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

Total No. of Questions : 09

B.Tech.(EE)/(Electrical & Electronics)/(Electronics & Electrical)
(2011 Onwards)

(Electrical Engineering & Industrial Control) (2012 Onwards) (Sem.–5)

POWER ELECTRONICS

Subject Code : BTEE-504

Paper ID : [A2110]

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. Define Holding and Latching currents.

b. Explain the need of snubber circuit.

c. List the advantages of gate triggering.

d. What is line commutation? Explain.

e. Explain current limit control *w.r.t.* choppers.

f. What are the main types of DC choppers? Which of these is more commonly employed and why?

g. List the advantages of cycloconverter.

h. Compare voltage and current source inverters.

i. Draw the Symbol and characteristics of SCS.

j. List the different requirements of a good inverter.

SECTION-B

2. Explain in detail the transient characteristics of SCR. Support your answer with the relevant diagrams.

3. Discuss impulse commutation (Class D) technique employed for thyristor circuits. Support your answer with the relevant waveforms, if any.

4. What do you mean by Dual converter? Why is it required? Explain the working of an ideal dual converter.

5. Explain (in detail) the principle and working of a single-phase full bridge inverter.

6. Explain the operating principle of single phase to single-phase step up cycloconverter with the help of bridge type configuration.

SECTION-C

7. Explain in detail the operation of voltage commutated chopper, by dividing into certain well-defined modes. Support your answer with relevant voltage and current waveforms as a function of time.

8. a) Explain the methods adopted for protection of SCRs against overvoltage.

   b) Explain the principle of single-phase half wave phase controlled rectifier. Draw the waveforms when resistive load is connected.

9. Discuss the following in detail :

   a) Load Commutation.

   b) Reduction of harmonics in the inverter output voltage by PWM method.