

L1B
21/12/13 FN

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 33434

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Sixth Semester

Electrical and Electronics Engineering

EE 1351 — SOLID STATE DRIVES

(Regulation 2004/2007)

(Common to B.E. (Part-Time), Fifth Semester, Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define dynamic torque.
2. Draw the load torque characteristics of low speed hoist.
3. What is the necessity of controlled converter for a dc drive?
4. Write any two advantages of chopper fed dc drives.
5. What are the drawbacks of variable stator voltage control?
6. Define slip power.
7. Write any two advantages of self-control technique.
8. What do you mean by brushless excitation?
9. Write the transfer function of converter.
10. Write down the equations for real and reactive power.

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about equilibrium point and its steady state stability and hence derive the mathematical condition for steady state stability? (16)

Or

- (b) (i) Explain the multi quadrant operation of low speed hoist. (8)
(ii) Derive the expressions to find the equivalent values of drive parameters of loads with translational motion? (8)
12. (a) Explain the continuous and discontinuous conduction modes of operation of three phase fully controlled converter fed dc drive with circuit diagram, waveforms and equations. (16)

Or

- (b) (i) Explain the control strategies of chopper in detail. (8)
(ii) Explain the operation of type - E chopper in detail. (8)
13. (a) (i) Explain the variable stator voltage control method of induction motor. (8)
(ii) Explain the working of static scherbius drive in detail. (8)

Or

- (b) (i) Explain the theory of v/f control in detail. (10)
(ii) Make a comparison between VSI and CSI fed drives. (6)
14. (a) Explain the concept of self-control technique of synchronous motor in detail with the operation of rotor position encoder. (16)

Or

- (b) (i) Explain the power factor control of synchronous motor drive. (8)
(ii) Write short notes on permanent magnet synchronous motor. (8)
15. (a) Explain the operation of armature voltage control with field weakening mode control in detail with neat sketches. (16)

Or

- (b) Explain the design procedure and operation of current controller in detail. (16)