase induction motor with star-connected stator having a winding ratio of unity. The stator resistance of 0.38 /phase and rotor resistance of 0.24 /phase. The test results are
- no. load test : 200 V, 7.7 A, PF = 0.195
- Blocked rotor test : 100 V, 47.6 A, PF = 0.454
- Drawing the circle diagram and find (a) FL current and (b) power factor. 10
17. (a) Explain the working of a split-phase induction motor with neat sketch. 7
- (b) What are the applications of split-phase induction motor? 3
18. (a) Explain the construction and working of universal motor. 7
- (b) List the applications of stepper motor. 3

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