

**REVISED COURSE**  
( 3 Hours )

[ Total Marks : 80

N.B.

- 1) Question No-1 is Compulsory.
- 2) Attempt any Three (03) Questions from remaining Five (05) Questions.
- 3) Assume suitable data where ever necessary.

1. Attempt the following Questions (any4)
  - a) Draw the Two Transistor Model Of SCR? State all the currents Equations of  $I_{C1}$ ,  $I_{C2}$  &  $I_A$  5
  - b) Why forced commutation is required in DC to AC converters. 5
  - c) Calculate output voltage for a step down chopper with  $V_{in}=200$  V and Duty Cycle =0.25 5
  - d) What is the Need of freewheeling diode in rectifiers state with example 5
  - e) Explain brief why harmonic Neutralization is necessary in output of inverter. 5
  - f) Define and explain performance parameter of controlled rectifier
2. (a) What do you mean by Commutation of SCR? State the various methods of commutation of SCR, Explain force method in detail. 10
  - (b) What is difference between a cycloconverter and an ac voltage controller, Explain single phase converters with waveforms 10
3. (a) Explain the Basic Structure & static characteristics of IGBT with creation of inversion layer & conductivity modulation 10
  - (b) Draw and Explain Buck-Boost Converter with the help of circuit diagram and waveforms Derive the relation for load voltage. 10
4. (a) A three phase bridge inverter is operated in  $180^\circ$  conduction mode is operating from a 560V DC supply ,Find out the following (I)RMS Value of output line and phase voltage (II)RMS Value of fundamental components of line and phase Voltages 10
  - (b) Explain the Static I-V Characteristics of TRIAC? State Forward and Reverse Characteristics, Compare DIAC- TRIAC. 10
5. (a) Why the protection of SCR in Necessary? State the various protection of SCR, Explain any one method in detail. 10
  - (b) State comparison between control strategies of chopper 1.PWM control 2.Variable Frequency Control 3.Current limit control. A step down chopper feeds a resistive load of 10 ohms from 100V DC supply .Calculate duty cycle required so that power dissipation in load is 100watts 10
6. Write short note on ( any 4 ) : 20
  - (a) Half wave controlled rectifiers with R load with waveforms
  - (b) full bridge inverter with waveforms
  - (c) Cuk regulators
  - (d) Construction & operation of GTO
  - (e) Compare IGBT and Power BJT