

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- Vth SEMESTER-EXAMINATION – MAY/JUNE - 2012****Subject code: 152401****Date: 01/06/2012****Subject Name: Power Electronics Devices & Instruments****Time: 02:30 pm – 05:00 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) Compare Power BJT with Thyristor for various aspects in tabular form. **07**
(b) In which mode TRIAC will be most sensitive? Discuss the same. **04**
(c) “Si is preferred over Ge to fabricate a thyristor”. Justify the above statement. **03**

- Q.2** (a) Define commutation. Explain Class F commutation method for a thyristor. **07**
(b) Derive an equation for oscillating frequency for an UJT relaxation oscillator. **07**

OR

- (b) Define power switch. Describe the following w.r.t. a switch: SOA, Losses in a practical switch. **07**

- Q.3** (a) Describe reverse recovery characteristics of a diode with necessary diagram(s). **07**
(b) Discuss the switching performance of a Power BJT with relevant waveforms. **07**

OR

- Q.3** (a) Describe the principle of operation of a Schottky diode. State its applications. **07**
(b) Draw the symbol and V-I Characteristics of the following : **07**

- i) LASCR
- ii) GTO
- iii) UJT
- iv) PUT
- v) TRIAC
- vi) SCR
- vii) DIAC

- Q.4** (a) Write short note on:- **07**
(i) Pin diode
(ii) Power IC.

- (b) Explain various mounting techniques for thyristor in detail. **07**

OR

- Q.4** (a) Sketch symbol and equivalent circuit of an IGBT. Describe its operation. **07**
(b) Enlist factors responsible for un-reliable operation of a thyristor. Discuss remedies for any two of them. **07**

- Q.5** (a) State merits of Power MOSFET. Also, discuss parallel operation of two Power MOSFETs. **07**

- (b) Draw and explain two transistor model of an SCR with necessary diagrams. **07**

OR

- Q.5** (a) Write notes on :- **07**
(i) SITH
(ii) RCT.

- (b) Describe Turn-on mechanism for a Thyristor with necessary waveforms. **07**
