

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 142402****Date: 02-01-2015****Subject Name: Fundamentals of Power Electronics****Time: 02:30 pm - 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) Define Power Electronics. Draw detailed static Anode-Cathode characteristic of a thyristor and Explain it. **07**
- (b) Draw & Explain the schematic diagram, symbol and V-I characteristic of LASCR. **07**
- Q.2** (a) Write a detail note on:- TURN ON methods of SCR. **07**
- (b) Describe the construction and working of SCR using two transistors Analogy. **07**
- OR**
- (b) Explain UJT characteristics. How UJT works as relaxation oscillator? **07**
- Q.3** (a) Define DIAC. Draw & Explain schematic diagram, symbol and V-I characteristic of DIAC. **07**
- (b) Draw & Explain equivalent circuit and transient response of Fast Recovery diode. **07**
- OR**
- Q.3** (a) Enlist all triggering modes of TRIAC. Explain most sensitive mode. **07**
- (b) Draw Schematic diagram and symbol of IGBT. Explain in detail the operation of IGBT. **07**
- Q.4** (a) Explain dv/dt and di/dt protection of SCR. **07**
- (b) What do you mean by cycloconverter? Explain 1-phase cycloconverter in detail. **07**
- OR**
- Q.4** (a) Compare 1-phase & 3-phase uncontrolled rectifier. **07**
- (b) Write a detailed note on: - Power switch classification. **07**
- Q.5** (a) Define Chopper. Enlist and Explain the control strategies employed in DC chopper for operating the switches. **07**
- (b) Define & Classify Invertes. Draw & Explain the schematic diagram of basic series inverter. **07**
- OR**
- Q.5** (a) Explain Principles of operation of STEP-UP/DOWN Chopper and derive equation for output voltage. **07**
- (b) Draw & Explain single phase MC-MURRAY Inverter circuit with voltage and current waveforms. **07**
