Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV EXAMINATION – WINTER 2015

S	ubjec	t Code: 142402 Date:06/01/2016	
Su T: In	ubjec ime: structi	et Name: Fundamentals of Power Electronics 02:30pm to 05:00pm Total Marks: 70 ions:	
		 Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q.1	(a) (b)	Draw symbol, equivalent circuit & UJT V-I characteristics. Define followings:- (1) Latching current (2) Commutation (3) Gate Power loss	04 03
	(c)	List the characteristics of an ideal switch.	07
Q.2	(a)	Define Power Electronics. Draw the block diagram of Power Electronics System and explain the role of each component in details.	07
	(b)	Explain V-I Characteristics of SCR and Derive equation of Anode current using two transistor analogy of SCR.	07
		OR	
	(b)	Derive the expression for frequency of UJT relaxation oscillator.	07
Q.3	(a)	Write a detail note on:- TURN ON methods of SCR.	06
	(b)	Discuss causes and effect of di/dt and dv/dt problem for Thyristor and Explain its remedies.	08
		OR	
Q.3	(a) (b)	Draw the symbol and characteristics of MCT, TRIAC, LASCR and SIT. Draw Schematic diagram and symbol of IGBT. Explain in detail the operation of IGBT.	06 08
Q.4	(a)	Explain with necessary circuit and waveforms the working of single-phase half- wave controlled rectifier with R load.	07
	(b)	Define Chopper. Enlist and Explain the control strategies employed in DC chopper for operating the switches.	07
		OR	
Q.4	(a)	Explain with necessary circuit and waveforms the working of single-phase half- wave controlled rectifier with RL load.	07
	(b)	Discuss principle and working of SMPS with the help of block diagram.	07
Q.5	(a)	Compare 1-phase & 3-phase uncontrolled rectifier.	07
	(b)	Draw and explain single phase MC-MURRAY Inverter circuit with voltage and current waveforms.	07
		OR	
Q.5	(a) (b)	Explain the principle of Integral Cycle Control. What is inverter? Explain Classification of inverter in details. List the requirement of practical inverter.	07 07
