1. What is the basic structure of a power diode?

a) NPN configuration
b) PNP configuration
c) PN junction
d) None of the above

Answer: c) PN junction

Explanation: A power diode consists of a PN junction, where one side is doped with a material having excess of electrons (N-type) and the other side is doped with a material having excess of holes (P-type).

2. Which characteristic represents the relationship between voltage and current in a diode?

a) I-V curve
b) V-I curve
c) P-V curve
d) Q-I curve

Answer: b) V-I curve

Explanation: V-I curve (voltage-current curve) illustrates the relationship between voltage and current in a diode. It typically shows exponential behavior for forward bias and negligible current for reverse bias.

3. What is the basic structure of a DIAC?

a) PN junction
b) Four layers of alternating N and P-type semiconductor material
c) Three layers of alternating N and P-type semiconductor material
d) None of the above

Answer: b) Four layers of alternating N and P-type semiconductor material

Explanation: DIAC (Diode for Alternating Current) is a four-layer device, consisting of alternating N and P-type semiconductor layers.

4. What type of device is a TRIAC?

a) Unipolar junction transistor
b) Bipolar junction transistor
c) Thyristor
d) None of the above

Answer: c) Thyristor

Explanation: TRIAC (Triode for Alternating Current) is a type of thyristor that can conduct current in both directions.

5. What is the construction of a power BJT?

a) It consists of four alternating layers of N and P-type semiconductor material
b) It consists of three layers of alternating N and P-type semiconductor material
c) It consists of a P-type semiconductor material only
d) None of the above

Answer: b) It consists of three layers of alternating N and P-type semiconductor material

Explanation: Power Bipolar Junction Transistor (BJT) typically consists of three layers of semiconductor material: emitter, base, and collector, with alternating N and P-type doping.

6. What is quasisaturation in a power BJT?

a) A state where the BJT is fully saturated
b) A state where the BJT is almost saturated
c) A state where the BJT is not conducting
d) A state where the BJT is in reverse bias

Answer: b) A state where the BJT is almost saturated

Explanation: Quasisaturation refers to a state in which the BJT is nearly saturated, meaning it is conducting heavily but not fully saturated.

7. What is primary breakdown in a power BJT?

a) Breakdown due to excessive collector current
b) Breakdown due to excessive base current
c) Breakdown due to excessive emitter current
d) None of the above

Answer: b) Breakdown due to excessive base current

Explanation: Primary breakdown in a power BJT occurs when excessive base current damages the base-emitter junction.

8. What is secondary breakdown in a power BJT?

a) Breakdown due to excessive collector current
b) Breakdown due to excessive base current
c) Breakdown due to excessive emitter current
d) None of the above

Answer: a) Breakdown due to excessive collector current

Explanation: Secondary breakdown in a power BJT occurs when excessive collector current leads to localized heating and subsequent failure.

9. What is the basic structure of an IGBT?

a) It consists of four alternating layers of N and P-type semiconductor material
b) It consists of three layers of alternating N and P-type semiconductor material
c) It consists of a P-type semiconductor material only
d) None of the above

Answer: b) It consists of three layers of alternating N and P-type semiconductor material

Explanation: Insulated Gate Bipolar Transistor (IGBT) typically consists of three layers of semiconductor material: emitter, base, and collector, similar to a BJT.

10. Which characteristic represents the relationship between voltage and current in an IGBT?

a) I-V curve
b) V-I curve

c) P-V curve
d) Q-I curve

Answer: b) V-I curve

Explanation: V-I curve (voltage-current curve) illustrates the relationship between voltage and current in an IGBT, similar to other semiconductor devices.

11. What is the basic structure of a power MOSFET?

a) It consists of four alternating layers of N and P-type semiconductor material
b) It consists of three layers of alternating N and P-type semiconductor material
c) It consists of a P-type semiconductor material only
d) None of the above

Answer: d) None of the above

Explanation: A power MOSFET typically consists of a silicon substrate with a thin layer of silicon dioxide (SiO2), on top of which are deposited metal layers for the source, gate, and drain.

12. Which characteristic represents the relationship between voltage and current in a Thyristor?

a) I-V curve
b) V-I curve
c) P-V curve
d) Q-I curve

Answer: a) I-V curve

Explanation: The I-V curve (current-voltage curve) represents the relationship between voltage and current in a Thyristor, showing its switching behavior.

13. What is the basic structure of a Thyristor?

a) It consists of four alternating layers of N and P-type semiconductor material
b) It consists of three layers of alternating N and P-type semiconductor material
c) It consists of a P-type semiconductor material only
d) None of the above

Answer: b) It consists of three layers of alternating N and P-type semiconductor material

Explanation: Thyristors, including SCR (Silicon Controlled Rectifier), typically consist of three layers of semiconductor material: anode, cathode, and gate.

14. What are the static and dynamic characteristics of a Thyristor?

a) Static characteristics describe behavior under constant conditions, while dynamic characteristics describe behavior under changing conditions
b) Static characteristics describe behavior under changing conditions, while dynamic characteristics describe behavior under constant conditions
c) Static characteristics describe behavior under AC conditions, while dynamic characteristics describe behavior under DC conditions
d) None of the above

Answer: a) Static characteristics describe behavior under constant conditions, while dynamic

characteristics describe behavior under changing conditions

Explanation: Static characteristics refer to the steady-state behavior of a Thyristor, while dynamic characteristics describe its behavior during switching events or transient conditions.

15. What are the device specifications and ratings of a Thyristor?

a) Maximum current, voltage, and power ratings
b) Minimum current, voltage, and power ratings
c) Thermal conductivity and resistivity
d) None of the above

Answer: a) Maximum current, voltage, and power ratings

Explanation: Device specifications and ratings of a Thyristor typically include maximum current, voltage, and power ratings, which indicate the limits of its operation.

16. What methods are used for turning on a Thyristor?

a) Forward voltage triggering and gate triggering
b) Reverse voltage triggering and base triggering
c) Reverse voltage triggering and gate triggering
d) Forward voltage triggering and base triggering

Answer: a) Forward voltage triggering and gate triggering

Explanation: Thyristors can be turned on using forward voltage triggering (reaching a certain voltage level across the device) or gate triggering (applying a pulse to the gate terminal).

17. What is the basic structure of a gate triggering circuit using UJT?

a) It consists of a UJT and a resistor
b) It consists of a UJT and a capacitor
c) It consists of a UJT, a resistor, and a capacitor
d) None of the above

Answer: c) It consists of a UJT, a resistor, and a capacitor

Explanation: A gate triggering circuit using UJT typically includes a UJT (Unijunction Transistor), a resistor to limit current, and a capacitor for timing purposes.

18. Which component in a power diode is responsible for allowing current flow?

a) Cathode
b) Anode
c) Base
d) Gate

Answer: b) Anode

Explanation: In a power diode, current flows from the anode (positive terminal) to the cathode (negative terminal) when the diode is forward biased.

19. What happens to the current flow in a power BJT when it enters quasisaturation?

a) It increases rapidly
b) It decreases rapidly

c) It remains constant
d) It fluctuates

Answer: c) It remains constant

Explanation: In quasisaturation, the current flow in a power BJT remains nearly constant as the device is nearly saturated.

20. What is the purpose of the gate in a Thyristor?

a) To control the flow of current
b) To amplify the current
c) To protect the device from overvoltage
d) None of the above

Answer: a) To control the flow of current

Explanation: The gate in a Thyristor is used to control the turning on and off of the device by applying a triggering signal.