Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2014

Subject Code:170801 **Date: 22-05-2014**

Subject Name: Power Electronics and Industrial Drives

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)	Briefly state and discuss the various schematics of single phase ac to ac voltage controller.	**7**
	(b)	Explain full wave controller with R-L load. Draw the necessary wave-form.	**7**
Q.2	(a)	Draw the schematic arrangement of full wave rectifier with R-L load and back emf E. Draw its waveform for load voltage V_L and Load Current I_L . Write down the formulae for rms diode current I_r , and average diode current $I_{d.}$ for discontinuous load current.	**7**
	(b)	Briefly explain the voltage protection by selenium diode and metal oxide varistors	**7**
		OR	
	(b)	Briefly explain the gate driver circuits for thyristors.	
Q.3	(a)	What is VSI ? Describe the operation of single phase half bridge VSI. Also state the switching state table for the same.	**7**
	(b)	Briefly discuss the operation of on off controller with neat sketch of its waveform	**7**
		OR	
Q.3	(a)	.Explain the operation of 4 switch Single Phase Inverter with usual notations.	**7**
	(b)	What is cyclo converter ? state the area of its application. Briefly discuss the operation of single phase cyclo converter along with its voltage and current waveform for resistive load.	**7**
Q.4	(a)	Explain the selective harmonic elimination technique for VSI.	**7**
	(b)	Briefly discuss the 120 degree operation of inverter circuit with appropriate waveforms.	**7**
		OR	
Q.4	(a)	Discuss the class B operation of Chopper Circuit.	**7**
	(b)	Give comparison between current source inverter and voltage source inverter.	**7**
Q.5	(a)	Explain slip-power recovery by Static Scherbius method for speed control of induction motor.	**7**
	(b)	Explain V/f control of induction motor drives Give its merits and demerits.	**7**
		OR	
Q.5	(a)	Discuss the rotor voltage control for slip ring induction motor	**7**
	(b)	Discuss about choice of AC and DC drive in detail	**7**

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