Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (New) EXAMINATION – WINTER 2015

Subject Code:2132404 **Date:18/12/2015**

Subject Name: PRINCIPLES OF POWER ELECTRONICS

Time: 2:30pm to 5:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Give difference between signal and power BJT.	
	2	Give difference between CB and CC configuration of BJT.	
	3	Define commutation?.	
	4	Write equation of frequency for UJT relaxation oscillator.	
	5	What is the application of power electronics.?	
	6	What is the full form of LED.	
	7	Draw symbol of schottky diode.	
	8	What is the full form of LASCR.	
	9	What is the full form of PUT.	
	10	Enlist semiconductor material used to make power devices.	
	11	What is a photodiode?	
	12	What is GTO?.	
	13	Write full form of MCT?	
	14	Write any one application of RCT.	
Q.2	**(a)**	Explain concept of safe operating area (SOA)	**03**
	(b)	Draw SOA for (i) power transistor (ii) SCR.	**04**
	(c)	Draw the block diagram of power electronics system, Explain its building blocks and components.	**07**
		OR	
	(c)	Explain power transistor and it's V-I characteristics.	**07**
Q.3	**(a)**	What is the utility of Q-point?.	**03**
	(b)	Explain switching characteristics of a diode.	**04**
	(c)	Explain zener diode and LED.	**07**
		OR	
Q.3	**(a)**	Draw V-I characteristics of thyristor.	**03**
	(b)	Explain DC and AC load line concept.	**04**
	(c)	Explain fast recovery diode.	**07**
Q.4	**(a)**	Explain CLASS-F thyristor commutation technique in detail.	**03**
	(b)	Explain working principle of power BJT in details.	**04**
	(c)	Draw and explain input and output characteristics of a PNP transistor in CE configurations.	**07**
		OR	
Q.4	**(a)**	Explain construction of DIAC.	**03**
	(b)	Explain characteristics and application of TRIAC.	**04**

	(c)	Explain V-I characteristics of power BJT.	**07**
Q.5	**(a)**	Explain construction of enhancement type MOSFET.	**03**
	(b)	Explain working principle of MOSFET.	**04**
	(c)	Explain primary and secondary breakdown in thyristor in details.	**07**

OR

Q.5	**(a)**	Explain construction of n-channel FET.	**03**
	(b)	Explain working principle and operation of n-channel FET.	**04**
	(c)	Explain construction , characteristics and application of UJT.	**07**

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