

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – WINTER 2013

Subject Code: 152401**Date: 27-11-2013****Subject Name: Power Electronics Devices and Circuits****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Notations/ symbols used have usual meanings.

Q.1	(a)	Draw the symbol and V-I Characteristics of the following : (i) LASCR (ii) GTO (iii) UJT (iv) PUT (v) TRIAC (vi) SCR (vii) DIAC.	07
	(b)	Derive an equation for oscillating frequency for an UJT relaxation oscillator.	07
Q.2	(a)	Define commutation. Explain Class A commutation method for a thyristor.	07
	(b)	Describe Turn-on mechanism for a Thyristor with necessary waveforms.	07
		OR	
	(b)	Discuss the various Turn-on methods for Thyristor.	07
Q.3	(a)	Describe reverse recovery characteristics of a diode with necessary diagram(s). Is parallel operation of P-N junction diode is possible?	07
	(b)	Discuss the switching performance of a Power MOSFET with relevant waveforms.	07
		OR	
Q.3	(a)	Describe the principle of operation of a Power Diode. State its applications.	07
	(b)	Enlist various driving circuit used for Power BJT and discuss any one of them.	07
Q.4	(a)	Write short note on:- (i) Opto-coupler (ii) An application of TRIAC.	07
	(b)	Explain various mounting techniques for Thyristors in detail.	07
		OR	
Q.4	(a)	Discuss switching characteristic of IGBT.	07
	(b)	Enlist factors responsible for un-reliable operation of a thyristor. Discuss remedies for any two of them.	07
Q.5	(a)	Discuss parallel operation of two Power MOSFETs.	07
	(b)	Draw and explain two transistor model of an SCR.	07
		OR	
Q.5	(a)	Write notes on :- (i) PIC (ii) RCT.	07
	(b)	Compare Power MOSFET with IGBT for various aspects.	07
