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Question Paper Code : 71778

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Fifth Semester

Electrical and Electronics Engineering

EE 6503 — POWER ELECTRONICS

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering, Mechatronics Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by commutation of SCR and list its types?
2. What are the advantages of GTO over SCR?
3. What is meant by Phase Control?
4. What are the roles of freewheeling diode in a controlled rectifier?
5. Write the applications of DC Chopper.
6. What is meant by resonant converter?
7. Why thyristors are not preferred for Inverter?
8. What are the disadvantages of the harmonics present in the inverter system?
9. What is a matrix converter?
10. Compare integral cycle control and phase control in AC voltage controllers.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the construction and switching characteristics of SCR. (16)

Or

- (b) Describe about any one Driver and Snubber circuit for MOSFET. (16)

12. (a) Explain the operation of dual converter with complete diagram and waveforms. (16)

Or

- (b) Discuss the operation of single phase fully controlled rectifier supplying RL load with neat Waveforms. Also derive the expression for the average output voltage? (16)
13. (a) (i) Explain the control strategies of chopper. (8)
- (ii) A step down DC chopper has input voltage of a 230 V with 10 ohms load resistor Connected, voltage drop across chopper is 2 V what it is ON. For a duty cycle of 0.5, Calculate
- (1) Average and RMS value of output voltage
- (2) Power delivered to load. (8)

Or

- (b) Explain the working of Boost converter in detail with necessary waveforms and Equation. (16)
14. (a) Explain the operation of 3 phase bridge inverter for 120 degree mode of operation with aid of Relevant phase and line voltage waveforms. (16)

Or

- (b) State different methods of voltage control inverters. Describe about PWM control in inverter. (16)
15. (a) Explain the operation of two stage sequence control of AC Voltage Controller. (16)

Or

- (b) Discuss the operation of three phase to single phase cyclo-convener with neat circuit diagrams and Waveforms. (16)