B.Tech Sem – V (2007 Course) (Electrical Engg.) : WINTER - 2018

SUBJECT: POWER ELECTRONICS

Day : Saturday
Date : 24/11/2018

Time : 02.30 PM TO 05.30 PM
Max. Marks : 80

W-2018-2803

N.B.:

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

SECTION – I

Q. 1 **a)** Draw the Gate characteristics of SCR and explain it. **(05)**

b) Derive the expression for all external performance measures of 6 pulse converter. **(04)**

c) Explain the term breakdown voltage in DIAC. **(04)**

Q.2 **a)** Draw the turn-off characteristics of SCR and explain the turn off mechanism. **(07)**

b) What are the different signals that can be used for turn on SCR by Gate control? Compare them. **(06)**

Q.3 **a)** List the various techniques of improving power factor in phase controlled converter. **(06)**

b) Explain in detail the sinusoidal PWM control scheme for power factor improvement. **(07)**

Q.4 **a)** Explain why the DIAC- TRIAC matched pair should be used in a control circuit. **(07)**

b) Draw and explain the VI characteristics of TRIAC and explain its working. **(06)**

SECTION – II

Q.5 **a)** Draw and comment on VI characteristics of MCT. **(05)**

b) Draw the schematic diagram of a single phase AC chopper and discuss in brief the output voltage and current waveform. **(04)**

c) Explain in brief the difference between tripolar and unipolar PWM inverter. **(04)**

Q.6 **a)** Explain the effect of temperature on the operation of MCT. **(06)**

b) With the help of neat sketch explain the operation of MOS- controlled thyristor **(07)**

Q.7 **a)** Draw and explain the working of current commutated copper. Also draw the associated waveform **(07)**

b) Describe the voltage commutated chopper with associated voltage and current waveform **(06)**

Q.8 **a)** Explain the function of feedback diode used in anti parallel with transistor in inverter. **(07)**

b) Explain the cross-conduction of shoot through fault in inverter. How to overcome it? **(06)**

* * * *