

**GUJARAT TECHNOLOGICAL UNIVERSITY****PDDC - SEMESTER-IV • EXAMINATION – WINTER 2013****Subject Code: X40902****Date: 05-12-2013****Subject Name: Power Electronics – I****Time: 02.30 pm - 05.00 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) Explain V - I characteristics of SCR with necessary diagram. **07**  
(b) Draw UJT symbol. Write a short note on UJT as a relaxation oscillator with necessary diagram. **07**
- Q.2** (a) Write a short note on IGBT. **07**  
(b) Explain series operation of SCR with suitable diagrams. **07**
- OR**
- (b) Explain parallel operation of SCR with suitable diagrams. **07**
- Q.3** (a) Draw and explain 1-phase full wave controlled rectifier for R-L load. **07**  
(b) Write a short note on single phase dual converter with necessary waveforms. **07**
- OR**
- Q.3** (a) Draw and explain 3-phase full wave controlled rectifier with R-L load. **07**  
(b) Enlist power factor improvement techniques. Explain any one method. **07**
- Q.4** (a) Write a short note on Jones' chopper with necessary waveforms. **07**  
(b) Write a short note on Morgan's chopper with necessary waveforms. **07**
- OR**
- Q.4** (a) Explain basic principle of step down chopper. **07**  
(b) Write a short note multiphase chopper. **07**
- Q.5** (a) Write a short note on Single phase full wave DC drives. **07**  
(b) Write a short note on phase locked loop for DC drives. **07**
- OR**
- Q.5** (a) Write a short note on Regenerative braking with necessary sketches. **07**  
(b) Write a short note on four quadrant DC drives. **07**

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