Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER VII– • EXAMINATION – SUMMER - 2016

Subject Code: X71102 **Date:25/11/2016**

Subject Name: Power Electronics

Time:10:30 AM to 1:00 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 the operation of the SCR using the two transistor analogy. Obtain the condition for breakdown of the device.	**07**
	(b)	Classify commutation techniques. Discuss class-C Commutation circuit for SCR.	**07**
Q.2	**(a)**	Describe the construction & working of IGBT. Also enumerate the advantage of IGBT over BJT & MOSFET.	**07**
	(b)	Explain the phase control SCR using UJT with necessary waveforms.	**07**
		OR	
	(b)	Briefly explain the series operation of SCR with necessary equations.	**07**
Q.3	**(a)**	Classify the chopper. List all types of chopper and explain any two in detail.	**07**
	(b)	Draw and explain single phase full converter with inductive load using necessary waveforms and equation.	**07**
		OR	
Q.3	**(a)**	Explain di/dt and dv/dt protection for thyristor.	**07**
	(b)	Explain three-phase half-wave controlled rectifier with resistive load.	**07**
Q.4	**(a)**	Describe three-phase bridge inverter with 180^0 mode of conduction.	**07**
	(b)	Explain working principle of Buck regulator with the help of circuit diagram and waveforms.	**07**
		OR	
Q.4	**(a)**	Explain single phase full bridge inverter with necessary waveforms.	**07**
	(b)	Discuss the principle of step down chopper with suitable waveforms.	**07**
Q.5	**(a)**	Describe Switched Mode Power Supply with necessary diagram in detail.	**07**
	(b)	List types of heating mechanism available and Explain any one in detail.	**07**
		OR	
Q.5	**(a)**	Describe UPS with necessary diagram in detail.	**07**
	(b)	Explain battery charger with necessary diagram.	**07**

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