Power Electronic & PLC

TWO MARKS QUESTION:-

1. Define latching current and holding current.
2. Write the full form of GTO and IGBT.
3. Define firing angle (a), Conduction angle (y) and Extinction angle (B).
4. Differentiate between DIAC and TRIAC.
5. Define Snobbier circuit.
6. Write down the need of a free-wheeling diode in a circuit.
7. Define inverter and write any two applications of inverter.
8. Define SMPS and mention any two of its advantages over voltage regulators.
9. Draw the symbol for NO, NC and Output coil.
10. List down any two applications of PLC.
11. Differentiate between DIAC and TRIAC.
12. Define Phase Angle and Extinction angle of controlled rectifier.
13. Define latching current and holding current of SCR.
14. Draw the Snobbier circuit to protect SCR.
15. What is freewheeling diode and why it is needed?
16. What is SMPS? Why it is preferred in comparison to linear regulator?
17. What is natural commutation? Where it is used?
18. Define reliability of SCR and Mean Time between Failure (MTBF).
19. What are different modules in PLC?
20. What is the purpose of latch coil?
21. Explain briefly different TURN ON methods of SCR.
22. Define Latching current and Holding current.
23. What is voltage clamping device? Give some example.
24. What are the advantages of using a free-wheeling diode in a rectifier circuit?
25. Define storage time of power BJT.
26. What do you mean by duty cycle?

27. Draw V-1 characteristics of a thyristor?
28. What are the applications of cycloconverter?
29. Define reverse recovery time of a diode. What is softness factor?
30. What are the uses of no-break UPS?
31. What do you mean by electric drives?
32. What is delay time?
33. What is the difference between natural commutation and forced commutation?
34. What is surge current rating of thyristor ?
35. Classify inverter.
36. What is cycloconverter and where it is used?
37. What do you mean by electrical drives?
38. What do you mean by power BJT?
39. What are the turns on methods of thyristor?
40. Why is duty cycle?
41. What is rise time?
42. Draw the symbol of GTO and also give its application (any two).
43. What is latching current?
44. What is the function of buck converter?
45. What are the different turn-on methods of Thyristor?
46. What do you mean by duty cycle?
47. Define Inverter.
48. Define Chopper.
49. Draw the symbols of UJT, power BJT.
50. Define holding current and latching current. What are the advantages of using free-wheeling diode?
51. What is rise time?
52. What do you mean by phase angle control of thyristor?
53. What is hatching current?
54. What is the difference between uncontrolled rectifier and controlled rectifier?
55. What is the use of UPS?
56. What is the effect of freewheeling diode?

57. What is the difference between power diode and signal diode?
58. Write the name of any two members of thyristor family.
59. Derive firing angle and conduction angle of SCR.
60. What is SMPS and why it is preferred in comparison to linear regulator?
61. What is forward dv/dt rating of thyristor?
62. What are the various Protections adopted for power semiconductor devices.
63. What is Snobbier Ckt. and why it is used.
64. What do you mean by Duty cycle of a Chopper?
65. What is a Triac and where it is used.
66. What are the different control strategies in Chopper? And which of them is better.
67. What do you mean by 'regulation factor' of a voltage regulator?
68. State the applications of Cyclo-converter.
69. What is the application of a Chopper?
70. Why an inductor is used in di/dt protection Ckt .
71. Why MOSFET is a voltage driven device.
72. Define holding current.
73. Define forward break over voltage.
74. Define latching current of SCR?
75. Define commutation and what are the two conditions for Thyristor commutations?
76. What is a freewheeling diode and why it is needed?
77. Define holding current? Which current is more i.e. holding and latching current?
78. Draw two transistor model of SCR.
79. Name any two firing i.e. triggering methods.
80. Write down the expression for speed of an induction motor in terms of frequency.

FIVE MARK QUESTIONS:-

1. Describe briefly the different Turn On methods of SCR.
2. Explain the operation and construction of IGBT and its application.

3. With neat circuit diagram explain the working of step-down chopper.
4. Explain the operation of single phase half bridge voltage source inverter with resistive load.
5. Draw the block diagram of SMPS and explain its operation.
6. Draw the ladder diagrams of AND, OR, NAND, NOR and XOR gates.
7. Explain the different parts of PLC by drawing the block diagram and also explain the purpose of each part of PLC.
8. Explain briefly different TURN ON methods of SCR.
9. What are the modes of operation of SCR? Explain.
10. Describe single phase full-wave controlled converter circuit for R-L load with necessary circuit diagram?
11. Explain the control strategies of choppers?
12. How can gate of a thyristor be protected?
13. Describe the principle of a thyristor using two-transistor analogy.
14. With a neat circuit diagram and graph, discuss single phase full wave AC voltage regulator.
15. Explain speed control of induction motor drives by stator volte what are the modes of operation of SCR? Explain.
16. Explain any three turn on methods of thyristor.
17. Describe overcurrent and gate protection of thyristor.
18. Explain resonant pulse commutation of thyristor.
19. Describe operation of single phase half wave converter with RL load.
20. Explain working of type B chopper.
21. Describe operation of Buck Boost converter.
22. Explain speed control of induction motor by stator voltage control method.
23. Show the two transistor model of SCR and explain its operation.
24. Discuss dv/dt and di/dt protection of power semiconductor devices.
25. Explain different turn-ON method of SCR.
26. Explain the principle of operation of single phase half-controlled converter circuit with R-load.
27. Explain working of a half-wave converter with R-L load with and without freewheeling diode. Show the O/P waveforms.

