Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 160902 **Date: 29-11-2013**

Subject Name: Power Electronics-II

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.**

Q.1	(a)	Draw the power circuit of a parallel inverter and discuss its operation. Also explain how voltage control can be obtained with this inverter.	07
	(b)	List the commonly used PWM technique for voltage waveform and control of inverter. Explain any one in details.	07
Q.2	(a)	Describe using a neat circuit diagram, waveform and operation of PWM inverter and also explain how the output voltage can be controlled in this scheme.	07
	(b)	Explain the operation of a single phase voltage controller supplying R-L load when the firing angle " α" is (1) less than the load angle Φ (2) equal to load angle Φ (3) greater than load angle Φ.	07
		OR	
	(b)	Write a brief note on 1 phase AC voltage controller with PWM control with necessary waveforms.	07
Q.3	(a)	A three phase bridge inverter has 180° conduction interval for it's SCRs. Draw it's power circuit and state the conduction sequences of the SCRs with necessary waveforms.	07
	(b)	Draw the torque speed characteristics of 3 phase Induction motor and explain the following regions. (1).Plugging (2).Motoring (3).Generating.	07
		OR	
Q.3	(a)	Distinguish VSI and CSI and specify their applications.	07
	(b)	Classify the various control strategies for speed control of 3 phase induction motor. Explain the operation of a constant V/F control for the Induction motor with neat schematic diagram.	07
Q.4	(a)	Describe the principle of working of a single phase to single phase bridge type step down cycloconverter feeding R-L load.	07
	(b)	Describe in brief matrix converter.	07
		OR	
Q.4	(a)	Distinguish circulating current mode and non circulating current mode with cyclo converter.	07
	(b)	State the various points of comparisons and their choice/criterion for selection between AC and DC drives.	07
Q.5	(a)	Explain the operation of a self controlled (closed loop) synchronous motor drive fed from a load commutated inverter to control the speed of synchronous motor with necessary schematic diagram.	07
	(b)	Draw the neat circuit diagram and explain the speed control of 3 Ø Induction motor by static Scherbius system.	07
		OR	
Q.5	(a)	State the advantages of HVDC over conventional AC transmission system. Draw the schematic diagram of basic HVDC transmission system and explain in brief.	07
	(b)	Draw the circuit for a static DC circuit breaker and discuss its advantages and disadvantages.	07

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