PVP 14

Code: EE5T4

III B.Tech - I Semester – Regular/ Supplementary Examinations
October 2017

POWER ELECTRONICS
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Draw practical and ideal V-I characteristics of DIAC.
b) Define latching current.
c) How is output ripple frequency related to supply frequency?
d) What is form factor?
e) What is commutation in inverters?
f) What is the function of snubber circuit?
g) What is minimum gate pulse requirement? And what is it related to?
h) What is circuit turn off time?
i) What are the different losses that occur in thyristor while operating?
j) What is meant by critical inductance in choppers?
k) What are advantages of series inverters?

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

2.a) Explain class – D commutation technique in SCR with waveforms. 8 M

b) Design a static and dynamic equalizing networks for series and parallel connection of SCR'S. 8 M

3. A 3- phase fully controlled bridge converter with 415V supply, 0.04 ohm resistance - per phase and 0.25ohm reactance per phase is operating in the inverting mode at a firing angle of 135 degrees. Calculate the RMS voltage when the current is 80A. The thyristor voltage drop is 1.5V. 16 M

4. Explain the operation of three phase voltage source inverter for 120 degrees mode of conduction with waveform and derive the expression for output voltage. 16 M

5.a) Explain the operation of step down cycloconverter with RL Load & neat waveforms. 8 M

b) Explain the operation of AC voltage controller with RL load. 8 M

6. A chopper is feeding an RL load as shown in Figure with Vs = 220V, R = 5Ω, L=7.5mH, f = 1kHz, k = 0.5, and E = 0 V. 16 M

Calculate

(i) The minimum instantaneous load current

(ii) The peak instantaneous load current

(iii) The maximum peak-to-peak load ripple current

(iv) The average value of load current.