Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:170801 **Date:16/05/2016**

Subject Name:Power Electronics and Industrial Drives

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)**	Explain 1-phase half bridge inverter with 120 degree mode of conduction. Draw necessary Waveforms.	**07**
	(b)	Explain the following PWM methods for control of single phase inverter a) Single pulse width modulation. b) Sinusoidal pulse width modulation	**07**
Q.2	**(a)**	Classify power factor improvement methods for single phase controlled rectifiers. Explain Any one.	**07**
	(b)	Discuss operation of three phase inverter in 180 mode of conduction.	**07**
		OR	
	(b)	Draw the I-V characteristics of the following: (1) Power diode (2) SCR (3) BJT (4) IGBT (5) MCT (6) GTO (7) SIT	**07**
Q.3	**(a)**	Briefly discuss the operation of on off controller (Integral Cycle Controller) with neat sketch of its waveform.	**07**
	(b)	What is cycloconverter? State the area of its application. Briefly discuss the operation of single phase cycloconverter along with its voltage and current waveform for resistive load.	**07**
		OR	
Q.3	**(a)**	What is DC drive? Discuss about controlled rectifier and DC-DC converter fed drive.	**07**
	(b)	Explain control mode of DC-DC converter drives.	**07**
Q.4	**(a)**	Discuss about choice of AC and DC drive in detail.	**07**
	(b)	Explain V/f control of induction motor drives Give its merits and demerits.	**07**
		OR	
Q.4	**(a)**	Discuss the rotor voltage control for slip ring induction motor.	**07**
	(b)	Give comparison between current source inverter and voltage source inverter.	**07**
Q.5	**(a)**	Draw and explain the structure of SCR. Also explain principal of operation and I- V characteristics of SCR and Gate Driver Circuit on a SCR.	**07**
	(b)	Discuss the role of snubber circuit from protection aspect	**07**
		OR	
Q.5	**(a)**	Draw and explain full wave controlled rectifier with the inductive load using required waveforms and equations	**07**
	(b)	Briefly state and discuss the various schematics of single phase ac to ac voltage controller with R Load.	**07**

****