28. Explain the operation of speed control of an induction motor by stator frequency control.
29. Describe the construction and operation of power diode.
30. Explain the working of a half-wave converter with R-L load with and without freewheeling diode. Show the O/P waveforms under the above
31. What is chopper? Explain the working of down chopper with neat diagram. use. a step-
32. Explain the contruction and working of power diode.
33. Explain snubber circuit.
34. Discuss high dv/dt and di/dt protection of power semiconductor devices. (1) Describe any one method for turn-off of Thyristor.
35. Explain the principle of operation of step-up chopper.
36. Explain the three turn on methods of Thyristor.
37. Explain single phase half-bridge converter.
38. Explain single phase full converter DC drive with circuit diagram.
39. Explain single phase full wave AC regulator.
40. Explain single phase voltage source half bridge inverter with resistive load.
41. How thyristor is protected by gate protection?
42. Show the two transistor model of SCR and explain its operation.
43. Write a short note on pulse transformer.
44. State the various causes of damage of thyristor and discuss the protection against each of them.
45. Explain any one method of speed control of AC motors.
46. State the Principle of working of inverter and give its classification.
47. Discuss the current ratings of SCR in detail?
48. What are the differences between DC Motor control and AC motor control and write the working of stator voltage control method of AC motor.
49. Describe the Turn-off of a SCR. What is the turn ON methods for SCR?

TEN MARK QUESTIONS

1. Explain the construction, operation of SCR and draw its V-I characteristics curve.
2. With neat circuit diagram and waveforms explain about RC-firing of SCR.
3. Explain with circuit diagram and waveforms of the operation of fully (full wave) controlled single phase bridge converter with Resistive load.
4. Draw the diagram of a single phase to single phase Step down cyclo-converter (mid-point) with pure Resistive load and explain and draw its waveform.
5. Define UPS and explain the working of on-line and off-line UPS system
6. Explain operation of single phase full wave converter with RL load and freewhelling diode.
7. Describe the different chopper configurations (Class A, Class B, Class C, Class D only).
8. Explain operation of on-line and off-line UPS with neat circuit diagram.
9. Explain with a neat circuit diagram, Step-up and Step-down midpoint cyclo converter.
10. Draw the block diagram of PLC system and explain each block in details.
11. Derive the expression for output voltage and current of single phase half wave phase controlled rectifier for R-L load?
12. Explain the poeration of Boost converter (B) What are the advantages and disadvantages of Nickel-Cadmium battery used in UPS?
13. Explain with a neat circuit diagram, Step-up and step-down midpoint cycloconverter.
14. Describe the operation of single phase voltage source full bridge inverter with resistive load.
15. Write short notes on any two: (a) Switching characteristics of IGBT (B)Class A Commutation(c) Resistance firing circuit for SCR
16. Explain single phase voltage source series invertor.
17. Explain working of RC firing circuit.
18. Explain switching characteristics of SCR with necessary diagram.
19. Explain operation of single phase full-wav converter with RL load and free wheeling diode.
20. Describe working of single phase to single phase step down cycloconverter.
21. Explain the principle and operation of a UPS system.
22. Explain the over-voltage and over-current protection for Thyristor.
23. Explain the principle of operation of single-phase to single phase step-up Cyclo-converter.
24. With necessary diagram explain the bridge converter circuit.
25. Describe the operation of voltage-source parallel inverter circuit.
26. Explain the operation of UJT and also justify how it can be used as a relaxation oscillator.
27. Explain the VI-characteristics of SCR and applications of SCR.
28. Explain the Resistance firing circuit for SCR.
29. Explain principle of operation of thyristor with V-I characteristics.
30. Explain gate triggering of thyristor by Resistor firing .
31. Explain single phase full wave converter with R- L load, with circuit diagram.
32. Explain constructioin and working principle of MOSFET.
33. Explain the constuction and working of IGBT.
34. Explain Buck-Boost converter with its waveforms.

35. Explain the Principle of working of Switch Mode power supply with a neat Ckt. diagram.
36. Explain the working of a step-down cycloconverter with necessary circuit diagram and output waveforms.
37. Discuss the Principle of operation and application of power transistor.
38. Design a Snubber Circuit and state where it is used.
39. With a neat circuit diagram explain working of a 1ϕ full wave bridge rectifier.
40. Explain single phase half wave rectifier with inductive load with a neat diagram.