

QUESTION BANK (K-Scheme)

Name of subject: Basic Power Electronics

Course Title: BPE (314363)

Unit Test: I

Semester: 4K

Program Code: EJ

Unit - I Power Semiconductor Devices (16 marks) (CO1)

2 marks

1. State any two advantages of IGBT.
2. Draw the symbol & V-I characteristics of
 - a. DIAC
 - b. LASCR
 - c. TRIAC
 - d. LASC
 - e. SUS
 - f. SBS
3. Draw the symbol of SCS and also draw its labelled characteristics with ON state and OFF state.
4. Give two applications of GTO & UJT.
5. State the types of power MOSFETS with diagram.

4 marks

6. Draw the labelled constructional diagram of N channel IGBT.
7. Draw & explain the characteristics of SCR. State the effect of gate current on operation of SCR?
8. Explain two transistor analogy of SCR. Write relation between anode current and Gate current.
9. Define the terms related to SCR:
 - (a) Latching current
 - (b) On state voltage
 - (c) Holding current
 - (d) reverse break over voltage.
10. Draw the constructional diagram of GTO & explain its operation.
11. State 4 modes of operation of TRIAC. Explain any one mode with neat diagram.
12. Explain the operation of PUT.
13. Draw and Explain Working of SBS.
14. Compare UJT & PUT on the basis of-
 - (a) Construction
 - (b) Symbol
 - (c) Working Principle
 - (d) Applications.

15. Explain the operation of DIAC
16. Compare power BJT with power MOSFET and IGBT

Unit - I: Triggering and Commutation methods of SCR (14 marks) (CO2)

2 marks

17. Define commutation. State the types of commutation.
18. State the need of isolation in pulse transformer in triggering circuits and give its two applications.
19. List out triggering methods for SCR. Which method is mostly preferred?
20. Compare forced commutation with natural commutation on the basis of
 - i) input supply
 - ii) circuit component requirement
 - iii) applications.

4 marks

21. Show the effect of resistance variations on firing & conduction angle with waveform in RC triggering.
22. Explain the working of resistance triggering with neat waveforms.
23. Draw the circuit diagram of UJT relaxation oscillator and write the expression for frequency.
24. Draw & explain the operation of PUT relaxation oscillator.
25. Draw and explain class A commutation circuit with its neat waveform.
26. Draw and explain the circuit diagram of Class C commutation.
27. State the need of snubber circuit. Draw di/dt and dv/dt protection circuit.