Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2150903 **Date:13/05/2016**

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.**

Q.1	**(a)**	Explain construction and working of GTO with its turnoff mechanism.	**07**
	(b)	Give comparison between power MOSFET and IGBT with respect to their operating frequency range, on state voltage drop range, type of snubber circuit requirement, maximum VI ratings, static VI characteristics, applications and circuit symbol.	**07**
Q.2	**(a)**	Enlist various commutation circuit of SCR. Explain any one voltage commutation circuit.	**07**
	(b)	Explain synchronized UJT circuit for triggering SCR.	**07**
		OR	
	(b)	Explain thermal equivalent circuit of power device. Mention what will be the effect of temperature rise on power dissipation capacity of device.	**07**
Q.3	**(a)**	Draw necessary waveforms and explain working of 1-ϕ full controlled rectifier circuit with R-L load.	**07**
	(b)	Explain working of four quadrant operation of dual converter.	**07**
		OR	
Q.3	**(a)**	Explain working of 1-ϕ semi converter with resistive load.	**07**
	(b)	Explain working of 3-ϕ half wave controlled rectifier with RL load with continuous conduction mode.	**07**
Q.4	**(a)**	Explain working of Jone's chopper circuit.	**07**
	(b)	Explain working of buck switching regulator circuit.	**07**
		OR	
Q.4	**(a)**	Explain working of switching boost regulator circuit.	**07**
	(b)	Explain working of Morgen's chopper circuit.	**07**
Q.5	**(a)**	Give block diagram for closed loop speed control of DC drive. Explain working of each block.	**07**
	(b)	Explain working of 1-ϕ full converter drive in continuous conduction mode.	**07**
		OR	
Q.5	**(a)**	Explain operation of four quadrant DC motor using chopper circuit.	**07**
	(b)	Explain working of SCR using two transistor analogy.	**07**

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