Seat No.:	Enrolment No
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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII • EXAMINATION – WINTER 2013

	•	Code: 170801 Date: 26/11/2013	3
Tin	•	Name: Power Electronics and Industrial Drives 0:30 TO 01:00 Total Marks: 70 ns:	0
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	Describe the operation of 1-phase full wave rectifier with R-L load. Explain Two-Transistor Analogy of SCR in detail.	07 07
Q.2	(a)	Draw and explain the structure of IGBT. Also explain principle of operation and I-V Characteristics of IGBT.	07
	(b)	Discuss the operation of 3 phase half wave controlled rectifier with R-L load. Also Discuss the effect of free-wheeling diode in detail.	07
	(b)	OR Explain Turn-off mechanism in Thyristor. Explain commutation methods of Thyristors briefly.	07
Q.3	(a)	Explain 1-phase half bridge inverter with 90 degree mode of conduction. Draw necessary waveforms.	07
	(b)	Discuss operation of 3-phase ac to ac converter with star connected resistive load. OR	07
	(b)	Classify power factor improvement methods for phase controlled rectifiers. Explain Any one.	07
Q.4	(a)	 Explain the following PWM methods for control of single phase inverter 07 Single pulse width modulation. 	07
	(b)	 Sinusoidal pulse width modulation. Briefly discuss the performance characteristics of Induction Motor. OR 	07
	(b)	Briefly discuss the excitation angle control method for power factor improvement With neat sketch and necessary waveforms.	07
Q.5	(a) (b)	Briefly discuss the operation of single phase semi converter d.c. drives. Discuss about choice of A.C. and D.C. drives in detail.	07 07
	(b)	OR Explain control mode of DC-DC converter drives.	07
