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Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, November 2015
(2008 Scheme)**

08.804 : POWER SEMI CONDUCTOR DRIVES (E)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer *all* questions from Part – A and *one full* question from *each* Module of Part – B.

PART – A



1. Differentiate between active torque and passive torque.
2. Derive the fundamental equations of motor load system.
3. Explain the steady state stability of a motor load system.
4. Describe the frequency and voltage control of cycloconverter.
5. Explain a two quadrant chopper with diagrams.
6. Explain the operation of a 1-phase half controlled converter fed d.c. motor drive.
7. Explain the different types of electric braking in motors.
8. Discuss the effect of harmonics in the torque produced in a 3 phase induction motor.
9. Explain the operation of stator frequency control.
10. Draw and explain about the speed torque curves of an induction motor with v/f control.

(10x4= 40 Marks)

P.T.O.



PART – B

Module – I

11. a) Explain the four quadrant operation of motor driving a hoist load and draw torque speed characteristics. 12
- b) Derive the expressions for equivalent values of drive parameters for loads with rotational and translational motion. 8

OR

12. a) Draw the block diagram of an electric drive system. Explain the functions of each block. 10
- b) Explain the operation of a 3-phase to single phase step down cycloconverter with circuit diagram and wave forms. 10

Module – II

13. a) Explain how the speed of a separately excited dc motor can be controlled in all the four quadrants using a dual converter, when the dual converter is operating in circulating current mode. 10
- b) A 230V, 1000 rpm, 30 A separately excited motor has armature resistance and inductance of 0.7Ω and 50 mH respectively. Motor is controlled in regenerative braking by a chopper operating at 800 Hz from a dc source of 230V. Assuming continuous conduction
- i) Calculate duty ratio of chopper for rated torque and the speed of 800 rpm.
- ii) What will be the motor speed for duty ratio of 0.6 and rated motor torque? 10

OR

14. a) Describe the two quadrant operation of a dc motor using single phase dc converter drive. 10
- b) Explain regenerative braking of a chopper fed separately excited dc motor. 10



Module – III

15. a) Explain with circuit diagram and wave form the rotor chopper speed control of slip ring induction motor. 10
- b) Explain the stator voltage control method for the speed control of an induction motor. Why it is suitable for fan and pump drives ? 10

OR

16. a) What is meant by slip power recovery scheme ? Explain what are its advantages. 10
- b) Explain the working of a current source inverter fed induction motor drive. 10

