Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2160902 **Date:11/05/2016**

Subject Name: Power Electronics – II

Time: 10:30 AM to 01:00 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)**	Explain 3 phase inverter operation for 180˚ with the gate voltage and phase voltage waveform.	**07**
	(b)	What are line commutated inverters? How do they operate? Explain the difference between line commutated and force commutated inverters.	**07**
Q.2	**(a)**	List various PWM methods used in inverters for Harmonic reduction and explain Sinusoidal Pulse Modulation with necessary waveforms.	**07**
	(b)	Describe the working of a single phase half bridge inverter. What is its main drawback? Explain how this drawback is overcome.	**07**
		OR	
	(b)	Describe the working of a single phase parallel inverter with relevant circuit and waveforms.	**07**
Q.3	**(a)**	Explain the working of single phase ac voltage controller catering R-L load, along with the needed waveform. Derive its equation for the average output voltages.	**07**
	(b)	Describe the working of a two stage sequence control of voltage controller for both R and RL load.	**07**
		OR	
Q.3	**(a)**	What is an AC voltage controller? A single phase voltage controller using two SCRs in antiparallel must have its trigger sources isolated from each other. Why? Explain with suitable diagram.	**07**
	(b)	A singe phase voltage controller has input voltage of 230V,50Hz and a load of R=15Ω. For 6 cycle on and 4cycle off, determine (a) rms output voltage, (b) input power factor, (c) average and rms thyristor currents.	**07**
Q.4	**(a)**	Explain the basic principle of operation of a cycloconverter with neat equivalent circuit diagram.	**07**
	(b)	What is load commutated cycloconverter? How does it differ from line commutated cycloconverter?	**07**
		OR	
Q.4	**(a)**	Give the comparison between a cycloconverter and a dc link converter.	**07**
	(b)	A three pulse cycloconverter feeds a single phase load of 190V,45A at a power factor of 0.7 lagging. Determine: (a) the required supply voltage, (b) thyristor RMS current and PIV (c) power factor of the supply current.	**07**
Q.5	**(a)**	Write a short note on V/F control of an induction motor..	**07**
	(b)	Draw the neat circuit diagram and explain the speed control of 3 phase induction motor by rotor resistance control method using chopper.	**07**
		OR	
Q.5	**(a)**	Write a note on speed control of Synchronous motor employing cycloconverter.	**07**

(b) Explain the close loop control of induction motor. **07**

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