Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EE) (Sem.–5)

B.Tech. (Electrical & Electronics Engg)

POWER ELECTRONICS

Subject Code : BTEE-504 M.Code : 70557

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION 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 gate triggering? Discuss.

b) Explain why protection of SCR from over voltage is required?

c) Define latching and holding current.

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

e) Explain the importance of phase angle control.

f) Draw the Symbol and characteristics of LASCR.

g) Differentiate between forced and natural commutation.

h) Explain the operating principle of a Inverter.

i) Write down the advantages and disadvantages of cycloconverters.

j) What do you mean by voltage commutated chopper? Explain.

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SECTION-B

2. Draw and explain the VI characteristics of a SCR.

3. Describe the working of four quadrant chopper with relevant circuit diagrams and its operation in all the four quadrants.

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 D type of commutation employed for thyristor circuits.

6. A single phase 230V, 1kW heater is connected across l-phase, 230V, 50Hz supply through a SCR. For the firing angle delays of 45 degree and 90 degree, Calculate the power absorbed in the heater element. Also comment upon the result obtained.

SECTION-C

7. Describe in detail modified McMurray half bridge inverter with appropriate voltage and current waveforms. Explain its operation by dividing the total commutation interval into certain well defined modes.

8. Discuss the various Firing circuits of SCR along with their waveforms.

9. Discuss :

   a) Two quadrant chopper

   b) Dual converter

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