



C09-EE-603

3764

BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2014
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. State the starting methods of synchronous motor.
2. State how hunting is prevented.
3. Draw the vector diagrams of overexcited and underexcited synchronous motors and name all the component vectors and angles on it.
4. The rotor speed of a 6-pole, 50 Hz induction motor is 960 r.p.m. Calculate the percentage slip.
5. State the need of starter in case of 3-phase induction motor.
6. State the factors which effect the speed control of induction motor.

7. * State the method of reversal of rotation of capacitor start motor.
8. State any three applications of shaded pole 1- induction motor.
9. Draw the circuit diagram of a 1- capacitor start capacitor run 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 11-kV, 3- , star (Y)-connected synchronous motor takes 60 amp current. The effective resistance and synchronous reactance per phase are 1.2 and 30 respectively. Find—
 - (a) the power supplied to the motor;
 - (b) the induced e.m.f. for a p.f. of 0.8 leading.
12. Explain the construction of a synchronous motor with a neat sketch.
13. (a) Explain, with the help of power flow diagram, how electrical input is converted into mechanical power output in an induction motor.

(b) The rotor resistance and standstill reactance per phase at a 3-phase slip-ring induction motor are 0.02 and 0.1 respectively. What should be the value of the external resistance per phase to be inserted in the rotor circuit to give maximum torque at starting?

- 14.** ^{*} (a) Draw the equivalent circuit of three-phase induction motor in comparison with transformer.
- (b) Calculate the torque exerted by an 8-pole, 50 Hz, 3-phase induction motor operating with a 4% slip which develops a maximum torque of 150 kg-m at a speed of 660 r.p.m. The resistance per phase of the rotor is 0.5 .
- 15.** Describe the no-load test and blocked rotor test on an induction motor.
- 16.** A 3- induction motor having a star-connected rotor has an induced e.m.f. of 80 volts between slip rings at standstill on open circuit. The rotor has a resistance and reactance per phase of 1 and 4 respectively. Calculate current/phase and power factor when—
- (a) slip rings are short circuited;
- (b) slip rings are connected to a star-connected rheostat of 3 per phase.
- 17.** Explain the speed control methods of (a) split-phase motor, (b) permanent split-capacitor and (c) shaded pole motor.
- 18.** Explain the construction and working principle of a universal motor.
