

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-V • EXAMINATION – SUMMER • 2015**

**Subject code: 152401****Date: 02/05/2015****Subject Name: Power Electronics Devices & Circuits****Time: 02.30pm-05.00pm****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)** Discuss ideal switch characteristics. Enlist only various types of losses in an electronic switch. **07**

**(b)** Draw And Explain Building Block Of PES. **03**

**(c)** Explain Semiconductor Material For Power Switch. **04**

**Q.2 (a)** Explain Two Transistor Analogy Of Thyristor. **07**

**(b)** Discuss Turn – ON mechanism for a thyristor with neat sketches. **07**

**OR**

**(b)** Enlist commutation methods of thyristor. Discuss Class – B commutation method in detail. **07**

**Q.3 (a)** Describe **10**

(i) construction of a Schottky diode.

(ii) switching characteristics of a Fast Recovery diode in brief.

**(b)** Discuss an application of PUT. **04**

**OR**

**Q.3 (a)** Draw equivalent circuit of P-N junction diode. Explain, also the reverse characteristics of the same. Is parallel operation of P-N junction diode is possible? **07**

**(b)** Explain V-I Characteristics Of UJT. **07**

**Q.4 (a)** Discuss an application of a (i) TRIAC and (ii) ASCR. **10**

**(b)** Discuss the following requirements of any one power device: **04**

(i) Cooling and (ii) Mounting.

**OR**

**Q.4 (a)** Describe working of a (i) LASCR and (ii) Power Integrated Circuit. **10**

**(b)** Explain Construction And Working Principle Of MOSFET. **04**

**Q.5 (a)** Discuss  $dv/dt$  and  $di/dt$  ratings of an SCR. Describe protection of SCR from  $dv/dt$  and  $di/dt$ . **07**

**(b)** Compare IGBT with POWER MOSFET. **07**

**OR**

**Q.5 (a)** Discuss switching characteristic of IGBT. **07**

**(b)** Explain working of E- type Power MOSFET with neat diagram. **07**

\*\*\*\*\*