

-
- h. The choppers are commonly used as:
- (A) DC transformers (B) Voltage regulators
(C) Harmonics generators (D) Frequency controllers.
- i. The commonly used device for protection against transient over voltages is:
- (A) Schottky diode (B) Selenium diode
(C) Bipolar junction transistor (D) Heat sink.
- j. For series and parallel operation of thyristors, the preferred approach is to:
- (A) Use a common heat sink
(B) Connect a small resistance in series with each thyristor
(C) Use magnetically coupled inductors
(D) Provide voltage and current sharing networks to protect them under steady-state and transient conditions.
-

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

- Q.2** a. With the help of circuit diagrams explain gate turn-off and gate turn-on of a thyristor. **(4+4)**
- b. Discuss the methods of thyristor protection. **(8)**
- Q.3** a. What is the role of UJT and MOSFETs in triggering mechanism of power controlled circuits? **(8)**
- b. Explain the commonly used cooling arrangements for high power devices. What are the merits and demerits of water and air cooled systems? **(8)**
- Q.4** Write notes on the following:
- (i) Light Activated SCR,
(ii) Thyristor Commutation.
- Give diagrams, schematics and operational characteristics. **(8+8)**
- Q.5** a. Compare the working of full wave controlled centre tap rectifier with full wave controlled bridge rectifier with the help of circuit explanation. **(8)**
- b. Why is the power factor of semi-converters better than that of full-converters? **(8)**
- Q.6** a. With the help of diagram, explain the working principle of Full-wave Half controlled Bridge Rectifiers with FWD. **(8)**
- b. Using block/schematic diagram explain working of a half-wave three pulse controlled rectifier. **(8)**

-
- Q.7** With the help of diagram / circuit explain the working of following:-
- (i) Buck-Boost chopper.
 - (ii) Step down chopper. **(8+8)**
- Q.8** a. What is the principle of operation of an inverter? Give its performance parameters? **(6+4)**
- b. What are the advantages and disadvantages of current-source inverters? **(6)**
- Q.9** 'Static and mechanical switches, Cycloconverters and Controlled rectifiers are used in Power Electronics' --- justify this statement by giving examples, their operating characteristics and their typical utility in industrial applications. **(6+10)**