Question Bank (K- Scheme)

Unit Test: II

Name of Course: Basic Power Electronics

Course Title: BPE (314363)

Program: EJ **Semester: 4K**

Unit – III Phase controlled rectifiers (16 marks) (CO3)

2 marks

1. Define firing angle and conduction angle.

2. Draw circuit diagram of half wave controlled rectifier with R-L load.

3. Draw circuit diagram of single phase center - tapped full wave controlled rectifier with R load.

4. Explain the operation of three phase full – wave rectifier with circuit diagram. Also sketch its input output waveforms

5. Draw the circuit diagram and waveforms of single phase center tapped full wave controlled rectifier with R load.

4 marks

6. Differentiate controlled & uncontrolled rectifier with respect to devices used, triggering circuit, control of load power & applications.

7. Draw the circuit diagram with input & output voltage waveforms of 3Φ half wave uncontrolled rectifier with resistive load.

8. Draw circuit diagram and voltage – current waveforms of single-phase half- wave-controlled rectifier with Resistive- Inductive (RL) load.

9. A single phase full wave controlled rectifier is supplied with a voltage V = 230 sin 314t. If firing angle 'α' is 30 degrees. Find:

(i) Average dc output voltage (ii) Load current for the load resistance of 100 Ω.

10. Describe the effect of freewheeling diode with respect to single phase Centre tapped fully controlled rectifier with RL load.

11. Explain with circuit diagram and waveform, the operation of single phase center tapped full wave controlled rectifier with R load.

12. Explain the operation of three phase full – wave rectifier with circuit diagram. Also sketch its input output waveforms.

Unit - IV Power Converters (14 marks) (CO4)

2 marks

13. Define Chopper. State its types.

14. Define Inverter. List the types of inverters.

15. List two applications of inverter.

16. Define converters and state its types.

4 marks

17. Suggest a suitable type of inverter to produce square wave output and write its operation with neat circuit diagram

or Describe the operation of parallel inverter with circuits diagram and waveform.

18. Describe series inverter with circuit diagram and waveform.

19. Describe the working principle of step up chopper using IGBT with R Load with neat circuit diagram.

20. Describe the working principle of step down chopper using IGBT.

21. Describe the working principle of Single phase Cyclo-converter using R Load with neat circuit diagram and waveforms.

CHAPTER 5: Industrial Applications of power electronic devices

(10 marks) (CO5)

2 marks

22. Draw labeled basic block diagram of UPS.

23. Draw circuit diagram of light dimmer using DIAC- TRIAC.

24. Draw Flasher circuit using SCR.

4 marks

25. Explain with neat sketch the operation of battery charger using SCR.

26. Explain with circuit diagram the operation of emergency lighting system.

27. Draw and explain the block diagram of MOSFET based SMPS .

28. Describe with circuits diagram the operation of temperature controller using SCR.

29. With the help of block diagram explain working of ONLINE UPS system.

30. Draw and explain Proximity detector using SCR.

31. Draw and explain Flasher circuit using SCR.

2 marks

11. Define Chopper. State its types.

12. Define Inverter. List the types of inverters.

13. List two applications of inverter.

14. Define converters and state its types.

4 marks

15. Suggest a suitable type of inverter to produce square wave output and write its operation with neat circuit diagram.or Describe the operation of parallel inverter with circuits diagram and waveform.

16. Describe series inverter with circuit diagram and waveform.

17. Describe the working principle of step up chopper using power MOSFET or Name a suitable chopper to increase the output voltage and also explain its operation with neat circuit diagram.

18. Describe the working principle of step down chopper using power MOSFET.

Unit - V Industrial applications of power electronic devices

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

2 marks

19. Draw labeled basic block diagram of UPS.

20. Draw the basic block diagram of SMPS.

21. Draw circuit diagram of light dimmer using DIAC- TRIAC.

4 marks

22. Explain with neat sketch the operation of battery charger using SCR.

23. Explain with circuit diagram the operation of emergency lighting system.

24. Draw and explain the block diagram of SMPS.

25. Describe with circuits diagram the operation of temperature controller using SCR.

26. With the help of block diagram explain working of ONLINE UPS system.