Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (OLD) EXAMINATION – SUMMER 2017

Subject Code: 1724502 **Date:10/05/2017**

Subject Name: Power Electronics II

Time: 10:30 A.M. to 01:00 P.M. **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 operation of 3-Ø to 3-Ø Matrix Converter. Also draw Switching Matrix Symbol in support.	**07**
	(b)	List various Power Factor Improvement Techniques. Explain Extinction Angle Control with necessary diagram and waveforms.	**07**
Q.2	**(a)**	List various drawbacks of Basic Series Resonant Converter. Draw necessary supportive circuit to overcome mentioned drawbacks.	**07**
	(b)	Draw necessary circuit and switching sequence for 3-Level Flying Capacitor type Converter.	**07**
		OR	
	(b)	Draw necessary circuit and switching sequence for 3-Level Neutral Point Clamped Inverter.	**07**
Q.3	**(a)**	Explain operation of Six Pulse Bridge Converter with neglecting Source Inductance, L_s. Draw necessary waveforms in support.	**07**
	(b)	Explain Thermal consideration with respect to design and selection of Magnetic Component. Write necessary equations in support.	**07**
		OR	
Q.3	**(a)**	Justify need of Twelve Pulse Converter. Draw necessary circuit and waveforms in support.	**07**
	(b)	With respect to Magnetic Circuit Design explain importance of Eddy Current Loss in Laminated Cores.	**07**
Q.4	**(a)**	Explain Half Bridge Series Loaded Resonant DC-DC Converter in Discontinuous mode of Operation. Draw necessary diagrams in support.	**07**
	(b)	Explain Zero Current Switching (ZCS) Resonant Converter with necessary circuit.	**07**
		OR	
Q.4	**(a)**	Explain Half Bridge Parallel Loaded Resonant DC-DC Converter in Discontinuous mode of Operation. Draw necessary diagrams in support.	**07**
	(b)	Explain Zero Voltage Switching (ZVS) Resonant Converter with necessary circuit.	**07**

Q.5	**(a)**	List various applications of Unity Power Factor Rectifiers. Explain any one in detail.	**07**
	(b)	Explain Resonant DC Link Inverter with Zero Voltage Switching. Draw necessary circuit and waveforms in support.	**07**

OR

Q.5	**(a)**	Explain Boost type Power Factor Correction (PFC) Circuit with adequate supportive diagrams.	**07**
	(b)	Explain High Frequency Link Integral Half Cycle Converter with necessary diagrams.	**07**

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