

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3151106****Date:27/01/2021****Subject Name:Power Electronics****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	Marks
Q.1 (a) What is SCR commutation? Explain the self commutation in brief.	03
(b) Make the comparison between Power MOSFET and IGBT.	04
(c) A 100 A SCR is to be used in parallel with 50 A SCR. The on state voltage drops of the SCRs are 2 and 1.5 V, respectively. Calculate the series resistance that should be connected with each SCR if two SCRs have to share the total current 150 A in proportion to their rating	07
Q.2 (a) Explain the di/dt and dv/dt rating of SCR.	03
(b) Explain the resistance triggering circuit for SCR.	04
(c) Explain the operation of single phase fully controlled bridge converter with resistive and inductive load. Draw the associated waveforms.	07
Q.3 (a) What is the function of Chopper? Explain the working of type D chopper.	03
(b) With help of waveform explain the Time Ratio Control strategy of chopper.	04
(c) With help of neat circuit diagram and waveforms, explain the operation of PWM inverter with resistive load.	07
Q.4 (a) What are the applications of chopper? Explain the working of class E chopper.	03
(b) Compare the step up and step down chopper.	04
(c) With help of neat circuit diagram and waveforms, explain the operation of full bridge square wave inverter.	07
Q.5 (a) List the types of commutation and explain class c forced commutation.	03
(b) Compare SCR and TRIAC.	04
(c) What are the on conditions for SCR? Explain the RC triggering circuit in detail.	07
Q.6 (a) Design and explain the operation of current source inverter.	03
(b) Design and explain working of snubber circuit of SCR.	04
(c) Draw and explain the structure of power MOSFET. Also explain principle of operation and V-I characteristics of power MOSFET.	07
Q.7 (a) Compare Power supply and SMPS.	03
(b) Explain the working of forward converter SMPS.	04
(c) Write short note on On-line UPS.	07
Q.8 (a) Compare EMI and EMC.	03
(b) Explain the working of separately excited DC motor drive.	04
(c) Write short note on series loaded half bridge DC-DC converter.	07
