

Code No: A4304,C4204,C4304,C5404**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****M.Tech I Semester Examinations, March/April 2011****POWER ELECTRONIC CONTROL OF DC DRIVES****(COMMON TO POWER ELECTRONICS, POWER AND INDUSTRIAL
DRIVES, POWER ELECTRONICS, POWER ELECTRONICS AND ELECTRIC
DRIVES)****Time: 3 hours****Max. Marks: 60****Answer any five questions
All questions carry equal marks**

- - -

1. Draw and explain the power circuit of single phase semi converter feeding a separately excited dc motor. Explain the operation in both continuous and discontinuous armature current modes with suitable wave forms. [12]
2. Explain the operation of a three phase full converter drive. Also, sketch and explain the output voltage and output current waveforms at firing angle of 60° , 90° and 120° . [12]
3. a) Explain the closed loop operation of two quadrant converter controlled separately excited dc motor using a suitable block diagram.
b) A freewheeling diode reduced the harmonics in the output current. This is true for triggering angles above a certain values. What is that limiting triggering angle? [6+6]
4. Explain the operation of the closed loop speed controlled separately excited dc motor chopper drive. [12]
5. a) Draw the flow chart for the dynamic simulation of chopper controlled dc motor drive.
b) Discuss command current generator and current controller. [6+6]
6. Discuss the control circuit design for a two quadrant chopper circuit. [12]
7. Discuss in detail the harmonic and its associated problems in phase controlled dc motor driver. [12]
8. Write short notes on the following
a) Addition of freewheeling diode in controlled bridge rectifier.
b) Principle of operation of four quadrant chopper.
c) The factor which limit the high frequency operation of chopper. [12]
