

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- IVth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 142402****Date: 31/05/2012****Subject Name: Fundamentals of Power Electronics****Time: 10:30 am – 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) Draw the Block Diagram of Power Electronics System and Explain requirement of power processing in detail. **07**
- (b) Draw and explain the construction of Planner diffused SCR. Explain V-I Characteristics of SCR. **07**
- Q.2** (a) Draw and explain the construction of TRIAC. Explain the Four Mode Operation of TRIAC. **07**
- (b) Compare: 1. Active and Passive Component 2. Ultra Fast Recovery Diode and PIN Diode **07**
- OR**
- (b) Compare: 1. DIAC and TRIAC 2. Converter Grade and Inverter Grade Thyristor. **07**
- Q.3** (a) Define Turn OFF time. List the methods of commutation. Explain Class B commutation along with circuit diagram and necessary waveforms. **07**
- (b) Discuss causes and effect of over voltage and over current problem in Thyristor and Explain its remedies. **07**
- OR**
- Q.3** (a) Define Turn ON time. List the methods of Triggering. Explain the UJT Firing along with necessary circuit and waveforms. **07**
- (b) List the characteristics of ideal switch and explain classification of Power Switch. **07**
- Q.4** (a) Define Rectification. Explain working of 1- Ø Controlled Full Wave Rectifier along with neat circuit diagram and waveform. **07**
- (b) What is inverter? Explain Classification of inverter in details. Explain the working of Full Bridge inverter along with neat circuit diagram and waveform. **07**
- OR**
- Q.4** (a) Define Chopper. Explain Classification of Chopper. Explain working of step up chopper using circuit diagram and neat waveform. **07**
- (b) What is AC voltage Regulator? Explain principle, working and application of Integral Cycle Control AC voltage Regulator. **07**
- Q.5** (a) Write a Technical Short Note on Power Integrated Circuit. **07**
- (b) Explain the circuit diagram and working of voltage commutated chopper. **07**
- OR**
- Q.5** (a) Write a Technical Short Note on SMPS. **07**
- (b) Explain the circuit diagram and working of CSI. **07**
