

**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**

<b>Q.1</b>	<b>Short Questions</b>	<b>14</b>
	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.	
<b>Q.2</b>	(a) Explain concept of safe operating area (SOA)	<b>03</b>
	(b) Draw SOA for (i) power transistor (ii) SCR.	<b>04</b>
	(c) Draw the block diagram of power electronics system, Explain its building blocks and components.	<b>07</b>
	<b>OR</b>	
	(c) Explain power transistor and it's V-I characteristics.	<b>07</b>
<b>Q.3</b>	(a) What is the utility of Q-point?.	<b>03</b>
	(b) Explain switching characteristics of a diode.	<b>04</b>
	(c) Explain zener diode and LED.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Draw V-I characteristics of thyristor.	<b>03</b>
	(b) Explain DC and AC load line concept.	<b>04</b>
	(c) Explain fast recovery diode.	<b>07</b>
<b>Q.4</b>	(a) Explain CLASS-F thyristor commutation technique in detail.	<b>03</b>
	(b) Explain working principle of power BJT in details.	<b>04</b>
	(c) Draw and explain input and output characteristics of a PNP transistor in CE configurations.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain construction of DIAC.	<b>03</b>
	(b) Explain characteristics and application of TRIAC.	<b>04</b>

- (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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