

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.

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| 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 | |