

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- V(OLD) EXAMINATION – SUMMER 2019

Subject Code: 150903

Date: 31/05/2019

Subject Name: Power Electronics - 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.

- Q.1 (a) Describe the switching on characteristics of SCR with a neat diagram. 07
- (b) Discuss the problems and remedies for parallel connection of SCR. 07

- Q.2 (a) Describe the working of UJT Relaxation Oscillator circuit. 07
- (b) Explain Class - B commutation method with necessary diagrams. 07

OR

- (b) Discuss the effect of source inductance on the average output voltage of a single phase full converter. 07

- Q.3 (a) Explain working of single phase full wave converter using SCRs connected to RL load with free wheeling diode. Draw necessary waveforms. 07
- (b) Discuss the single phase dual converter with regard to principle of operation and application. 07

OR

- Q.3 (a) Discuss the construction and operation of IGBT. 07
- (b) Describe triggering of TRIAC using DIAC. 07

- Q.4 (a) Draw the circuit configuration of step down chopper and explain its working. Derive its output voltage equation. 07
- (b) Draw the circuit diagram and explain the working of Morgan's chopper. 07

OR

- Q.4 (a) Explain the classification of chopper circuits based on principle of operation, construction etc. 07
- (b) Write a short note on CUK converter. 07
- Q.5 (a) Explain constant HP constant Torque method of speed control of motor. 07
- (b) List different methods of braking dc motor. Describe regenerative braking scheme. 07

OR

- Q.5 (a) Explain single phase dual converter drive for dc motor. 07
- (b) Discuss the principle of phase lock loop control of d.c drives. List the advantages of phase lock loop control of d.c drives. 07
