

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV • EXAMINATION – SUMMER • 2014

Subject Code: 142402

Date: 25-06-2014

Subject Name: Fundamentals of Power Electronics

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.

- Q.1** (a) Draw the symbol and characteristics of MCT, Triac, LASCR and SIT. **06**
 (b) Explain the principle of operation of single-phase half-bridge and full-bridge inverter with necessary circuit and waveforms. **08**
- Q.2** (a) Explain the voltage commutated chopper with necessary circuit and waveforms. **07**
 (b) Explain with necessary circuit and waveforms the working of single-phase half-wave controlled rectifier with R load. **07**
- OR**
- (b) Explain with necessary circuit and waveforms the working of single-phase half-wave controlled rectifier with RL load. **07**
- Q.3** (a) Explain the principle of Integral Cycle Control. **07**
 (b) Explain the di/dt and dv/dt protection of thyristor. **07**
- OR**
- Q.3** (a) With the help of circuit diagram and waveforms explain the principle of phase control for single-phase full-wave ac voltage controller with R load. **07**
 (b) Explain the overvoltage protection of thyristor. **07**
- Q.4** (a) Explain the construction and characteristics of power BJT. **07**
 (b) List and explain the turn-on methods of SCR. **07**
- OR**
- Q.4** (a) Explain the construction and working of IGBT. **07**
 (b) Explain the two transistor model of SCR. **07**
- Q.5** (a) Explain the construction and characteristics of UJT. **07**
 (b) Draw the block diagram of power electronics system and explain each block in brief. **07**
- OR**
- Q.5** (a) Explain the construction and characteristics of PUT. **07**
 (b) List the characteristics of an ideal switch. **07**
