Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 162405 **Date: 04-12-2013**

Subject Name: Power Processing circuit -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.**
4. **Notations/ symbols used have usual meanings.**

Q.1	**(a)**	Give detailed classification of rectifiers. Explain the concept of phase-angle control.	**07**
	(b)	Explain full-bridge converter with necessary circuit diagram and waveforms.	**07**
Q.2	**(a)**	Discuss any one three terminal IC based linear regulator.	**07**
	(b)	Describe the modeling of a controlled rectifier.	**07**
		OR	
	(b)	A half wave rectifier circuit using an SCR is adjusted to have a gate current of 2mA. The forward breakdown voltage of SCR is 150V for Ig = 2mA. When a sinusoidal voltage of 300V peak is applied; determine (i) conduction angle (ii) output power for a load resistance of 150Ω . Also, draw the rectifier circuit.	**07**
Q.3	**(a)**	Describe voltage mode control of power supply. State its merits.	**07**
	(b)	Describe the working principle Class- A type DC chopper.	**07**
		OR	
Q.3	**(a)**	Discuss the utility of input and output filter for a linear regulated power supply.	**07**
	(b)	Explain Morgan's chopper with necessary circuit diagram and waveforms.	**07**
Q.4	**(a)**	Discuss working of a boost converter. State its applications.	**07**
	(b)	Write short note on: - Fly back converter.	**07**
		OR	
Q.4	**(a)**	Describe operation of a Sepic converter. State its advantages.	**07**
	(b)	Write short note on: - Push- pull converter.	**07**
Q.5	**(a)**	Explain the basic concept of resonant switch converter circuit.	**04**
	(b)	Explain 3-Ø, phase controlled rectifier with inductive load using necessary waveforms for $\alpha = 45°$.	**10**
		OR	
Q.5	**(a)**	Compare: ZVS and ZCS.	**04**
	(b)	Explain voltage commutated chopper with neat circuit diagram and waveforms.	**10**

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