

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-IV • EXAMINATION – WINTER • 2014**

**Subject Code: X40902****Date: 29-12-2014****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 difference between line commutation and forced commutation. Discuss complementary commutation technique in detailed. **07**
- (b) Discuss pulse transformer and its usage in triggering circuit. **07**
- Q.2** (a) Discuss circulating current and non circulating current mode of single phase dual converter. **07**
- (b) Mention different types of protection required for thyristor. Discuss electronic crowbar protection. **07**
- OR**
- (b) Discuss unequal voltage distribution for two series connected SCRs during turn on and turn off. **07**
- Q.3** (a) Explain operation of single phase semi converter with freewheeling diode. **07**
- (b) Explain difference between SCR and IGBT. Discuss Construction of IGBT. **07**
- OR**
- Q.3** (a) What do you mean by unidirectional and bidirectional power devices? Explain Triac in detailed. **07**
- (b) Explain operation of single phase full converter with R-L-E load. **07**
- Q.4** (a) Explain phase locked loop control of DC drive. **07**
- (b) Explain operation of cuk converter. **07**
- OR**
- Q.4** (a) Explain snubber circuit with schematic diagram. Why is it required? **07**
- (b) Define duty cycle. Explain operation of step up chopper. **07**
- Q.5** (a) Explain four quadrant operation of DC drive. **07**
- (b) Explain micro computer based dc drive. **07**
- OR**
- Q.5** (a) Explain time ratio control and current limit control. **07**
- (b) Compare rehostatic and regenerative break control. **07**

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