

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (OLD) EXAMINATION – WINTER 2018****Subject Code:150903****Date: 16/11/2018****Subject Name: Power Electronics - I****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 construction & working of a SCR. Discuss two transistor analogy. **07**
(b) Explain the characteristic ,working and construction of IGBT. **07**
- Q.2** (a) Explain DIAC with its construction and V-I characteristic. **07**
(b) Explain pulse transformer and opto-coupler. **07**
- OR**
- (b) Write a short note on the current ratings and voltage ratings of thyristor. **07**
- Q.3** (a) Explain the resistance triggering and R-C triggering method. What is advantage of RC triggering over resistance triggering? **07**
(b) Explain the turn-on and turn-off characteristics of an SCR. **07**
- OR**
- Q.3** (a) With neat circuit diagram & waveform explain UJT oscillator triggering. **07**
(b) Write a short note on buck-boost converter. **07**
- Q.4** (a) What is chopper? Explain step-up chopper. **07**
(b) With a neat circuit diagram and waveforms describe the Morgan's Chopper circuit. State its applications & limitations. **07**
- OR**
- Q.4** (a) Describe the working principle of Jones chopper with neat circuit diagram. **07**
(b) Explain in brief various control strategies of a chopper. **07**
- Q.5** (a) Discuss four quadrant operations of DC drives. **07**
(b) Explain phase locked loop (PLL) control of dc motor. **07**
- OR**
- Q.5** (a) Explain how regenerative braking can be achieved for a separately excited DC motor using DC-DC converter. **07**
(b) With neat circuit diagram and waveforms, explain the operation of a two-quadrant chopper capable to give forward motoring and forward regenerative operation. **07**
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