

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Civil Engg.) (Sem.-6)

ELECTRIC MACHINES

Subject Code : OEE-201-18

M.Code : 79322

Date of Examination : 14-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Why the slots on rotor of an induction motor are usually skewed?
- b) Under normal operation of the induction motor, the rotor core loss is usually negligible. Explain.
- c) Why single-phase induction motor is not self-starting?
- d) What is the advantage of using a capacitor start motor over a resistance start split-phase motor?
- e) List the disadvantages of linear induction motor.
- f) Define stepping angle in stepper motor.
- g) What is the difference between synchronous reluctance motor and switched reluctance motor?
- h) State the applications of PCB motors.
- i) What are different types of permanent magnets?
- j) Draw the torque-speed characteristics of reluctance motor.

SECTION-B

2. The open circuit and short circuit tests are conducted on a 220 V, 50 Hz, 4 pole single induction motor. The test data are:

No load test: 220V, 1.5A, 60 W

Blocked rotor test: 200V, 5 A, 900W

The resistance of main primary winding is 12 Ω . Determine the equivalent circuit parameters of the induction motor.

3. Show that the maximum torque internal torque developed by a 3-phase induction motor is independent of rotor circuit resistance.
4. Give the classification of stepper motor. Explain the working principle of permanent magnet stepper motor with regard to a 4-pole stator and 6-pole permanent magnet stepper motor.
5. Explain the construction and working principle of PCB motor.
6. Describe the principle of operation of a linear induction motor and draw its characteristics.

SECTION-C

7. Justify that ideal single-phase induction motor does not produce rotating field. Further, develop the equivalent circuit of a single-phase induction motor with the help of double revolving field theory.
8. A 10 kW, 3-phase, 50 Hz, 4-pole induction motor has a full load speed of 1445 rpm. The mechanical and stray load losses at full load are 3.5% of output power. Compute :
- a) Power delivered from stator to rotor
 - b) Internal electromagnetic torque at full load
 - c) Rotor ohmic losses at full load.
9. Write note on the following :
- a) Plugging
 - b) Working principle of AC servo motor

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.