

Roll No

MEPE - 204**M.E./M.Tech., II Semester**

Examination, June 2016

Modeling And Simulation of Drives*Time : Three Hours**Maximum Marks: 70*

- Note:** i) Attempt any *five* questions.
ii) All questions carry *equal* marks.

- Obtain the expressions for three-phase induction motor (voltage and current) in state variable form in
 - Stator reference frame
 - Synchronous reference frame and rotor reference frame model
- List and compare various closed loop control techniques of chopper fed DC drives.
 - Explain mathematical modeling of current loop of chopper fed DC drives.
- Explain the operation of three phase induction motor fed from non-sinusoidal voltage supply.
 - Describe the scalar control techniques for controlling the speed of induction motor drives.
- Explain multi quadrant operation of dc separately excited motor fed from fully controlled rectifier with necessary circuit and output wave diagrams.

- What are the electrical and mechanical features to be considered in the selection of motor for a particular service.
 - An electric motor has load variation as given below:
Torque 240Nm for 20 minutes
 140Nm for 10 minutes
 300Nm for 10 minutes
 200Nm for 20 minutes
If the speed of the motor is 720 rpm,
Find the power rating of motor.
- Derive an expression for the temperature rise of an electric motor. State the assumptions made.
 - Describe the methods for determination of rating of a motor for continuous duty and variable load.
- Explain the principle of vector control of induction motor.
 - Discuss about direct or feedback vector control of AC drives.
- In a separately excited dc motor with its field already connected, the armature is modernly connected to the rated supply. Explain with the help of necessary equations and MATLAB SIMULINK diagram as to how $i_a(t)$ can be obtained on a computer. Choose your own parameters.
 - Explain rotating field theory modeling of single phase induction motor and draw flow chart for simulation of I_a (is the armature current) and $\cos\phi$ (is the power factor)
