**Question Bank (I- scheme)**

**Name of Course: Fundamentals of Power Electronics**

**Course title: 22326 Unit Test: II**

**Semester: 3I Course - FPE Programme : EE**

**CHAPTER 4: Phase Controlled Rectifiers (18 marks) (CO4)**

**2 marks**

1. Why germanium is not suitable for control rectification?
2. Define firing angle and conduction angle.
3. Give the merits of freewheeling diode in controlled rectifier circuit (any two).

**4 marks**

1. Differentiate controlled & uncontrolled rectifier with respect to device used, firing circuit, phase angle control & applications.
2. Give the operation of 1 phase fully controlled midpoint configuration with R load with output voltage and output current waveform.
3. Draw the neat circuit diagram of single phase half wave controlled rectifier with RL load. State the expression of average output voltage & current of 1 phase half wave controlled rectifier with RL load.
4. A single phase half wave controlled rectifier is supplied with a voltage V= 230 sin (314t) find average output DC voltage and current if firing angle is 45 degrees & load resistance is 100Ω.
5. A single phase fully controlled rectifier with supplied with voltage V=150 sin314t find the average output dc voltage if α = 45 degrees and load resistance is 100Ω.
6. Explain with circuit diagram the operation of single phase full bridge controlled rectifier with R load.
7. Explain with sketch the operation of single phase fully controlled midpoint configuration with RL load.
8. State the effect of source inductance in controlled rectifiers with waveforms.
9. Justify with sketches the procedure to eliminate reverse power in a fully controlled rectifier with RL load.

**CHAPTER 5: Industrial control circuits (15 marks) (CO5)**

**2 marks**

1. Define Online and Offline UPS.
2. Draw the basic block diagram of SMPS.
3. Define transfer time and back up time of UPS.
4. State the requirements of SMPS.

**4 marks**

1. Explain with circuit diagram the operation of a suitable circuit to control the temperature of a heater.
2. Explain with neat sketch the operation of battery charger using SCR.
3. Draw circuit diagram & write the working of emergency light system.
4. 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.
5. Explain the operation of Burglar alarm system with diagram.
6. Explain the operation of AC circuit breaker with circuit diagram.
7. Explain speed control of the motor by using TRIAC with the help of circuit diagram. Why DIAC is used?
8. Draw labeled basic block diagram of UPS with proper explanation.