

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2150903

Date: 19/06/2019

Subject Name: Power Electronics – I

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Explain DIAC with construction and characteristics.	03
	(b) Explain IGBT with construction and characteristics.	04
	(c) Enlist various commutation circuit of SCR. Explain any one voltage commutation circuit.	07
Q.2	(a) What is snubber circuit? Explain working and application for same.	03
	(b) Explain UJT relaxation oscillator.	04
	(c) Explain working of series connected SCRs.	07
	OR	
	(c) Explain working of parallel connected SCRs.	07
Q.3	(a) Explain duty cycle and chopper frequency.	03
	(b) Explain harmonics in power electronic circuit and enlist harmonic sources.	04
	(c) Explain cuk converter in detail.	07
	OR	
Q.3	(a) What is pulse transformer and opto-coupler?	03
	(b) Explain significance of freewheeling diode in controlled rectifiers.	04
	(c) Draw necessary waveforms and explain working of single phase full controlled rectifier circuit with R-L load.	07
Q.4	(a) What do you mean by continuous conduction mode and discontinuous conduction mode of operation in choppers.	03
	(b) Explain jone's chopper in short.	04
	(c) Write brief note on buck-boost converter.	07
	OR	
Q.4	(a) Give difference between voltage and current commutated choppers.	03
	(b) Draw and explain RC triggering circuit for SCR.	04
	(c) Explain 3 phase full wave rectifier with R load.	07
Q.5	(a) Explain basic principles for speed control of DC motor.	03
	(b) Explain the principle of motoring control of separately excited DC motor with phase controlled converter.	04
	(c) Explain single phase full converter drive feeding separately excited dc motor for continuous conduction mode.	07
	OR	
Q.5	(a) What is regenerative braking? Explain w.r.t. DC motor speed control.	03
	(b) Write short note on single phase dual converter.	04
	(c) Explain operation of four quadrant DC motor using chopper circuit.	07
