

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 (SiO_2), 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.