

2053

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.	<p>a. What is the difference between a linear power supply and a switched-mode power supply (SMPS)?</p> <p>b. What is a power MOSFET, and what are its advantages and disadvantages compared to other types of power transistors?</p> <p>c. What are the disadvantages of poor power factor?</p> <p>d. Define THD? How it can be minimized?</p> <p>e. What is electromagnetic interference (EMI), and how can it be mitigated in power electronics?</p>	(2×5)
<b>Section A</b>		
2.	<p>a. Compare Power diode, Schottky diode and, switching diode</p> <p>b. Explain two transistor analogy of SCR the I-V characteristics of SCR. What is the concept of gate triggering in SCR? Why SCR protection circuit is required?</p>	3 7
3.	Compare the current and voltage waveform of Half wave uncontrolled rectifier with R and R-L load. What is the use of freewheeling diode? Describe rectifier performance parameters.	10
4.	A DC-DC converter is supplied with power from an ideal battery of 120 V is used to obtain lower voltage as compared to input. The load voltage waveform consists of rectangular pulses of duration 5ms in an overall cycle time of 12ms. For resistive load of 10 Ω and draw the circuit and calculate (a) the duty cycle. (b) the average value of the output voltage. (c) the rms value of the output voltage. (d) the output dc power.	10
<b>Section B</b>		
5.	Explain the operating principle of a resonant converter and compare it with a conventional converter. Also, discuss the advantages and disadvantages of using resonant converter	10
6.	What are the different types of power conditioners, and how do they improve the quality of power in power electronics?	10
7.	Discuss the differences between a quasi-square wave inverter and a full bridge square wave inverter. How does PWM inverter differ from a square wave or quasi-square wave inverter? What are the advantages and disadvantages of PWM inverters?	10

x-x-x