Total No. of Questions : 10]

SEAT No. :

P1710

[Total No. of Pages : 2

[5058]-343
T.E. (Electrical)
POWER ELECTRONICS
(2012 Course) (Semester - I)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***

Q1) a) Describe working of single phase bridge converter with R load Draw waveforms of load voltage, load current. **[5]**

b) How ac voltage regulators are classified? Explain single phase ac regulator feeding inductive load. Draw output voltage waveform. **[5]**

OR

Q2) a) Draw & Explain Gate Characteristic of SCR. **[5]**

b) Explain the following ratings of the thyristor. **[5]**

i) Latching current

ii) Holding current

Q3) a) Explain working of three phase full converter with a firing angle of 30^{o} & obtain expression for phase voltage & Line voltage. **[5]**

b) State and explain the effect of source inductance on operation of converter. **[5]**

OR

Q4) a) Draw and explain single phase semi converter with output waveforms with RL load. **[5]**

b) Explain R-C triggering circuit of Thyristor. **[5]**

Q5) a) Explain Class E chopper feeding RLE load in detail. **[8]**

b) Describe the basic structure of MCT. Give its equivalent circuit and explain the turn on and turn off process. **[8]**

OR

P.T.O.

Q6) a) What is time ratio control in dc choppers? Explain the use of TRC for controlling the output voltage in choppers. **[8]**

b) For Type A chopper the supply voltage is 230V, load resistance being 10Ω for the duty cycle of 40%. Find the average and rms values of the output voltage and chopper efficiency by taking voltage drop of 2V across the chopper during ON condition. **[8]**

Q7) a) Explain with circuit diagram and waveforms operation of single phase current source inverter. **[8]**

b) Explain Sinusoidal Pulse width modulation with necessary waveforms. **[8]**

OR

Q8) a) Explain with circuit diagram and waveforms operation of single phase current source inverter. **[8]**

b) Derive expression for output voltage in single pulse Modulation by Fourier analysis. **[8]**

Q9) a) Explain working of three phase six step voltage source inverter in 120^{o} mode of operation. For star connected load draw output voltage waveforms. Show devices conducting in each step. **[10]**

b) Compare Multilevel inverter and Multi Pulse Inverter. **[8]**

OR

Q10)a) Draw neat diagram and explain cascaded multilevel inverter. **[8]**

b) Explain working of three phase six step voltage source inverter in 180^{o} mode of operation. For star connected load draw output voltage waveforms. Show devices conducting in each step. **[10]**