

SE (ELEC) sem IV 'C' scheme Summa 2024 Exam

Date - 21/5/25

Duration: 3hrs

[Max Marks: 80]

- Note:** 1) Question No. 1 is compulsory
 2) Attempt any three questions out of remaining five
 3) All Questions carry equal marks
 4) Assume suitable data if required and state it clearly

- Q1 Attempt any FOUR [20]
 a. Explain significance of free-wheeling diode. [5]
 b. Compare power BJT, MOSFET and IGBT [5]
 c. Explain need of Heat Sink in PE circuits [5]
 d. Define Latching and Holding current.
 e. Give applications of DC to DC converter. [5]
 f. Explain any one forced commutation circuit [5]
- Q2. a) Defined different performance parameters of single-phase bridge inverter. [10]
 b) Draw and explain PWM techniques for the control of output voltage of Inverters. [10]
- Q3. a) Draw and explain 3-phase full bridge converter and draw following wavwforms for $\alpha=30^\circ$ 1. supply voltage, 2. firing pulses, 3. Load voltage for resistive load. [10]
 b) What is a safe operating area of a semiconductor switch? How is the conduction and switching loss calculated? [10]
- Q4. a) Draw and explain single phase full Dual converter. [10]
 b) Explain different protection techniques of SCR in detail. [10]
- Q5. a) Draw and explain Buck regulator with waveforms and derive the relation for output voltage. [10]
 b) Draw and explain 3 phase inverter in 120° mode of operation [10]
- Q6. Write short notes on (any two) [20]
 a) Two-transistor's analogy of SCR
 b) Gate triggering circuits of SCR
 c) Bootstrap driver circuit