Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 41007

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Sixth Semester
Electrical and Electronics Engineering
EE6601 – SOLID STATE DRIVES
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What are the types of load torques ?
2. What is meant by regenerative braking ?
3. List out the drawbacks of AC-DC converter fed DC drive.
4. What are the advantages of chopper fed DC drives ?
5. What are the various applications of stator voltage control scheme ?
6. What are the three regions in the speed-torque characteristics of the induction motor ?
7. What are the different types of controls used in synchronous motor drives ?
8. What are the advantages of permanent magnet synchronous motors ?
9. What are the advantages of closed loop speed control schemes ?
10. List out the simulation software packages that can be used for electrical drives.

PART – B (5×13=65 Marks)

11. a) i) Write equations governing motor load dynamics. (6)

ii) Explain in detail with an example multi-quadrant dynamics in the Speed-Torque plane. (7)

(OR)

b) i) What are the factors governing the selection of electric drives for any particular application ? (6)

ii) State and explain the functions of essential parts of an electrical drive. (7)

12. a) Explain in detail, the operation of a single phase fully controlled converter fed separately excited DC motor in continuous and discontinuous modes with steady state analysis and waveforms. (13)

(OR)

b) i) Explain the operation of four quadrant chopper fed DC separately excited motor drive with necessary diagrams. (7)

ii) What are the types of control strategies in a dc chopper ? (6)

13. a) i) What are the drawbacks of stator voltage control method ? (5)

ii) Explain the speed control scheme of induction motor drive with v/f control technique. (8)

(OR)

b) Describe the closed loop speed control of VSI fed and CSI fed induction motor drives. (13)

14. a) i) Discuss using a block diagram the operation of a voltage source inverter fed synchronous motor in the true synchronous mode. (7)

ii) Explain the self control of synchronous motor in detail. (6)

(OR)

b) Explain in detail the construction, principle of operation and applications of permanent magnet synchronous motor. (13)

15. a) Explain the design procedure and derive the transfer function of the speed and current controller. (13)

(OR)

b) Derive the transfer function of DC motor-load system with converter fed system. (13)

PART – C (1×15=15 Marks)

16. a) Compare in detail V/f control strategies of induction motor and synchronous motor drives. (15)

(OR)

b) Design a current controller for a small capacity constant speed drive.