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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (Electrical Engineering) (Power System) (Sem.-2)

DYNAMICS OF ELECTRICAL MACHINES

Subject Code : EEPS-203C-18

M.Code : 76086

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1.
 - a) From the equivalent circuit of a three phase induction motor, derive an expression for the air gap power in terms of rotor resistance, slip etc.
 - b) What is meant by SCR? What is its effect on the performance of a synchronous machine?
2.
 - a) For both the motor and generator operation, show that an overexcited synchronous machine delivers reactive power to the supply system, an under excited synchronous machine absorbs reactive power from these supply.
 - b) From the torque matrix of three phases salient pole synchronous machine and its phasor diagram, obtain an expression for synchronous power in terms of load angle.
3.
 - a) Discuss the details of a steady state and transient analysis of a separately excited dc generator.
 - b) Discuss the effect of sudden short circuit on a separately excited dc generator. Obtain approximate solutions for the resultant armature current after the short circuit.
4. Deduce Park's transformations relating the 3-phase current of a synchronous machine to its corresponding d- q axes currents and its inverse.
5.
 - a) Derive the expression for armature mutual inductances of a salient pole synchronous machine from a consideration of its basic parameters.
 - b) Discuss the operational parameters of the synchronous machines.

6.
 - a) Discuss the excitation system of alternator.
 - b) Discuss the starting methods of synchronous motor.
7.
 - a) Derive the torque equation of DC motor. Also give the significance of back e.m.f.
 - b) Derive the voltage equation of primitive 4 winding commutator machine.
8.
 - a) Discuss small signal oscillation in state variable form for two machine system.
 - b) In modelling of induction motor write basic machine equation in d-q reference frame.

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.