

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem. - V - Examination – June- 2011

Subject code: 151703**Subject Name: Electronics in Industries****Date: 27/06/2011****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) Give the classification of power diodes. Explain fast recovery diode with its transient response. **07**
- (b) What are the different methods to turn off the SCR? Explain any two of them. **07**
- Q.2** (a) Draw and explain the waveform of half-wave uncontrolled rectifier with RL load. Derive its average load voltage equation and explain effect of flywheel diode. **07**
- (b) Give the difference between power MOSFET and power BJT. Explain depletion type MOSFET with output and transfer characteristics. **07**
- OR**
- (b) Explain two transistor analogue of the SCR. **07**
- Q.3** (a) Draw and explain six-phase half-wave uncontrolled rectifier. Derive the transformer utility factor of it. **07**
- (b) Explain construction and working of Shockley diode and four layer diac. **07**
- OR**
- Q.3** (a) A sinewave of peak amplitude 25V at frequency 50 Hz applied to a half-wave uncontrolled rectifier with $R=1000$ ohm and the forward resistance of diode is 10 ohm. Calculate DC output power, rectifier efficiency and ripple factor. If the inductance of 5 H connected in series with R than calculate the output dc voltage. **07**
- (b) Explain basic structure of the benistor and static characteristics of IGBT. **07**
- Q.4** (a) Explain PUT and SUS with its V-I characteristics. **07**
- (b) Draw and explain the waveforms of half-wave controlled rectifier with RL load. Derive the form factor for it. **07**
- OR**
- Q.4** (a) Explain half-wave controlled bridge rectifier for RL load with waveforms. What are the advantages of using flywheel diode? **07**
- (b) Draw the UJT firing circuit for SCR and explain its working with necessary waveforms. **07**
- Q.5** (a) Explain voltage and Jones commutation circuits. **07**
- (b) Draw and explain the 3-phase half-wave controlled rectifier for R load. Derive the equation of form factor for it. **07**
- OR**
- Q.5** (a) Explain the over voltage and gate protection provided for SCR. **07**
- (b) Explain dual converter with its advantages and disadvantages. **07**
