Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (EE) (Separate Supple)/SEM-7/EE-704A/2011

2011
POWER ELECTRONICS

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Why do we use chopper ?

a) To obtain variable dc voltage from a source of constant dc voltage

b) To obtain variable dc voltage from a source of constant ac voltage

c) To obtain variable ac voltage from a source of constant dc voltage

d) To obtain variable ac voltage from a source of constant ac voltage

ii) Meaning of RCT.

a) Reverse Conducting thyristor

b) Random collection of thyristor

c) Repeated Conduction thyristor

d) Reverse Conducting Transistor

iii) What is the function of inverter ?

a) To get variable ac voltage from dc voltage

b) To get ac voltage from dc voltage

c) To get variable dc voltage from ac voltage

d) To get variable ac voltage from ac voltage

iv) What do you mean by the element SUS ?

a) Silicon Unilateral Switch

b) Silicon Unicorn Switch

c) Silicon Uni Switch

d) Silicon Unifateral Switch.

v) The no of p-n junctions in a thyristor is

a) 1 b) ·2

c) ·3 d) ·4 .

vi) When anode is positive with respect to cathode in an SCR the no of blocked p-n junction is.

a) 1 b) ·2

c) ·3 d) ·4 .

vii) In a thyristor the ratio of latching current to holding is

a) 0·4 b) 1·0

c) 2·5 d) 6·0 .

viii) Static V-I characteristics of an SCR with different gate drives applied to the gate are indicated by

a) Ig2 > Ig1 > Igo b) Vg2 > Vg1 > V go

c) Pg2 > Pg1 > Pg o d) Either (a) or (b).

ix) For an SCR dv/dt protection is achieved through the use of

a) RL in series with SCR

b) RC across SCR

c) L in series with SCR

d) L across SCR.

x) A thyristor can be termed as

a) DC switch b) AC switch

c) Either (a) or (b) d) Square wave switch.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Explain the two transistor analogy of thyristor.
3. How are the choppers classified ? Give diagrams.
4. Write the advantages and disadvantages of TRIAC.
5. Describe the V-I characteristics of SCR
6. How is dv/dt protection done of SCR ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Design the Snubber circuit parameters dv/dt protection of an SCR. Briefly describe the turn-on methods of SCR. What are the problems of parallel connected SCRs & what are the remedies ?
8. Describe the R-C firing circuits with necessary waveforms for turn on of a thyristors. What do you mean by commutation of thyristors ? How many types of commutations are there in use ? Briefly describe the Class-D commutations with necessary waveforms.
9. Write down the differences between SCR, BJT & MOSFET. What is thermal turn on ?
10. How are the inverters classified ? Explain the single phase full-bridge inverter with the operation of Resistive Load along with the circuit analysis.