Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 712902N Date:17/05/2016

Subject Name: Power Processing Circuits

Time:02:30 pm to 05:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Notations used have usual meaning.**

Q.1	**(a)**	Explain construction and working of power MOSFET device in detail.	**07**
	(b)	What is safe operating area? Discuss SOA for bipolar junction transistor.	**07**
Q.2	**(a)**	Compare Integral cycle control with phase angle control for AC-AC control in all respect.	**07**
	(b)	Explain single phase to single phase Cyclo-converter with discontinuous current operation.	**07**
		OR	
	(b)	Explain three phase half wave controlled AC-DC converter circuit with waveforms.	**07**
Q.3	**(a)**	Explain working operation of dual converter with circulating mode. Draw appropriate waveforms.	**07**
	(b)	Discuss the working of DC-DC boost converter with appropriate waveforms.	**07**
		OR	
Q.3	**(a)**	Explain working of three phase inverter circuit with 120˚ conduction mode. Draw line voltage and phase voltage waveform.	**07**
	(b)	Discuss working operation of buck-boost DC-DC converter circuit with appropriate waveforms.	**07**
Q.4	**(a)**	Write a short note on ring connected Cyclo-converter circuit.	**07**
	(b)	Explain single pulse width modulation technique for single phase inverter circuit. Draw necessary waveforms.	**07**
		OR	
Q.4	**(a)**	Explain working principle of single phase AC-AC controlled converter with necessary waveforms.	**07**
	(b)	Write a brief note on effect of source inductance on AC-DC converter.	**07**
Q.5	**(a)**	Explain working of single phase semi-controlled converter with R-L load. Draw necessary waveforms.	**07**
	(b)	Discuss full bridge DC-DC converter with appropriate waveforms.	**07**
		OR	
Q.5	**(a)**	Write a short note on harmonics reduction in output of the inverter circuit.	**07**
	(b)	Explain sinusoidal pulsed width modulation technique for inverter.	**07**

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