

## Question Bank (I- scheme)

**Name of Course: Basic Power Electronics**

**Course title: 22427**

**Semester: 4I**

**Programme : EJ/IS**

**Unit Test: II**

**Course - BPE**

### **CHAPTER 3: Phase Controlled Rectifiers (14 marks) (CO3)**

#### **2 marks**

1. Why germanium is not suitable for control rectification?
2. State the need of polyphase rectifier.
3. Define firing angle and conduction angle.

#### **4 marks**

4. Differentiate controlled & uncontrolled rectifier with respect to device used, firing circuit, phase angle control & applications.
5. Draw the circuit diagram and input & output voltage waveforms of 3 $\Phi$  half wave controlled rectifier with resistive load.
6. Draw single phase center tapped controlled rectifier with resistive load and its load voltage waveform.
7. Draw the neat circuit diagram of single phase half wave controlled rectifier with R load. State the expression of average output voltage & current of 1 phase half wave controlled rectifier with RL load.
8. 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 $\Omega$ .
9. Describe the effect of freewheeling diode with respect to single phase centre tap fully controlled rectifier with RL load.

### **CHAPTER 4: Choppers and Inverters (14 marks) (CO4)**

#### **2 marks**

10. Define any two performance parameter of inverter.
11. Define chopper & state its classification.
12. List the types of inverters.

#### **4 marks**

13. Name a suitable chopper to increase the output voltage and also explain its operation with neat circuit diagram.
14. Suggest a suitable type of inverter to produce square wave output and write its operation with neat circuit diagram.
15. Show the effect of change of duty cycle on the output voltage of chopper with proper waveforms.
16. Comparison between step up and step down chopper.
17. Differentiate between series and parallel inverter.

## **CHAPTER 5: Industrial Applications of power electronic devices (10 marks) (CO5)**

### **2 marks**

18. Draw labeled basic block diagram of UPS.
19. Draw the basic block diagram of SMPS.

### **4 marks**

20. Explain with circuit diagram the operation of a suitable circuit to control the temperature of a heater.
21. Explain the operation of speed control of fan using TRIAC. Why DIAC is used?
22. Explain with neat sketch the operation of battery charger using SCR.
23. Draw circuit diagram & write the working of emergency light system.
24. If a person use one ceiling fan (80W), two tube lights (40W per tube light), two CFL (7W per CFL) simultaneously with UPS having 12V, 150AH battery. Calculate backup time of UPS battery.
25. List out the selection factors of SMPS.