Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER • 2015

Subject Code: 182405 **Date:05/05/2015**

Subject Name: Digital Control of Power Processing Circuits

Time:10.30AM-01.00PM **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)**	Draw and explain in brief, the principle of operation of full bridge VSI along with the required basic components.	**07**
	(b)	Discuss about the digital PWM technique and compare it with analog PWM technique.	**07**
Q.2	**(a)**	Compare analog and digital control. Explain the importance of digital control in modern power electronics.	**07**
	(b)	Explain low level control technique of VSI using naturally sampled PWM.	**07**
		OR	
	(b)	Explain low level control technique of VSI using uniformly sampled PWM.	**07**
Q.3	**(a)**	Explain the simplified dynamic model of delays.	**07**
	(b)	Draw and explain dead beat current control loop with necessary equations.	**07**
		OR	
Q.3	**(a)**	Explain the discretization strategies of proportional integral controller.	**07**
	(b)	Draw and explain the hysteresis current control hardware organization.	**07**
Q.4	**(a)**	Compare linear current control by PI controller with digital current control by PI controller.	**07**
	(b)	Discuss the effects of the computation delay. How it can be minimized?	**07**
		OR	
Q.4	**(a)**	Discuss aliasing and its effects on signals.	**07**
	(b)	Draw and explain the typical organization of 3-Φ VSI SVM based controller.	**07**
Q.5	**(a)**	Explain the large and narrow bandwidth controllers.	**07**
	(b)	Draw and explain the typical organization of Active Power Filter.	**07**
		OR	
Q.5	**(a)**	Explain DFT based voltage controller.	**07**
	(b)	Explain Quantization and Arithmetic noise.	**07**

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