

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-IV Examination-Nov/Dec-2011

Subject code: 142402

Date: 02/12/2011

Subject Name: Fundamental of power Electronics

Time: 02.30 pm -5.00 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 overview of building block of PES. **07**
- (b) Draw and explain the construction of SCR. Explain V-I Characteristics of SCR. **07**
- Q.2** (a) Draw symbols and V-I characteristics of (a) Diode (b) MCT (c) Power BJT (d) GTO (e) LASCR (f) Power MOSFET (g) IGBT **07**
- (b) Compare the following term: 1. UJT and PUT 2. Fast Recovery Diode and Schottky Diode **07**
- OR**
- (b) Compare the following term: 1. DIAC and TRIAC 2. SIT and SITH **07**
- Q.3** (a) Define commutation. List the method of commutation. Explain Class A commutation along with circuit diagram and necessary waveforms. **07**
- (b) Discuss causes and effect of di/dt and dv/dt problem for Thyristor and Explain its remedies. **07**
- OR**
- Q.3** (a) Define Turn ON time. List the method of Triggering. Explain the R-C triggering along with necessary circuit and waveforms. **07**
- (b) Enumerate Characteristics of ideal switch and explain each in detail. **07**
- Q.4** (a) Define Rectification. Explain working of 1- Ø Controlled Half Wave Rectifier along with neat circuit diagram and waveform. **07**
- (b) What is inverter? Explain Classification of inverter in details. Explain the working of Half Bridge inverter along with neat circuit diagram and waveform. **07**
- OR**
- Q. 4** (a) Define Chopper. Explain Classification of Chopper. Explain working of buck chopper using circuit diagram and neat waveform. **07**
- (b) What is AC voltage Regulator? Explain principle, working and application of AC voltage Regulator. **07**
- Q.5** (a) Write a Technical Short Note on: IGBT **07**
- (b) Define Following terms: 1. Reverse Recovery Time 2. THD 3. DF 4. LOH 5. Duty Cycle 6. Latching Current 7. Holding current **07**
- OR**
- Q.5** (a) Write a Technical Short Note on : Optocoupler **07**
- (b) Define Following terms: 1. Finger Voltage 2. Intrinsic Standoff Ratio 3. Peak inverse Voltage 4. Rectification Efficiency 5. Rise Time 6. Displacement Power Factor 7. Harmonic Factor. **07**
