Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code: 152401 **Date:15/12/2015**

Subject Name: Power Electronics Devices & Components

Time: 10:30am to 1:00pm **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 construction and working of Power Diode along with VI characteristics.	**07**
	(b)	Explain UJT as a relaxation oscillator.	**07**
Q.2	**(a)**	Draw the block diagram of Power Electronics System. Explain in brief the concept of Power & Energy.	**07**
	(b)	Draw the practical switch characteristics. And explain the concept of Safe Operating Area (SOA).	**07**
		OR	
	(b)	Discuss the requirement of Electrical Power Conversion and explain the concept of Power Processing.	**07**
Q.3	**(a)**	Explain Fast Recovery Diode. Give its applications.	**07**
	(b)	Explain the working principle and structure of Power BJT.	**07**
		OR	
Q.3	**(a)**	Explain P-N junction diode along with its I-V characteristics.	**06**
	(b)	Draw the input, output and switching characteristics of BJT	**08**
Q.4	**(a)**	Explain the two transistor model of thyristor.	**07**
	(b)	Explain the turn-on methods of thyristor.	**07**
		OR	
Q.4	**(a)**	Explain the over voltage and over current protection circuit for thyristor.	**07**
	(b)	What do you mean by commutation of thyristor? List different thyristor commutation techniques and define Holding & Latching current.	**07**
Q.5	**(a)**	Explain the construction and working of Power MOSFET.	**07**
	(b)	Explain the construction and working of IGBT.	**07**
		OR	
Q.5	**(a)**	Draw the symbol & structure of TRIAC and explain its working.	**07**
	(b)	Discuss the necessity of cooling in power switches. Also discuss in brief various heat sinks and mountings used for various power switches.	**07**

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