Seat
No.

T.E. (Electrical)(Semester – I) Examination, 2014
POWER ELECTRONICS
(2012 Course)

Time : 3 Hours
Max. Marks : 70

1. a) For SCR, account for switching losses and effect of switching frequency on power loss.
   5
   b) Explain 'dynamic chara' of SCR. **5**

                  OR

2. a) Explain single phase dual converter with circulating current mode. **5**
   b) Explain single phase ac regulator feeding RL load. Draw output voltage waveform. **5**

3. a) Compare output voltages available from 1ph and 3 ph. fully controlled bridge rectifiers based on magnitude, ripple content and ripple frequency. **5**
   b) Explain use of diode as FWD and feedback diode for inductive loads. **5**

                  OR

4. a) Draw and explain gate chara of SCR. **5**
   b) Explain 3 ph. semicontrolled rectifier feeding RL load. Write output voltage expression. **5**

5. a) Explain Type C chopper operation with circuit diagram and waveforms. **8**
   b) Compare MOSFET, IGBT and power transistor with neat symbols and SOAs **8**

                  OR

6. a) Draw VI chara of MCT and explain operation. **8**

   b) For a chopper feeding inductive load with R = $4\,\Omega$ & L = 6 mH from 200 V source at 50% duty and 1kH$_2$ switching frequency, find
      i) Maxi and Mini load current
      ii) Peak to Peak ripple current
      iii) Av. voltage and Av. load current.

7. a) Explain working of 1ph bridge inverter feeding RL load. Draw voltage and current waveforms and comment on need for feedback diodes. **8**
   b) Explain multiple pulse width Modulation Technique for Inverter control. Explain modulation indices and effect on harmonic control. **8**

                  OR

8. a) Explain why quasi square output voltage has better performance than square wave output. How 1ph. inverter bridge can be operated to give quasi square output ? **8**
   b) Explain sinusoidal PWM technique for inverters. How voltage and freq. control is achieved ? **8**

P.T.O.

9. a) Draw 3 ph inverter bridge to feed 3 ph resistive load (star connected) using $180°$ mode of conduction. Draw control signals for devices used and output phase and line voltage. **10**

   b) Compare CSI and USI based on working and advantages. **8**

                          OR

10. a) What is the need of using multilevel inverters ? Explain one type of multilevel inverter. **10**

    b) Compare and comment on Multipulse and Multilevel inverter output voltages. **8**

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