EG



**D 42504** (Pages : 2) Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION**
**DECEMBER 2007**

EE 04 701—POWER ELECTRONICS

(2004 admissions)

Time : Three Hours Maximum : 100 Marks

## Part A

*Answer* **all** *questions.*

1. Explain the turn on process of a thyristor based on two transistor analogy.
2. Discuss the typical ratings and specifications of a thyristor.
3. Use of freewheeling diode improves the input power factor. How ?
4. Compare half controlled and fully controlled single phase bridge converters.
5. Explain the working of single phase AC regulators with RL load.
6. Discuss the control methods for varying the duty cycle of a chopper.
7. Compare and contrast the different switching regulators.
8. Compare switched mode power supply system.

(8 × 5 = 40 marks)

## Part B

*Answer* **one** *question from each module fully.*

MODULE I

9. Explain the series operation of thyristors. What are the causes for voltage unbalance in series circuits and how this problem is solved.

*Or*

10. Explain the operation of following devices with its characteristics.

(a) GTO. (b) IGBT. (c) TRIAC.

MODULE II

11. With neat circuit diagram and waveforms, explain the operation of a full bridge inverter with R and RL loads.

*Or*

12. With necessary waveform and circuit diagrams, explain the operation of a single phase, fully controlled bridge converter with RL load for a firing angle of (a) 45° and (b) 90°.

**Turn over**

MODULE III

13. Explain the operations of a quadrant d.c. chopper, with circuit diagram and waveforms.

*Or*

14. Explain the working of a single phase cyclo-converter, with circuit diagrams and necessary waveforms.

MODULE IV

15. Explain with circuit diagram and waveforms, the working of buck-boost regulators, in continuous conduction mode and discontinuous conduction mode.

*Or*

16. Explain the principles of operation and working of a switched mode power supply.

(4 × 15 = 60 marks)