

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

Subject Code:170801**Date: 26/11/2013****Subject Name: Power Electronics and Industrial Drives****Time: 10:30 TO 01:00****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) Describe the operation of 1-phase full wave rectifier with R-L load. **07**
(b) Explain Two-Transistor Analogy of SCR in detail. **07**
- Q.2** (a) Draw and explain the structure of IGBT. Also explain principle of operation and I-V Characteristics of IGBT. **07**
(b) Discuss the operation of 3 phase half wave controlled rectifier with R-L load. Also Discuss the effect of free-wheeling diode in detail. **07**
- OR**
- (b) Explain Turn-off mechanism in Thyristor. Explain commutation methods of Thyristors briefly. **07**
- Q.3** (a) Explain 1-phase half bridge inverter with 90 degree mode of conduction. Draw necessary waveforms. **07**
(b) Discuss operation of 3-phase ac to ac converter with star connected resistive load. **07**
- OR**
- (b) Classify power factor improvement methods for phase controlled rectifiers. Explain Any one. **07**
- Q.4** (a) Explain the following PWM methods for control of single phase inverter **07**
• Single pulse width modulation.
• Sinusoidal pulse width modulation.
(b) Briefly discuss the performance characteristics of Induction Motor. **07**
- OR**
- (b) Briefly discuss the excitation angle control method for power factor improvement With neat sketch and necessary waveforms. **07**
- Q.5** (a) Briefly discuss the operation of single phase semi converter d.c. drives. **07**
(b) Discuss about choice of A.C. and D.C. drives in detail. **07**
- OR**
- (b) Explain control mode of DC-DC converter drives. **07**
