

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3152407****Date:27/01/2021****Subject Name:Power Electronics Circuits - I****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Give the classification of Uncontrolled rectifier. **03**  
(b) Explain the programmable UJT as an oscillator for SCR triggering. **04**  
(c) Explain the working of 1- $\phi$  full wave Uncontrolled Rectifier with R load. Draw necessary waveforms. **07**
- Q.2** (a) What is a chopper? List the application of chopper. **03**  
(b) Discuss importance and requirement of DC power supply. **04**  
(c) Draw necessary waveforms and explain working of single phase full controlled rectifier circuit with RL load. **07**
- Q.3** (a) Discuss Dual Converter in brief. **03**  
(b) Discuss Star-Delta transformer connection used in multi-pulse Rectifier. **04**  
(c) Explain the working of 3- $\phi$  Uncontrolled Rectifier with RL load. Draw necessary figure and waveforms. **07**
- Q.4** (a) Discuss the significance of freewheeling diode in brief. **03**  
(b) Discuss about the effect of source and load inductance for ac to dc converter. **04**  
(c) Explain the working of 3- $\phi$  controlled Rectifier with R load. Draw necessary figure and waveforms. **07**
- Q.5** (a) Explain the basic principle of DC Chopper. **03**  
(b) Discuss second quadrant chopper with necessary diagrams. **04**  
(c) Explain the TRC & CLC control strategies for the control of chopper. **07**
- Q.6** (a) Discuss Type E chopper with circuit diagram. **03**  
(b) Differentiate voltage and current commutated choppers. **04**  
(c) Explain working principle of Jones Chopper with necessary waveforms. **07**
- Q.7** (a) Discuss SEPIC converter in brief. **03**  
(b) Discuss the principle of operation of Resonant converters. **04**  
(c) Explain the Buck-Boost converter with necessary waveforms. **07**
- Q.8** (a) Classify isolated dc-dc converters. State the advantages of Isolated DC-DC Converters. **03**  
(b) Discuss Push Pull type isolated DC-DC converter. **04**  
(c) Discuss ZVS in details with necessary waveforms. **07**

\*\*\*\*\*