

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (Old) EXAMINATION – WINTER 2019****Subject Code: 171002****Date: 26/11/2019****Subject Name: Power Electronics****Time: 10:30 AM TO 01:00 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 the Thyristor dynamic characteristic. **07**
- (b) Explain R and RC trigger circuits for SCR with suitable waveform. **07**
- Q.2** (a) Discuss the two transistor model of a Thyristor and also derive the expression for the anode current. **07**
- (b) Explain the operation of GTO with relevant diagram. **07**
- OR**
- (b) Explain the series parallel operation of thyristor. **07**
- Q.3** (a) What is chopper? Describe the working of Type A chopper. **07**
- (b) What is commutation? Explain with relevant waveforms class B commutation. **07**
- OR**
- Q.3** (a) Describe the construction and working of IGBT. Also enumerate the advantages of IGBT over BJT and MOSFET **07**
- (b) Explain Single phase Full (Bridge) controlled rectifier with resistive load in detail. **07**
- Q.4** (a) Describe the working of single phase half Bridge inverter. What is its main drawback? Explain how this drawback is overcome? **07**
- (b) Describe the operation of three-phase inverter with 180-Degree conduction **07**
- OR**
- Q.4** (a) Describe the operation of single phase half wave controlled rectifier using SCR for RL load and RL load with freewheeling diode. **07**
- (b) What is the principle of operation of step-up chopper? Explain with wave form. **07**
- Q.5** (a) What are the causes of overvoltage and overcurrent? Describe the method used for overvoltage protection of SCR. **07**
- (b) Describe Switched mode power supply with necessary diagrams in detail **07**
- OR**
- Q.5** (a) What is forced commutation? With help of circuit diagram and necessary waveform. Explain the auxiliary (Class D) commutation. **07**
- (b) List out turn on and turn off methods for thyristor. **07**
