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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electrical & Electronics Engg.) (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. What would happen if a transformer designed for 50 Hz is connected to a 100 Hz source of the same voltage?
- b. What is the difference between power transformer and distribution transformers?
- c. What is the value of slip at standstill position?
- d. How to make single-phase induction motor self starting?
- e. How can ohmic loss be measured in a transformer?
- f. How is the voltage regulation of a transformer affected by a change in its operating frequency?
- g. Why does a 3-phase induction motor always run at a speed less than the synchronous speed?
- h. "The rotating fields of the stator and rotor are stationary with respect to each other". Justify the statement.
- i. Why are interpoles designed to provide mmf more than the armature mmf in the commutating zone?
- j. Explain the function of commutator in a dc motor.

SECTION-B

2. A 6-pole, 3-phase induction motor develops maximum torque at 1000 rpm when operated from a 60 Hz supply. Rotor resistance per phase is 1.2 ohm. Neglect stator impedance. Find the speed at which it will develop maximum torque when operated from 50 Hz source.
3. Derive the equivalent circuit of a single-phase induction motor with the help of double revolving field theory.
4. Derive torque-current characteristics of dc shunt, series and cumulative compound motors. Sketch these characteristics in one figure on the assumption of
 - a. Same torque at no load
 - b. Rated torque at rated current.
5. Discuss the working of universal motor and draw its equivalent circuit.
6. What is meant by armature reaction of a synchronous machine?

SECTION-C

7. Explain what would happen if the dc motor is directly switched on to the supply without any starter. Explain the working of three point starter.
8. A 100 kVA, 1000/400 Volts, single-phase transformer, when excited at rated voltage on h.v. side, draws a no-load current of 3.0 A at 0.5 lagging power factor. If it is excited from the l.v. side at rated voltage, determine the no load current, power factor and power input.
9. Explain the function of two stator windings in a single-phase induction motor and develop the equivalent circuit of single-phase induction 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.