Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-VII Examination-Nov/Dec.-2011

Subject code: 172403 **Date: 24/11/2011**

Subject Name: Power Processing Circuits-II

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)**	List and explain performance parameters of inverter. Explain the principle of operation of inverter using single-phase half bridge inverter with necessary waveforms.	**07**
	(b)	Explain the Mc-Murray Bedford half bridge inverter with neat waveforms.	**07**
Q.2	**(a)**	List the main drawbacks of controlled rectifiers. Explain the basics of active front- end rectifier. List the advantages of active front-end rectifier.	**07**
	(b)	Explain the types of standby ac supply with block diagram.	**07**
		OR	
	(b)	List the types of batteries used for UPS. Explain the battery charging process in detail.	**07**
Q.3	**(a)**	Explain sinusoidal pulse-width-modulation technique used for voltage control of single-phase inverters.	**07**
	(b)	Explain phase dead-banding and draw the modulation reference waveforms for it. Explain triplen injection modulation.	**07**
		OR	
Q.3	**(a)**	Explain the space vector with its representation. Explain the space vector sequence with waveforms.	**07**
	(b)	Explain harmonic injected modulation and trapezoidal modulation with waveforms.	**07**
Q.4	**(a)**	Give the comparison between 180° and 120° mode of conduction of 3-phase inverters.	**07**
	(b)	Explain the single-phase multi level cascaded H-bridge inverter and its features.	**07**
		OR	
Q.4	**(a)**	Explain M-type ZCS resonant converter with circuit diagram and waveforms.	**07**
	(b)	Explain the principle of operation and features of flying capacitor 4-level bridge type multilevel inverter with necessary diagrams.	**07**
Q.5	**(a)**	Explain integral cycle control with waveforms. Derive expressions for V_{or}, I_{Tr} and input power factor.	**07**
	(b)	Explain the basic series resonant inverter with neat circuit and waveforms. Write the equations for design of series inverter.	**07**
		OR	
Q.5	**(a)**	Explain the single-phase bidirectional controller having RL load with neat waveforms.	**07**
	(b)	Explain the operation of bridge type single-phase to single-phase cycloconverter with continuous load current. Draw neat waveforms.	**07**

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