Seat No.: Enrolment No	
------------------------	--

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII EXAMINATION – WINTER 2015

Subject Code: 171002 Date: 07/12/20			
Subj	ect N	Jame: Power Electronics	
		30am to 1:00pm Total Marks: 70	
Instru			
		Attempt all questions. Make suitable assumptions wherever necessary.	
		Figures to the right indicate full marks.	
Q.1	(a)	Answer the following in brief	08
	(3)	What are the requirements to make the SCD on 2 Explain the verious Turn	
	(i)	What are the requirements to make the SCR on? Explain the various Turn On methods in brief.	
	(ii)		
	(b)	Answer the following	06
	()		
	(i)		
		voltage drops of the SCRs are 2 and 1.8 V, respectively. Calculate the	
		series resistance that should be connected with each SCR if two SCRs have to share the total current 250 A in proportion to their rating.	
	(ii	1 1	
	(11)	DAPIANI die Shabber enedits for Bert.	
Q.2	(a)	Explain the operation of single phase semi controlled bridge converter	07
		with resistive and inductive load. Draw the associated waveforms.	
	(b)	Calculate the average output voltage of a three phase half controlled	07
		bridge operating with triggering angle $\pi/2$ and connected to three phase ac supply of 400V and 50 Hz. The load current is assumed to be continuous.	
		OR	
	(b)	A single phase half wave converter is used to supply power to a load of	07
		impedance 10 Ω from 230 V, 50 Hz ac supply at the firing angle of 30°.	
		Calculate average load voltage, load current and RMS load voltage.	
Q.3	(a)	With help of neat circuit diagram and waveforms, explain the operation of	07
Ų.S	(a)	three phase bridge inverter with resistive load in 120° conduction mode.	U/
	(b)	With help of neat circuit diagram and waveforms describe the working of	07
		a two quadrant chopper. List out its applications.	
		OR	
Q.3	(a)	Explain the single phase PWM, transformer connection, multiple	07
		commutation and filter methods used for reduction of harmonics in inverter output.	
	(b)	Compare the step up and step down chopper.	07
	(-)	r	٠.
Q.4	(a)	What is commutation? With help of circuit diagram and necessary	07
	<i>(</i> 3. \	waveform explain the complementary (Class C) forced commutation.	^-
	(b)	Explain the construction and characteristics of UJT and working of UJT	07
		as an oscillator for generation of triggering pulses.	

Q.4	(a)	With help of circuit diagram explain the half wave and full wave RC	07
		firing circuits of SCR.	
	(b)	Draw and explain the structure of power MOSFET. Also explain principle	07
		of operation and I-V characteristics of power MOSFET.	
Q.5	(a)	Write short note on isolation circuits and pulse transformer.	07
	(b)	Write short note on On-line UPS.	07
	, ,	OR	
Q.5	(a)	Write short note on Boost converter.	07
	(b)	Write short notes on RF heating.	07
