

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER - VII • EXAMINATION - WINTER 2017****Subject Code:170801****Date:18-11-2017****Subject Name: Power Electronics & Industrial Drives****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) Describe the operation of full wave uncontrolled rectifier with R-L load with neat sketch and necessary waveforms. **07**
- (b) Draw and explain the structure of power MOSFET. Also explain the principal of operation and I-V characteristics of power MOSFET. **07**
- Q.2** (a) Explain with neat sketch the 1- Φ full wave controlled rectifier with R-L load using its waveforms and equations. **07**
- (b) With neat sketch, explain two-transistor analogy of SCR in detail. **07**
- OR**
- (b) Draw and explain 3- Φ half wave controlled rectifier with required waveforms and equations. **07**
- Q.3** (a) List the power factors improvement methods for phase controlled rectifiers and explain any one in detail. **07**
- (b) Discuss 3- Φ AC to AC converter with star connected resistive load. **07**
- OR**
- Q.3** (a) Explain with neat sketch the operation of 1- Φ cycloconverter with necessary waveforms. **07**
- (b) Explain the voltage protection by selenium diode and metal oxide varistors in detail. **07**
- Q.4** (a) Discuss the operation of current source inverter with necessary waveforms. **07**
- (b) Explain the following PWM methods for control of 1- Φ inverter. **07**
- Single Pulse Width Modulation
 - Sinusoidal Pulse Width Modulation
- OR**
- Q.4** (a) Briefly discuss the operation of 3- Φ inverter for 120⁰ mode of conduction. Draw necessary waveforms. **07**
- (b) Discuss the role of Snubber Circuit from protection aspect. **07**
- Q.5** (a) What is DC drive? Discuss the basic characteristics of DC Motors. **07**
- (b) Explain V/f control of Induction Motor Drives with its merits and demerits. **07**
- OR**
- Q.5** (a) Briefly discuss the performance characteristics of Induction Motor. **07**
- (b) Discuss about the choice of A.C. & D.C. drives in detail. **07**
