Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: 142402 Date: 30-12-2013

Subject Name: Fundamentals of Power Electronics

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)**	Draw and explain block diagram of Power Electronics System.	**05**
	(b)	Fill in Blanks. (1) _____ works as a relaxation oscillator. (2) Diode that can works on a.c. is called _____ (3) _____ Operate at very low voltage.	**03**
	(c)	Define Commutation Explain Class-A Commutation with necessary waveforms.	**06**
Q.2	**(a)**	Write a detailed note on Turn- on Methods of SCR.	**07**
	(b)	Define DIAC. Draw and explain schematic construction, symbol and V-I characteristic of DIAC.	**07**
		OR	
	(b)	Draw structure, symbol and Equivalent circuit of UJT. Also derive equation for periodic time T of UJT relaxation oscillator.	**07**
Q.3	**(a)**	Explain 1-phase Cycloconvertor in detail.	**07**
	(b)	Draw and explain single phase MC-MURRAY Inverter circuit with suitable waveforms.	**07**
		OR	
Q.3	**(a)**	Write a detailed note on AC Chopper.	**07**
	(b)	Classify Inverter. Explain basic series Inverter with voltage and current waveforms.	**07**
Q.4	**(a)**	Draw and explain STEP-UP Chopper with necessary equation.	**07**
	(b)	Define TRIAC. Enlist all triggering modes of TRIAC and explain the most sensitive mode.	**07**
		OR	
Q.4	**(a)**	Enlist and explain control strategies employed in d.c. choppers.	**07**
	(b)	Draw and explain schematic construction, symbol and V-I characteristic of LASCR.	**07**
Q.5	**(a)**	Explain dv/dt and di/dt protection of SCR.	**07**
	(b)	Compare half controlled and full-controlled rectifiers.	**07**
		OR	
Q.5	**(a)**	Make a comparison chart of power semiconductor devices.	**07**
	(b)	Explain with the help of neat power diagram and associated waveforms, the operation of 1-phase half-wave controlled converter with Resistive and Inductive load.	**07**

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