Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 714505N **Date: 06-01-2014**

Subject Name: Power Conditioning

Time: 10.30 am – 01.00 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)**	Describe the push pull converter with neat circuit diagram and waveform.	**07**
	(b)	What is redundancy in UPS? Explain the parallel redundancy.	**07**
Q.2	**(a)**	Explain the operation of fly back converter with the required diagram and waveform.	**07**
	(b)	Explain single phase boost converter based active PFC circuit.	**07**
		OR	
	(b)	1) Write the difference between the half bridge and full bridge converter.	**04**
		2) Write the advantage of on line UPS over off line UPS?	**03**
Q.3	**(a)**	1. Explain following terminology a. Band pass filter b. Band stop filter c. High pass filter d. Low pass filter	**07**
	(b)	Giving block diagram and control algorithm, explain how shunt active filters are used for sinusoidal current control.	**07**
		OR	
Q.3	**(a)**	Explain in details about the effect of any two non linear loads on power quality.	**07**
	(b)	Explain the basic operation of DSP control of active power filter.	**07**
Q.4	**(a)**	Discuss V-I characteristic of STATCOM. Explain the phenomena of power exchange between STATCOM and an AC system connected to it.	**07**
	(b)	With neat diagram, describe the power supply for steel camera.	**07**
		OR	
Q.4	**(a)**	Discuss harmonic distortion limit as per IEEE-519:1992.	**07**
	(b)	Define power quality & Explain different issue of power quality.	**07**
Q.5	**(a)**	Enlist different methods of induction heating & Explain Vertical core type induction furnace.	**07**
	(b)	A low frequency induction furnace operating at 10 volts in the secondary circuit takes 500kW at 0.5 pf when the hearth is full. If the secondary voltage be maintained at 10 volts. Estimate the power absorbed and the power factor when the hearth is half full. Assume the resistance of the secondary circuit to be thereby doubled and the reactance to remain the same.	**07**
		OR	
Q.5	**(a)**	Draw the circuit diagram for conventional X ray generator and explain	**07**

resonant converter used for it.

(b) Explain the DSP control of fly back converter. **07**

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