Roll No ....

MEPS - 105

M.E./M.Tech., I Semester

Examination, June 2014

Adv. Course in Electrical Machines

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.

ii) All question carry equal marks.

1. a) For D.C. Machines, show that the motional inductance

M_d is given by $M_d = \dfrac{\varphi Z}{\pi a} \dfrac{1}{I_f}$ The symbols used have their

usual meaning.   7

b) The brush axis of a separately excited d.c. Motor armature is displaced from 9-axis by an angle $\alpha°$ show that its electromagnetic torque T_e is given. by

$$T_e = \left[M_d \, I_f \, I_a \cos\alpha + \frac{1}{2} I_a^2 (L_d - L_q) \sin 2\alpha \right]$$ 7

2. Give the steady state and transients analysis of D.C. machine and, obtain the expression of speed in terms of other parameters, draw its characteristics also.   14

3. Describe the steady state operation using Kron's primitive model and equivalent circuit of three phase induction motor. obtain the voltage and torque equations for the steady state operations.   14

4. a) Obtain the transformation equations for rotating three phase windings of synchronous machine .   7

b) Draw the phasor diagram for non salient pole alternator and write voltage and power equations using the phasor diagrams.   7

5. Describe the various reactances and time constants, and how deduce these parameters using the short circuit oscillograms (characteristics) with the help of graph papers (log/semi log etc).   14

6. Obtain the pork's transformation for the synchronous machines. What do you mean by porks inverse transformation. Then find the value of operational impedances.   14

7. a) Explain in brief the approximate method apply for the power system analysis.   7

b) What do you mean the analysis of line to line short circuit in the power system occurs.   7

8. Write a short notes on the following: 14

a) Steady state analysis of schrage motor

b) Cross field commutator machines

c) The problem of power system analysis.

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