Library

T.E. (Elect) (Sem. VI) (Rev.)

Power Electronics

31/12/07

VE-Nov 07 29

Con/5530–07. **(REVISED COURSE)** **CD–5523**

(3 Hours) **[Total Marks : 100**

Master

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remainings questions.
(3) Assume **suitable** data wherever **necessary**.

1. (a) Explain the following ratings of SCR – **10**
   (i) i^2t rating
   (ii) di/dt rating
   (iii) Holding and latching current
   (iv) Peak inverse voltage
   (v) dv/dt rating.
   (b) (i) Compare properties of power BJT, MOSFET and IGBT from application point of view. **5**
   (ii) Explain protection methods used for over current, overvoltage, dv/dt and di/dt. **5**

2. (a) Draw a three phase full bridge inverter using SCR and its waveform for 120° conduction and 180° conduction. Explain operation in brief. **10**
   (b) Describe different commutation techniques used in case of SCR. **10**

3. (a) Draw and explain circuit diagram for synchronized UJT triggering with associated waveforms. Also explain necessity for synchronization. **10**
   (b) Explain with the help of neat diagram, construction and operating principle of IGBT. **10**

4. (a) Sketch I-V characteristics of typical TRIAC. Explain it's four quadrant operation and compare it with SCR. **10**
   (b) What are different methods to reduce harmonics in 3ϕ inverter ? Explain briefly. **10**

5. (a) Draw circuit diagram of single phase A.C. regulator for R-L load using phase control. Give waveform of input, output voltage and currents. **10**
   (b) Derive the expressions for RMS value of output voltage and current for the above circuit. **10**

6. (a) Draw circuit diagram of multiple pulse PWM single phase inverter and explain its working with suitable waveforms. Give advantages of PWM Technique. **10**
   (b) Explain basic operation of SCR with suitable circuit diagram. Also write difference between SCR and BJT. **10**

7. (a) Draw the circuit diagram of Jone's chopper and explain its working in detail with relevant waveforms. **12**
   (b) Compare Morgen chopper with Jone's chopper. **8**

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