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 continues conduction mode and discontinues 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 exited DC motor with phase controlled converter.	**04**
	(c)	Explain single phase full converter drive feeding separately exited 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**

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