GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Sul Sul Tin	oject oject ne: 1	Code: 182405Date: 09/05/2013Name: Digital Control of Power Processing Circuits0:30 am TO 01:00 pmTotal Marks: 70	
mst	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Elaborate the importance of Digital Control in modern Power Electronics indicating its advantages over analog control.	07
	(b)	Explain Space Vector Modulation technique to implement PWM in $3-\Phi$ switching converters giving its advantages.	07
Q.2	(a)	Describe the implementation of digital control in a 1- Φ UPS with a neat block diagram.	07
	(b)	Explain the working principle of operation of half bridge VSI with a proper schematic diagram and waveforms.	07
	(b)	OR Discuss the effects of switching dead times and suggest remedies for it	07
Q.3	(a) (b)	Discuss analog PI current controller with appropriate block diagram. Write a note on Parks transformation.	07 07
Q.3	(a) (b)	Explain the non-linear current control technique. Describe $\alpha\beta$ transformation with necessary equations.	07 07
Q.4	(a) (b)	Explain the typical organization of a digital current controller. Draw and explain dead beat current control loop and derive necessary equations.	07 07
Q.4 Q.4	(a) (b)	Discuss aliasing and its effects on signals. Explain Quantization and Arithmetic nosie.	07 07
Q.5	(a) (b)	Explain repetitive based voltage controller. Draw and explain the typical organization of Active Power Filter.	07 07
Q.5	(a) (b)	Explain DFT based voltage controller. Draw only, the 3- Φ inverter output voltage vectors and their projections on π plane.	07 07