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

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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