

Time: 3 Hours

Marks: 80

Instruction to the candidate if any :-

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.

Q. No.

Marks.

- Q.1 Attempt the following Questions(any4)**
- a) Equivalent circuit and circuit symbol of IGBT **5**
 - b) Compare Self commutation and Class D Commutation. **5**
 - c) What is difference between a cycloconverter and an ac voltage controller **5**
 - d) What are the performance parameters of Inverter ,give effect of crass conduction **5**
 - e) Explain brief step Down /Buck switching Regulator **5**
 - f) Calculate output voltage for a step up chopper with $V_{in} = 200v$ and duty cycle= 0.25. **5**
- Q.2(a)** What are the over current protection SCR? State the crossbar protection circuit of SCR, Explain the metal oxide Varistors **10**
- Q.2(b)** What is difference between a cycloconverter and an ac voltage controller, Explain single phase converters with waveforms **10**
- Q.3(a)** Explain the construction of GTO I-V characteristics of GTO with Advantages of GTO over BJT and SCR & Applications of GTO **10**
- Q.3(b)** Draw and Explain Buck-Boost Converter with the help of circuit diagram and waveforms Derive the relation for load voltage **10**
- Q.4(a)** A SINGLE quadrant DC to DC converter is operated with following specifications 1.ideal battery of 220V 2.ON time $t_{ON} = 2msec$.3.OFF time $t_{OFF} = 1.5msec$. To find 1.Average and RMS out put Voltage 2.RippleFactor and Form Factor **10**
- Q.4(b)** Draw and Explain Structure of power MOSFET? State STATIC & SWITCHING Characteristics, power MOSFET with forward blocking and applications of power MOSFET **10**
- Q.5(a)** Draw and Explain single phase half controlled rectifier with symmetrical configuration with highly inductive Load draw the waveforms **10**
- Q.5(b)** A three phase inverter operated in 180° conduction mode is operating from 470VDC supply find out the following 1.RMS value of output line and phase voltage 2.RMS value of the fundamental components of line and phase voltages **10**
- Q.6** Write short note on: **20**
- (a) Full wave controlled rectifiers with R load with waveforms
 - (b) Three phase full wave converter with waveforms
 - (c) Dual Converter
 - (d) Construction & operation of IGBT