

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 142402**Date: 31/12/2012****Subject Name: Fundamentals of Power Electronics****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Draw the block diagram of Power Electronics system. Explain the role of each component in detail. **07**

(b) Define followings:- **07**
(1) Power (2) Control (3) Latching current (4) Commutation
(5) Holding current (6) Energy (7) Active device

Q.2 (a) Define Cyclo-converter. Explain 1-Phase Cyclo-converters in detail. **07**

(b) Draw structure, symbol & equivalent circuit of UJT. Also explain typical UJT V-I characteristic. **07**

OR

(b) Draw & explain schematic construction, symbol & V-I characteristic of a DIAC. **07**

Q.3 (a) Explain in detail Class-A Commutation with necessary waveforms. **07**

(b) Define TRIAC. Enlist all triggering modes of TRIAC & explain any one in detail. **07**

OR

Q.3 (a) Explain the principles of operation of SCR with necessary figures. **07**

(b) How the level of light at which the LASCR will trigger can be varied? Draw symbol and V-I characteristic of LASCR. **07**

Q.4 (a) Compare various types of power semiconductor devices in tabular form. **07**

(b) Draw & explain Power circuit and transient response of Fast recovery diode. **07**

OR

Q.4 (a) Explain dv/dt and di/dt protection of SCR. **07**

(b) Compare semi-converter bridge circuit and full-converter bridge circuit with all technical aspects. **07**

Q.5 (a) Enlist & explain the control strategies for operating the switches employed in d.c. choppers. **07**

(b) Classify Inverters. Draw & explain the circuit diagram of series Inverter with necessary waveforms. **07**

OR

Q.5 (a) Discuss the basic principle and working of SMPS with the help of block diagram. Also explain the application of SMPS. **07**

(b) Explain the operation of McMurray Inverter with necessary waveforms. **07**
