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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V- EXAMINATION – SUMMER 2016

Subject Code: 150903 **Date: 09/05/2016**

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 GTO turn on and turn off characteristics.	**07**
	(b)	Explain working of Cuk converter with schematic diagram and waveforms.	**07**
Q.2	**(a)**	Discuss two transistor analogy of SCR.	**07**
	(b)	Discuss static characteristics of IGBT. Compare IGBT with MOSFET.	**07**
		OR	
	(b)	Mention requirements of Gate circuit. Discuss use of DIAC in firing circuit.	**07**
Q.3	**(a)**	Discuss thermal model of thyristor. Write steps to design a snubber circuit.	**07**
	(b)	Discuss effect of source and load inductances on the performance of AC to DC controlled converter.	**07**
		OR	
Q.3	**(a)**	Why thyristors are connected in series? Discuss series operation of thyristor.	**07**
	(b)	Discuss power factor improvement techniques used in AC to DC controlled converter.	**07**
Q.4	**(a)**	Discuss four quadrant operations of DC drives.	**07**
	(b)	Explain working of buck-boost converter with schematic diagram and waveforms.	**07**
		OR	
Q.4	**(a)**	Explain working of Jone's chopper with schematic diagram and waveforms.	**07**
	(b)	Explain dual converter based DC drives.	**07**
Q.5	**(a)**	Discuss static analysis of time ratio control and current limit control.	**07**
	(b)	Explain principle of speed control of DC motor.	**07**
		OR	
Q.5	**(a)**	Explain microcomputer control of DC drive.	**07**
	(b)	Explain operation of three phase semi converter with RLE load.	**07**

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