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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI- EXAMINATION – SUMMER 2016

Subject Code:160902 **Date:21/05/2016**

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)**	Describe the basic principle of operation of a single phase to single phase bridge type cycloconverter for continuous conduction.	**07**
	(b)	Draw the power circuit of three phase inverter. State the sequence of conduction of SCR's for 180^0 conduction mode and draw necessary waveforms.	**07**
Q.2	**(a)**	Explain the basic principle of single phase bridge inverter. Also draw necessary waveforms for operation of inverter with RL load.	**07**
	(b)	A single phase half bridge inverter has a resistive load of 3Ω and DC input voltage is 24V. Determine : 1. Total harmonic distortion. 2. Distortion factor. 3. Harmonic factor & Distortion factor of lower order harmonics.	**07**
		OR	
	(b)	Define the following terms: 1. Harmonic factor 2. Total Harmonic Distortion (THD) 3. Distortion Factor 4. Lower order harmonic.	**07**
Q.3	**(a)**	State various methods to control voltage in single phase inverter. Explain any one in brief.	**07**
	(b)	Explain the closed loop speed control of synchronous motor drive operating on cycloconverter.	**07**
		OR	
Q.3	**(a)**	Explain the operation of static DC circuit breaker.	**07**
	(b)	Analyze the output waveform of single phase AC voltage regulator into various harmonics with Fourier series & find expression for the amplitude of nth harmonic, V_{nm} & its phase Φ_n.	**07**
Q.4	**(a)**	Write a short note on classification of inverter.	**07**
	(b)	List various schemes for speed control of induction motor & explain V/f method of speed control.	**07**
		OR	
Q.4	**(a)**	Compare the following. 1. Cycloconverter & DC link inverter. 2. Voltage source inverter & Current source inverter.	**07**
	(b)	Explain static Kramer system for slip power recovery.	**07**
Q.5	**(a)**	Discuss the factors for selection of AC/DC drive for various applications with suitable example.	**07**
	(b)	What are FACT's devices? Explain any one in brief.	**07**
		OR	
Q.5	**(a)**	Write a short note on battery charging regulator.	**07**

(b) State the advantages, disadvantages & applications of AC voltage controller. **07**