Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1722901 **Date: 16-06-2014**

Subject Name: Advanced Power Converters and Control

Time: 02:30 pm - 05:00 pm **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)**	Explain control characteristics of converters used in HVDC transmission system.	**07**
	(b)	Explain 5 level capacitor clamped multi-level inverter with neat diagram.	**07**
Q.2	**(a)**	The full bridge series resonant inverter with unidirectional switches has L = 45 εH, C = 7 εF, and R = 4Ý. The frequency of output voltage is 4.5 kHz and DC input is 200 Volt. SCR turn off time is 15 εSec. Calculate: (a) Circuit turn off time, (b) Maximum possible output frequency and (c) Capacitor voltage.	**07**
	(b)	Describe M type ZCS resonant converter with neat diagram and appropriate waveforms.	**07**
		OR	
	(b)	With neat circuit diagram and waveform discuss class E resonant inverter.	**07**
Q.3	**(a)**	Draw circuit diagram and output voltage phasor diagram of 12-pulse converter. Explain 5th and 7th harmonics elimination in 12-pulse converter.	**07**
	(b)	What is redundancy in case of cascaded multi-level inverter? Explain with appropriate example.	**07**
		OR	
Q.3	**(a)**	Discuss various transformer connections for multi-pulse converter.	**07**
	(b)	List the application of multilevel inverter and explain one in detail.	**07**
Q.4	**(a)**	Discuss pulse width modulation technique for matrix converter.	**07**
	(b)	Compare AC and DC transmission lines. And discuss HVDC transmission.	**07**
		OR	
Q.4	**(a)**	Discuss venturini control method for matrix converter in brief.	**07**
	(b)	What is need of small signal model? Explain small signal model of converter circuit.	**07**
Q.5	**(a)**	Explain voltage control mode of DC-DC converters.	**07**
	(b)	Explain high frequency link integral half cycle converter with neat diagram.	**07**
		OR	
Q.5	**(a)**	Discuss the basic concept of multi pulse converter. Explain how the number of pulses can be increased from available three phase supply.	**07**
	(b)	What are the advantages of multi-level inverter w.r.t. two-level inverter?	**07**

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