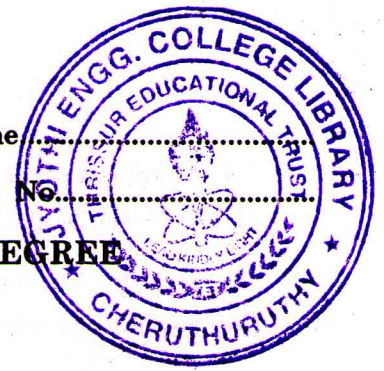


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Name

Reg. No.



**FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2011**

AI 04 505—POWER ELECTRONICS

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

1. (a) Justify : MCT is a GTO with MOS-controlled gate.
(b) What is the purpose of having parallel connection of SCRs ? What care must be taken, when paralleling the SCRs ?
(c) What is the necessity of free wheeling diode in a power converter circuits ?
(d) What is meant by ripple factor ? Explain its significance.
(e) With the neat diagram, explain step up/step down chopper.
(f) List out the difference between CSI and VSI.
(g) Sketch the driver circuit for BJT and explain.
(h) With the block diagram, explain the need of synchronised triggering circuit.

(8 × 5 = 40 marks)
2. (a) With the neat diagram, explain the turn on and turn off characteristics of IGBT. (10 marks)
(b) Compare SCR and TRIAC. (5 marks)

Or

 - (c) Draw and explain the static and dynamic characteristics of TRIAC. (8 marks)
 - (d) Describe the series and parallel operation of SCRs. (7 marks)
3. (a) Draw and explain the 3 ϕ -half controlled rectifier. (10 marks)
(b) Explain any one method of improving power factor in a converter circuit. (5 marks)

Or

 - (c) With the neat sketch and waveform explain the operation of 1-phase AC voltage controller for RL load. (8 marks)
 - (d) With the basic block diagram, explain dual converter circuit. (7 marks)
4. (a) Give the detailed analysis of class D chopper. (8 marks)
(b) Explain in brief the voltage control of three-phase inverter. (7 marks)

Or

Turn over

- (c) Draw and explain the operation of CSI with a neat waveform. (8 marks)
- (d) With the help of voltage and current waveforms explain two quadrant chopper. (7 marks)
5. (a) Describe the operation of any one multistage conversion circuit. (8 marks)
- (b) Explain the microcontroller based triggering circuit for chopper circuit. (7 marks)

Or

- (c) Draw and explain Buck boost regulator circuit. (8 marks)
- (d) With the block diagram, explain the operation of offline UPS. (7 marks)

[4 × 15 = 60 marks]