

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VI • EXAMINATION – WINTER 2013**

**Subject Code: 162405****Date: 04-12-2013****Subject Name: Power Processing circuit -I****Time: 02:30 pm to 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.
4. Notations/ symbols used have usual meanings.

- Q.1** (a) Give detailed classification of rectifiers. Explain the concept of phase-angle control. **07**  
 (b) Explain full-bridge converter with necessary circuit diagram and waveforms. **07**

- Q.2** (a) Discuss any one three terminal IC based linear regulator. **07**  
 (b) Describe the modeling of a controlled rectifier. **07**

**OR**

- (b) A half wave rectifier circuit using an SCR is adjusted to have a gate current of 2mA. The forward breakdown voltage of SCR is 150V for  $I_g = 2\text{mA}$ . When a sinusoidal voltage of 300V peak is applied; determine (i) conduction angle (ii) output power for a load resistance of  $150\Omega$ . Also, draw the rectifier circuit. **07**

- Q.3** (a) Describe voltage mode control of power supply. State its merits. **07**  
 (b) Describe the working principle Class- A type DC chopper. **07**

**OR**

- Q.3** (a) Discuss the utility of input and output filter for a linear regulated power supply. **07**  
 (b) Explain Morgan's chopper with necessary circuit diagram and waveforms. **07**

- Q.4** (a) Discuss working of a boost converter. State its applications. **07**  
 (b) Write short note on: - Fly back converter. **07**

**OR**

- Q.4** (a) Describe operation of a Sepic converter. State its advantages. **07**  
 (b) Write short note on: - Push- pull converter. **07**

- Q.5** (a) Explain the basic concept of resonant switch converter circuit. **04**  
 (b) Explain 3- $\phi$ , phase controlled rectifier with inductive load using necessary waveforms for  $\alpha = 45^\circ$ . **10**

**OR**

- Q.5** (a) Compare: ZVS and ZCS. **04**  
 (b) Explain voltage commutated chopper with neat circuit diagram and waveforms. **10**

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