Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: 142402 **Date: 02-01-2015**

Subject Name: Fundamentals of Power Electronics

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)**	Define Power Electronics. Draw detailed static Anode-Cathode characteristic of a thyristor and Explain it.	**07**
	(b)	Draw & Explain the schematic diagram, symbol and V-I characteristic of LASCR.	**07**
Q.2	**(a)**	Write a detail note on:- TURN ON methods of SCR.	**07**
	(b)	Describe the construction and working of SCR using two transistors Analogy.	**07**
		OR	
	(b)	Explain UJT characteristics. How UJT works as relaxation oscillator?	**07**
Q.3	**(a)**	Define DIAC. Draw & Explain schematic diagram, symbol and V-I characteristic of DIAC.	**07**
	(b)	Draw & Explain equivalent circuit and transient response of Fast Recovery diode.	**07**
		OR	
Q.3	**(a)**	Enlist all triggering modes of TRIAC. Explain most sensitive mode.	**07**
	(b)	Draw Schematic diagram and symbol of IGBT. Explain in detail the operation of IGBT.	**07**
Q.4	**(a)**	Explain dv/dt and di/dt protection of SCR.	**07**
	(b)	What do you mean by cycloconverter? Explain 1-phase cycloconverter in detail.	**07**
		OR	
Q.4	**(a)**	Compare 1-phase & 3-phase uncontrolled rectifier.	**07**
	(b)	Write a detailed note on: - Power switch classification.	**07**
Q.5	**(a)**	Define Chopper. Enlist and Explain the control strategies employed in DC chopper for operating the switches.	**07**
	(b)	Define & Classify Invertes. Draw & Explain the schematic diagram of basic series inverter.	**07**
		OR	
Q.5	**(a)**	Explain Principles of operation of STEP-UP/DOWN Chopper and derive equation for output voltage.	**07**
	(b)	Draw & Explain single phase MC-MURRAY Inverter circuit with voltage and current waveforms.	**07**

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