Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (OLD) – • EXAMINATION – SUMMER 2016

Subject Code: 1724502 **Date:18/05/2016**

Subject Name: Power Electronics-II

Time:10:30 am to 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)**	Explain need of 3-Ø to 3-Ø Matrix Converter with necessary circuit and Switching Matrix Diagram.	**07**
	(b)	Explain problem associated with respect to Power Factor in Single Phase Line Commutated Rectifier. Suggest topology to overcome associated problem. Draw necessary Circuit and Waveform in support.	**07**
Q.2	**(a)**	The Class E Resonant Inverter has Vs = 12 Volts and R = 10 q . The Switching Frequency fs = 25 KHz. Determine: (a) the Optimum values of L, C, Ce and Le, (b) Damping Factor and (c) Resonant Frequency. Assume Q = 7.	**07**
	(b)	Explain operation of Six Pulse Bridge Converter, having Resistive Load, with necessary Power Circuit and Waveforms.	**07**
		OR	
	(b)	Justify need of Twelve Pulse Converter. Also explain Full Controlled Series Dual Converter with neat labeled Power Circuit only.	**07**
Q.3	**(a)**	With respect to Magnetic Component Design explain importance of Hysteresis Loss. Support answer with suitable diagram.	**07**
	(b)	Explain design procedure for Inductor. Draw necessary Flow chart in context of answer.	**07**
		OR	
Q.3	**(a)**	With respect to Magnetic Component Design explain importance of Skin Effect. Support answer with suitable diagram.	**07**
	(b)	Explain design procedure for Transformer. Draw necessary Flow chart in context of answer.	**07**
Q.4	**(a)**	Explain Series loaded dc-dc Resonant Converter in Continuous Conduction Mode. Draw necessary Circuit and Waveforms in support.	**07**
	(b)	Explain Zero-Voltage Switching Resonant Converter. Draw various Switching Configuration with necessary Waveforms in support.	**07**
		OR	
Q.4	**(a)**	Explain Parallel loaded dc-dc Resonant Converter in Continuous Conduction Mode. Draw necessary Circuit and Waveforms in support.	**07**
	(b)	Explain Resonant DC Link Inverter with necessary Circuit and Waveforms.	**07**
Q.5	**(a)**	Explain operation of Neutral Point Clamped Multilevel Inverter. Draw neat labeled diagram in support	**07**

	(b)	List various Control Strategies for Power Converters. Explain sliding Mode Control in context of the same.	**07**

OR

Q.5	**(a)**	Explain operation of Cascade type Multilevel Inverter. Draw neat labeled diagram in support	**07**
	(b)	Explain operation of Single Phase Boost Rectifier as Power Factor Conversion Topology. Draw necessary circuit in support.	**07**

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