

2062  
B.E. (Electronics and Communication Engineering)  
Sixth Semester  
EC-625: Power Electronics

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

1.	Answer in brief and to the point. a) Why power devices are prone to thermal runaway? How it can be avoided? b) Discuss the effect of source impedance on the output of a semi-converter with RL load. c) How the harmonics are controlled at the output of an inverter? Explain. d) Why chopper is preferred over rheostat to control power in power circuits? e) List the typical disturbances on Power Line and define them.	2x5
<b>Section-A</b>		
2.	a) What is MOS controlled thyristor (MCT)? Differentiate it from power MOSFET on the basis of working principle. b) Describe the working of a semi-converter with 'R' load. Discuss the changes in its voltage and current waveforms when nature of load is changed to 'RL'.	5 5
3.	a) What is meant by 'fast recovery' in power devices? Discuss how it can affect the performance of a power device. b) For a half-wave controlled converter, working at 230V, 50Hz 1-phase supply, the firing and extinction angles are 35 degree and 215 degree respectively. Find average load voltage and current for load consisting of $R = 5$ ohms, $L = 1$ mH, and $E = 100$ V.	5 5
4.	a) A DC motor is required to change its direction of rotation whenever the polarity of voltage is reversed. Suggest which chopper is best suitable to control this motor? Explain the working principle of the same. b) Write a technical note on 'Protection of power devices'.	5 5
<b>Section-B</b>		
5.	a) With the help of circuit diagram, explain the working of a 1-phase full-bridge inverter and discuss the role of diodes in this circuit. b) Discuss the Principle of operation of 1-phase current source inverter.	5 5
6.	Write technical notes on the followings: a) Load resonant converter b) UPS	5x2
7.	a) What types of disturbances are there on power lines? Discuss the source of each type and ways to prevent them. b) List salient features of series loaded half bridge DC-DC converter and explain its one application.	5 5

x-x-x