

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 1kA. 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 $R=10\Omega$ 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.