

L1B
16/12/13 FN

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Question Paper Code : 82108

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Second Semester

Power Electronics and Drives

PE 9221/PE 921/10233 PE 201 — SOLID STATE DC DRIVES

(Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the requirements of drive characteristics?
2. What is meant by mechanical characteristics?
3. What are the harmful effects of current ripples?
4. What are the advantages of a freewheeling diode?
5. State the functions of four quadrant operation.
6. State the advantages of dc chopper drives.
7. What are the advantages of closed loop c of dc drives?
8. What are the types of control strategies in dc chopper?
9. What are the methods used for firing the gates?
10. What is the purpose of a phase locked loop control in a dc drives?

PART B — (5 × 16 = 80 marks)

11. (a) Discuss briefly the factors involved in the selection of motor rating and requirement of drive characteristics.

Or

- (b) Write briefly about Ward Leonard method of speed control and state its advantages.

12. (a) Explain about three phase converter fed dc motor with relevant waveform and performance characteristics.

Or

- (b) With relevant expression describe about the continuous and discontinuous current conduction operations.
13. (a) (i) Explain about class A chopper controlled dc motor. (8)
(ii) Describe about the various methods of chopper based braking schemes. (8)

Or

- (b) With a neat diagram explain the multi-quadrant operation of a dc motor.
14. (a) Design a linear transfer function model of a power converter.

Or

- (b) Design a closed loop speed control system with relevant controller and feedback elements.
15. (a) Design a digital drive for a dc motor which uses PLL and microcomputer control.

Or

- (b) Explain about various speed detection methods and a gate firing techniques with necessary schematic representations.
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