

C 5454

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Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2010**

EE 04 701—POWER ELECTRONICS

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer the following.

1. Briefly discuss the parallel operation of SCRs.
2. Compare and contrast between BJT and MOSFET.
3. A highly inductive load, such that load current can be assumed to be constant, is to be supplied from a 230 V, 50 Hz, single phase supply by a fully controlled and a half controlled bridges. Compare the average load voltage provided by each bridge at a firing angle of 30° .
4. Draw and explain a simple series inverter with waveforms.
5. Compare Voltage and current commutated choppers.
6. Explain on-off control and phase control of a.c. voltage regulators.
7. Explain the working of boost regulators.
8. List the characteristics and applications of SMPS.

(8 × 5 = 40 marks)

Part B

9. Explain the static and switching characteristics of a GTO.
- Or*
10. (i) With neat sketch explain the reverse recovery characteristics of a power diode. (8 marks)
 - (ii) Explain the series connection of SCRs. (7 marks)
 11. Explain the operation of a single phase dual converter with circulating current mode. Draw neat waveforms. (15 marks)

Or

12. Explain with necessary circuit diagrams and waveforms, the working of a three phase voltage source inverter for 120° mode of operation. (15 marks)

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13. Draw the schematics of step down and step up chopper and derive an expression for output voltage in terms of duty cycle.

(15 marks)

Or

14. Explain with a neat circuit diagram and waveforms the operation of a 1ϕ to 1ϕ cycloconverter.

(15 marks)

15. Explain the various configurations of SMPS and brief its characteristics.

(15 marks)

Or

16. Draw the circuit of cuk regulator and explain its working principle with necessary waveforms. Derive the expression for peak to peak ripple voltage of the capacitor that is present across the load.

(15 marks)

[4 x 15 = 60 marks]

Part B

9. Explain the static and switching characteristics of a GTO.

Or

10. (i) With neat sketch explain the reverse recovery characteristics of a power diode.

(8 marks)

(ii) Explain the series connection of SCRs.

(7 marks)

11. Explain the operation of a single phase dual converter with circulating current mode. Draw neat waveforms.

(15 marks)

Or

12. Explain with necessary circuit diagrams and waveforms, the working of a three phase voltage source inverter for 120° mode of operation.

(15 marks)

Turn over