Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– IV EXAMINATION – SUMMER 2013

Subject Code: 744501 **Date:14/05/2013**

Subject Name: Harmonic Elimination technique

Time: **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)**	Describe in brief effects of harmonics on transmission system?	**07**
	(b)	Discuss briefly power quality indices under non-sinusoidal conditions?	**07**
Q.2	**(a)**	Distinguish between linear and non linear loads. Give their examples.	**07**
	(b)	Write down the design parameters for the single tuned filter and explain the quality factor?	**07**
		OR	
	(b)	Define harmonics and discuss voltage versus current distortion?	**07**
Q.3	**(a)**	Describe briefly the controlling of 3 - è, three wire shunt active filter with d ï q modeling?	**07**
	(b)	Discuss harmonic distortion limits for voltage and current in conformance with IEC limits.	**07**
		OR	
Q.3	**(a)**	How harmonics affects the performance of transformer?	**07**
	(b)	Draw and explain the harmonic sources generated in AC Drives and also discuss impact of operating condition?	**07**
Q.4	**(a)**	List out the type of hybrid filters? Explain the operation of the hybrid passive series with shunt active filter?	**07**
	(b)	Explain the operation of the unified power quality conditioner with current control?	**07**
		OR	
Q.4	**(a)**	Explain the operation of the series active filter with appropriate diagrams and equations?	**07**
	(b)	What are all the modifications to be done to obtain harmonic cancellation mode?	**07**
Q.5	**(a)**	Relevant to the harmonic measurement explain following: a. Need to measure wave form distortion b. How to carry out harmonic measurement	**07**
	(b)	Discuss different facts related to harmonic propagation for harmonic analysis?	**07**
		OR	
Q.5	**(a)**	Derive the expression to find the switching angle for 9 ï level cascaded MLI to eliminate 5th, 7th and 11th order harmonics from the line voltage?	**07**
	(b)	Explain sinusoidal (carrier based) PWM, which are all parameters to be consider for a selecting the switching frequency?	**07**

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