PSNA COLLEGE OF ENGINEERING AND TECHNOLOGY
Department of Electrical and Electronics Engineering
Serial Test-1
EE1351-SOLID STATE DRIVES

Year/Sem : III/VI **Max Marks: 50**
Date : 02-02-09 **Duration: 90mins**
Faculty : M.Kaliamoorthy
M.Sekar

PART-A

Answer any **NINE** questions **9 x 2 =18**

1. What are the elements of Electrical drive systems?
2. What do you mean by equilibrium operating point?
3. What are the advantages of solid state drives?
4. What do you mean by steady state stability?
5. Mention the types of electric braking employed for electric drives.
6. What are the three components of load torque?
7. What are the different modes of operation of an electric drives?
8. What are all the conditions to be satisfied for the regenerative braking operation to take place in a DC motor?
9. What are the uses of phase controlled rectifiers in DC drives?
10. Write the expression for the average output voltage of a single phase full converter fed dc drive?

PART-B

Answer **ALL** questions **2 x 16 = 32**

11. (a) (i) Give in brief the characteristics of different types of loads. **(6)**
(ii) Explain in detail constant HP and Constant torque operations **(4)**
(iii) Explain the regenerative braking in separately excited DC motor **(6)**

Or

(b) (i) Derive the equations governing motor load dynamics from the basic principles **(8)**
(ii) Discuss in detail about steady state stability considerations in an electrical drive **(8)**

12. (a) A motor having a suitable control circuit develops a torque given by the relation $T_m = p\omega + q$ where p and q are positive constants. The motor is used to drive a load whose torque is expressed as $T_L = r\omega^2 + s$ where r and s are two positive constants. The total inertia of the rotating masses is J
    a) Determine the relation among p, q, r and s in order that the motor can start together with the load and have an equilibrium operating speed. **(8)**
    b) Calibrate the equilibrium operating speed. **(8)**

Or

(b) Explain the operation of a single phase fully controlled converter fed separately excited DC motor with neat waveforms and derive the speed torque characteristics. **(16)**

Faculty in charge **HOD/EEE**