Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: X40902 **Date: 29-12-2014**

Subject Name: Power Electronics – I

Time: 02:30 pm - 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 difference between line commutation and forced commutation. Discuss complementary commutation technique in detailed.	**07**
	(b)	Discuss pulse transformer and its usage in triggering circuit.	**07**
Q.2	**(a)**	Discuss circulating current and non circulating current mode of single phase dual converter.	**07**
	(b)	Mention different types of protection required for thyristor. Discuss electronic crowbar protection.	**07**
		OR	
	(b)	Discuss unequal voltage distribution for two series connected SCRs during turn on and turn off.	**07**
Q.3	**(a)**	Explain operation of single phase semi converter with freewheeling diode.	**07**
	(b)	Explain difference between SCR and IGBT. Discuss Construction of IGBT.	**07**
		OR	
Q.3	**(a)**	What do you mean by unidirectional and bidirectional power devices? Explain Triac in detailed.	**07**
	(b)	Explain operation of single phase full converter with R-L-E load.	**07**
Q.4	**(a)**	Explain phase locked loop control of DC drive.	**07**
	(b)	Explain operation of cuk converter.	**07**
		OR	
Q.4	**(a)**	Explain snubber circuit with schematic diagram. Why is it required?	**07**
	(b)	Define duty cycle. Explain operation of step up chopper.	**07**
Q.5	**(a)**	Explain four quadrant operation of DC drive.	**07**
	(b)	Explain micro computer based dc drive.	**07**
		OR	
Q.5	**(a)**	Explain time ratio control and current limit control.	**07**
	(b)	Compare rehostatic and regenerative break control.	**07**

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