

Time: 3 Hours

Max. Marks: 80

- Q1. Solve any 05 4 marks each**
- Show the turn-on process of SCR using waveform and explain in short.
 - What are the advantages of using PWM rectifier?
 - How the silicon-carbide devices are different than normal silicone devices?
 - Compare VSI and CSI
 - Where the DC-DC converters are used.
 - How Snubber circuit protects semiconductor switches
 - How heat sink is selected?
- Q2. Solve any two out of three 10 marks each**
- Why the gate driver circuit is required? Draw a Bootstrap and isolated gate driver (block diagram or circuit diagram)
 - Explain working of buck-boost converter. Draw waveforms and derive equation to calculate output voltage
 - Compare single phase half bridge inverter and full bridge inverter (any five points)
- Q3. Solve any Two out of Three 10 marks each**
- Defined different performance parameters of single-phase bridge inverter.
 - Explain gate triggering techniques of SCR.
 - Describe the working of three phase bridge Inverter for 180° conduction mode and draw the gating signals and phase voltages.
- Q4. Solve any Two out of Three 10 marks each**
- Draw the circuit diagram for a Boost dc to dc converter. Explain the functioning and draw the following waveforms (i) Inductor voltage; (ii) Inductor current; (iii) Capacitor current; (iv) Capacitor voltage and (v) Switch current.
 - Explain any two voltage commutation techniques for SCR.
 - Explain different PWM techniques with appropriate waveforms.
- Q5. Solve any Two out of Three 10 marks each**
- Draw waveforms and explain single phase controlled rectifier diving R-L load with and without freewheeling diode.
 - Explain working of SCR and V-I characteristics of it.
 - Explain different PWM techniques with appropriate waveforms.
- Q6. Solve any Two out of Three 10 marks each**
- Compare power BJT, MOSFT and IGBT
 - Explain working of SCR and V-I characteristics of it.
 - Explain Turn-ON techniques of SCR.
