Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (EE) PT (Sem.–6)

POWER ELECTRONICS

Subject Code : BTEE-504

M.Code : 72789

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a. What is light triggering? Discuss.

b. Draw and explain why snubber circuit is required?

c. Why Germanium is not used for controlled rectification? Explain.

d. What do you mean by power dissipation? Explain.

e. Differentiate between AC and DC choppers.

f. Draw the Symbol and characteristics of UJT.

g. Differentiate between forced and natural commutation.

h. What is an inverter? List different requirements of a good inverter.

i. List the advantages and disadvantages of cycloconverters.

j. Draw the Symbol and characteristics of SUS.

SECTION-B

2. SCR with a rating of 1000V and 200A are available to be used in a string to handle 6kV and lkA. Calculate the number of series and parallel units required in case derating factor is (a) 0.1 and (b) 0.2.

3. Describe the working of a single phase half bridge inverter. What is its main drawback? Explain how this drawback can be taken care off.

4. Explain the operating principle of single phase to single-phase step down cycloconverter with the help of midpoint configuration for discontinuous load current.

5. Discuss with the relevant waveforms, Class F type of commutation employed for thyristor circuits.

6. A single phase full converter is operated from 230V, 50Hz source and the load consists of R=10Ω and a large inductance so as to render the load current constant. For a firing angle delay of 30 degree, determine :

   a. Average output voltage

   b. Average output current

   c. Average and rms values of thyristor currents

   d. Power factor

SECTION-C

7. Describe in detail the current commutated chopper with relevant current and voltage waveforms as a function of time.

8. Draw and explain the static VI characteristics of a thyristor. List the various turn on methods of the thyristor and explain in detail gate triggering and dv/dt triggering.

9. Discuss :

   a. Dual Converter

   b. Reverse Conducting thyristors

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.