Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII(OLD) • EXAMINATION - WINTER 2016

S	ubje	et Code: 170801 Date: 29/11/2016	
T	•	ct Name: Power Electronics and Industrial Drives 10:30 AM to 01:00 PM Total Marks: 70 ions:	
		 Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q.1	(a) (b)	Explain Two transistor analogy of SCR in detail. Draw symbols and V-I characteristics of following Power devices. (1) SCR, (2) BJT, (3) IGBT and (4) GTO.	
Q.2	(a) (b)		
		(1) Form Factor (2) Ripple Factor	
		(3) Rectification Efficiency (4) Transformer utilization factor	
		(5) Peak inverse voltage for SCR T ₁	
		OR	
	(b)	What is VSI? Describe the operation of single phase half bridge VSI with waveforms.	07
Q.3	3 (a) Discuss the operation of 3-Phase half wave controlled rectifier with R-discuss the effect of free-wheeling diode in detail.		07
	(b)	 Explain the following PWM methods for control of single phase inverter. Single pulse width modulation. Sinusoidal pulse width modulation. 	07
Q.3	(a)	OR Draw and explain 1-Phase half-wave controlled rectifier with R load. Derive the	07
Q.	(a)	equation of RMS load voltage also.	07
	(b)	Briefly discuss the 120 degree operation of inverter circuit with appropriate waveforms.	07
Q.4	(a)	Discuss the operation of 3-Phase ac to ac converter with star connected resistive load.	07
	(b)	Briefly describe the operation of single phase cycloconverter with necessary waveforms.	07
		OR	
Q.4	(a) (b)	Write a short note on single- phase separately excited drives. Difference between Power BJT and Power MOSFET.	07 07
Q.5	(a) (b)	Briefly discuss the performance characteristics of induction motor. Write a short note on three- phase separately excited drives. OR	07 07
Q.5	(a) (b)	What is commutation? Explain commutation methods of Thyristor briefly. Define Chopper and explain step-up chopper in detail.	07 07
