Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1724502 **Date: 09/07/2012**

Subject Name: Power Electronics-II

Time: 10:30 am – 13:00 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)**	List the application of multilevel inverter and explain one in detail.	**07**
	(b)	Explain half bridge series resonant inverter with unidirectional switches.	**07**
Q.2	**(a)**	Derive formula of power factor for non linear load and explain in terms.	**07**
	(b)	Explain the frequency response of parallel loaded resonant inverter.	**07**
		OR	
	(b)	Explain the full bridge series resonant inverter with bidirectional switches in non overlapping mode.	**07**
Q.3	**(a)**	Explain H-bridge 5-level Inverter.	**07**
	(b)	Explain zero voltage switching (ZVS) resonant converter.	**07**
		OR	
Q.3	**(a)**	Derive the formula for instantaneous current in series resonant inverter. Also derive the time required to reach peak value of current.	**07**
	(b)	The full bridge series resonant inverter with unidirectional switches has L = 45 μH, C = 7 μF, and R = 4 Ω. The frequency of output voltage is 4.5 kHz and DC input is 200 Volt. SCR turn off time is 15 μSec. Calculate: (a) Circuit turn off time, (b) Maximum possible output frequency and (c) Capacitor voltage.	**07**
Q.4	**(a)**	Explain buck boost topology for PFC converter.	**07**
	(b)	Explain with diagram different types of active power filter.	**07**
		OR	
Q.4	**(a)**	Draw and explain how single phase PFC topology can be used to implement three phase PFC solution.	**07**
	(b)	Classify the AC-DC multipulse converter based on phase shift. Draw and explain 12 pulse series type diode rectifier.	**07**
Q.5	**(a)**	Explain the steps to design the inductor used in dc-dc converter.	**07**
	(b)	Discuss the selection factor for the magnetic component.	**07**
		OR	
Q.5	**(a)**	Discuss the steps to design EMI filter.	**07**
	(b)	What is a matrix converter? Explain with three phase circuit supplying three phase load.	**07**

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