Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech. (Electronics Engineering/Electrical & Electronics)
(OE 2012 Onwards) (Sem.–6)

ELECTRICAL MACHINE

Subject Code : BTEEE-OPA
M.Code : 72838

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) Define magnetic field intensity, flux and flux density.

b) What are the core losses and how can this loss be minimized?

c) Define Faraday's Law of Electro Magnetic Induction.

d) What are the conditions for parallel operation of a transformer?

e) Draw the no load phasor diagram of a transformer.

f) Why the Starters necessary for starting DC motors?

g) What is the significance of back emf in a DC motor?

h) What are the various methods available for making single phase motor self-starting?

i) State the advantage of using capacitor start motor over a resistance split phase motor.

j) What are the advantages of cage type induction motor?

SECTION-B

2. Explain the working principle of synchronous machine with neat diagram.

3. Draw and explain fully the general block diagram representation of an electromechanical energy conversion device.

4. Explain polarity test of single phase transformer with suitable circuit diagram.

5. Explain the working principle of capacitor start single - phase induction motor. Why should be the auxiliary winding in a capacitor start motor be disconnected after the motor has picked up speed?

6. The peak value of flux density in the core of a 300/ 3000 V, 50 Hz 1 -phase transformer is 1.4 Wb / m^2. If the e.m.f. per turn is 10 volts, calculate:

   a) Primary and secondary turns and

   b) Area of cross section of the core.

SECTION-C

7. Explain the principle of operation of dc machine. Derive the expression for the back emf in a dc motor. Briefly explain the role it plays in starting and running of the motor.

8. A cage induction motor has a short-circuit current of 4 times the full-load value and has a full- load slip of 0.05. Determine a suitable auto-transformer ratio if the supply current is not exceed twice the full-load current. Also determine the starting torque in terms of the full-load torque.

9. An 8-pole, 400 V shunt motor has 960 wave connected armature conductors. The full load armature current is 40 A and flux per pole is 0.02 Wb. The armature resistance is 0.1 ohm and the contact drop is 1 V per brush. Calculate the full load speed of the 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.