

B.TECH SEM - VI (2007 COURSE) (E & TC ENGG.) :
WINTER - 2017

SUBJECT : POWER ELECTRONICS DEVICES & APPLICATIONS

Day : **Thursday**
Date : **23/11/2017**

Time : **10.00 AM TO 01.00 PM**
Max. Marks : **80**

W-2017-2541

N.B.:

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Assume suitable data if necessary.

SECTION - I

- Q.1** a) How doping level affects performance of a thyristor or SCR, explain? [05]
b) Explain thyristor commutation techniques. [05]
c) How are inverters classified? [04]
- Q.2** a) Draw the switching model of MOSFET and explain switching characteristics. [07]
b) Discuss various protection methods used for SCR against high dv/dt and di/dt . [06]
- Q.3** a) What is 3-phase full wave rectifier? Explain the operation and draw the load voltage waveforms when firing angle $\alpha = 0^0$ and $\alpha = 30^0$, assuming resistive load. State assumptions made. [07]
b) What do you mean by the requirement of reactive power for a converter? Why at all it is required, even for a purely resistive load? [06]
- Q.4** a) Explain the various performances parameters of an inverter. [06]
b) With the help of circuit diagram and relevant waveform explain operation of full bridge inverter for an inductive load. [07]

SECTION - II

- Q.5** a) Explain the need of resonant converter. [05]
b) Explain principle of integral cycle control. [05]
c) Write down characteristics of fluorescent lamp. [04]
- Q.6** a) Explain the principle of DC chopper circuit. What purpose do that serve? [07]
b) What are merits and demerits of buck-boost converter? [06]
- Q.7** a) With the help of block diagram explain triggering scheme for inverter. [06]
b) Write short note on microprocessor based triggering scheme for single phase converter. [07]
- Q.8** a) Explain types of HVDC system with its configuration. [07]
b) Draw block diagram of UPS. Explain it. [06]

* * * *