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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2162409 **Date: 03/05/2017**

Subject Name: Power Electronic Circuits – 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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Inverter converts _____ into _____.	
	2	Diode clamp multilevel inverter is also called _____.	
	3	What is rms value of square wave having amplitude A.	
	4	Generally which semiconductor switch is used for AC Voltage controllers?	
	5	Generally which semiconductor switch is used for DC to AC converters?	
	6	Which harmonic is always absent in three phase inverter output Waveform?	
	7	Why reverse conducting diodes are necessary in Parallal with semiconductor switch in inverters?	
	8	How many same rating clamping diodes are required for level 5 level diode clamp multilevel inverter?	
	9	How many switches are simultaneously conducting in 120 degree mode conduction on three phase inverter?	
	10	Out put frequency of inverter outpt is varied by varing ___.	
	11	Out put voltage of inverter is varied by_____.	
	12	If output frequency of single phase full bridge inverter is 'f' , what is the frequency of switch current?	
	13	A single SCR is effectively ____ quadrant switch.	
	14	A single IGBT is effectively ____ quadrant switch.	
Q.2	**(a)**	Define even and odd symmetry of waveform.	**03**
	(b)	Define half wave and quarter wave symmetry of waveform.	**04**
	(c)	Explain single phase full bridge inverter with R load and derive THD of output voltage waveform.	**07**
		OR	
	(c)	Write advantages and applications of active front-end (AFE) rectifiers.	**07**
Q.3	**(a)**	Sketch load current waveform of single phase bridge inverter with RL load.	**03**
	(b)	Draw and briefly explain five level cascade type multilevel inverter.	**04**
	(c)	Derive frequency domain fourier equation of square wave inverter output.	**07**
		OR	
Q.3	**(a)**	Explain importance of dead band.	**03**
	(b)	List various methods to control inverter output.	**04**
	(c)	Explain harmonic reduction by multiple pulse width modulation for unipolar pulse width modulation.	**07**

Q.4	**(a)**	Explain THD and its significance.	**03**
	(b)	Draw waveform of Sine PWM for three phase inverter.	**04**
	(c)	Explain 180 degree mode three phase inverter.	**07**

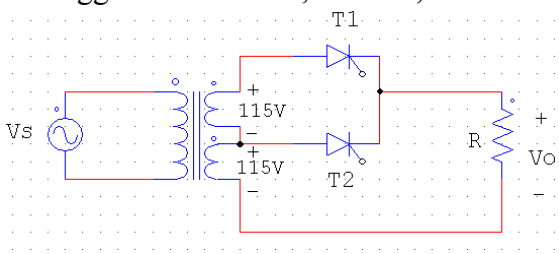
OR

Q.4	**(a)**	Draw Sine PWM for single phase inverter.	**03**
	(b)	Write a short note on SVPWM.	**04**
	(c)	Explain principal of McMurray Bedford Inverter in detail.	**07**

Q.5	**(a)**	Define HFn and its significance.	**03**
	(b)	Explain L-type ZCS resonant converter with circuit diagram and waveforms.	**04**
	(c)	Explain single phase AC voltage control by phase angle control with necessary diagram and waveform.	**07**

OR

Q.5	**(a)**	Explain ZVS and its significance.	**03**
	(b)	Draw output voltage of following circuit if T1 is triggered at wt= 0, 2π ,4π….. and T2 is triggered at wt = 30, 2π + 30, 4π + 30…	**04**



	(c)	Explain single phase AC voltage control by integral cycle control with necessary diagram and waveform.	**07**

****