

Question Bank (G scheme)

Name of subject: POWER ELECTRONICS
Subject code: 17444
Semester: IV

Unit Test :II
Course : IS/IE/EJ

CHAPTER 1. Power Electronics (10 mks)

3 MKS

- 1) State the phenomenon of breakdown in NPN power transistor with proper output characteristics.
- 2) State any three advantages of IGBT.

4 MKS

- 3) State different operating regions of power transistor. What is primary and secondary breakdown?
- 4) Draw the labeled constructional diagram of N channel IGBT.
- 5) Compare power transistor & power MOSFET with respect to
 - a. symbol
 - b. switching speed
 - c. SiO₂ layer
 - d. On state losses
 - e. Application

CHAPTER 4 Phase Controlled Rectifier (24 mks)

3 MKS

- 6) Define any two performance parameter of inverter.
- 7) Define chopper & State its classification.
- 8) Define inverter and classify it.

4 MKS

- 9) Draw circuit diagram of step up chopper and why it is called as step up?
- 10) Draw single phase half bridge inverter with R load & State its operation.
- 11) Show the effect of change of duty cycle on the output voltage of chopper with proper waveforms.

CHAPTER 5. Converters (14 mks)

3 MKS

- 12) Why germanium is not suitable for control rectification ?
- 13) State the need of polyphase rectifier.

4 MKS

- 14) Differentiate controlled & Uncontrolled rectifier with respect to device used, firing circuit, phase angle control & applications.
- 15) Draw the circuit diagram and input & output voltage waveforms of 3 Φ half wave rectifier with resistive load.
- 16) Draw single phase center tapped controlled rectifier with resistive load and its load voltage waveform.
- 17) Draw the neat circuit diagram of single phase half wave controlled rectifier with RL load & describe its working. State the effect of freewheeling diode with suitable waveforms in controlled rectifier.
- 18) A single phase Full wave controlled rectifier is supplied with a voltage $V = 230\sin(314t)$ find average output DC voltage and current if firing angle is 45degrees & load resistance is 100 Ω .

CHAPTER 6 Industrial Control circuits (16 mks)

3 MKS

- 19) Draw labeled circuit of Electronic timer using SCR.
- 20) Draw labeled basic block diagram of UPS.

4 MKS

- 21) Draw the temperature controller using SCR. Explain How temperature is controlled?
- 22) Draw the circuit of speed control of fan using TRIAC. Why DIAC is used ?
- 23) Draw the labeled circuit diagram of battery charger using SCR.
- 24) Draw circuit diagram & write the working of emergency light system.
- 25) Draw block diagram of SMPS & describe its working.