Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD) • EXAMINATION – WINTER 2016

Subject Code:142402 **Date:24/11/2016**

Subject Name: Fundamentals of Power Electronics

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.**

Q.1	**(a)**	With the help of neat block diagram, explain the functional elements of power electronics system.	**07**
	(b)	Draw the V-I characteristics of TRIAC and explain its working principle.	**07**
Q.2	**(a)**	Draw symbols and V-I characteristics of (a) Diode (b) DIAC (c) BJT (d) LASCR (e) IGBT (f) MOSFET (g) SCR	**07**
	(b)	Write a detail note on:- TURN ON methods of SCR.	**07**
		OR	
	(b)	Explain dv/dt and di/dt protection of SCR	**07**
Q.3	**(a)**	Draw & explain Power circuit and transient response of Fast recovery diode.	**07**
	(b)	Draw the V-I characteristics of UJT and explain its working principle.	**07**
		OR	
Q.3	**(a)**	Compare between voltage source inverter(VSI) and current source inverter (CSI)	**07**
	(b)	Explain in detail Class-A Commutation with necessary waveforms	**07**
Q.4	**(a)**	Explain with necessary circuit and waveforms the working of single-phase half wave controlled rectifier with R load.	**07**
	(b)	Explain the basic principle of operation of cycloconverter with a neat equivalent circuit diagram.	**07**
		OR	
Q.4	**(a)**	Discuss principle and working of SMPS with the help of block diagram.	**07**
	(b)	With the help of circuit diagram, explain the working of step down chopper.	**07**
Q.5	**(a)**	Draw and explain single phase bridge inverter with necessary circuit and waveform.	**07**
	(b)	Draw and explain single phase MC-MURRAY Inverter circuit with voltage and current waveforms.	**07**
		OR	
Q.5	**(a)**	Describe the operation of 1-Ø half wave a. c voltage regulator with the help of voltage and current waveform.	**07**
	(b)	Compare 1-phase & 3-phase uncontrolled rectifier.	**07**

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