1. What is the basic construction of a Bipolar Junction Transistor (BJT)?

a) It consists of two layers of P-type semiconductor sandwiching a layer of N-type semiconductor
b) It consists of two layers of N-type semiconductor sandwiching a layer of P-type semiconductor
c) It consists of a single layer of semiconductor
d) It consists of multiple layers of semiconductor stacked together

Answer: b) It consists of two layers of N-type semiconductor sandwiching a layer of P-type semiconductor

Explanation: A BJT typically consists of three semiconductor regions: emitter (N-type), base (P-type), and collector (N-type), forming a sandwich-like structure.

2. What is the primary current component in a Bipolar Junction Transistor (BJT)?

a) Emitter current (IE)
b) Base current (IB)
c) Collector current (IC)
d) Leakage current

Answer: c) Collector current (IC)

Explanation: Collector current (IC) is the primary current component flowing through the collector terminal of a BJT.

3. Which configuration provides a high input impedance and low output impedance in a BJT

amplifier?

a) Common Base (CB)
b) Common Emitter (CE)
c) Common Collector (CC)
d) None of the above

Answer: a) Common Base (CB)

Explanation: Common Base configuration provides a high input impedance and low output impedance, making it suitable for impedance matching applications.

4. What effect causes the Early effect in Bipolar Junction Transistors (BJTs)?

a) Base width modulation
b) Avalanche breakdown
c) Saturation current
d) Thermal runaway

Answer: a) Base width modulation

Explanation: The Early effect, also known as base width modulation, causes an increase in the width of the base as the collector-base voltage increases, leading to a reduction in the effective base width and an increase in collector current.

5. In which region of operation does a BJT operate as an amplifier?

a) Active region

b) Cut-off region
c) Saturation region
d) Inverse region

Answer: a) Active region

Explanation: The active region is where a BJT operates as an amplifier, characterized by both junctions being forward-biased.

6. Which model is commonly used to describe the behavior of a BJT in terms of current components?

a) Kirchhoff’s laws
b) Ohm’s law
c) Ebers-Moll model
d) Maxwell’s equations

Answer: c) Ebers-Moll model

Explanation: The Ebers-Moll model is commonly used to describe the behavior of a BJT in terms of its current components, considering both forward and reverse biased junctions.

7. What is the maximum power dissipation rating of a transistor denoted as?

a) Pmax
b) Pd
c) Vce(max)
d) Ib(max)

Answer: b) Pd

Explanation: The maximum power dissipation rating of a transistor is denoted as Pd, which represents the maximum amount of power the transistor can dissipate without being damaged.

8. Which biasing method provides the most stable operating point in a BJT amplifier circuit?

a) Fixed bias
b) Self bias
c) Voltage Divider bias
d) Collector to base bias

Answer: b) Self bias

Explanation: Self biasing provides automatic stabilization of the operating point, making it the most stable among the given biasing methods.

9. What is the purpose of load-line analysis in BJT amplifier circuits?

a) To determine the gain of the amplifier
b) To calculate the biasing resistors
c) To establish the operating point
d) To minimize power dissipation

Answer: c) To establish the operating point

Explanation: Load-line analysis is used to establish the operating point of a BJT amplifier

circuit by graphically determining the intersection of the load line with the DC load line.

10. In which biasing configuration is the base-emitter junction reverse-biased?

a) Fixed bias
b) Self bias
c) Voltage Divider bias
d) Collector to base bias

Answer: d) Collector to base bias

Explanation: In Collector to base bias configuration, the base-emitter junction is reverse-biased, providing stability to the operating point.

11. Which region of operation is characterized by both junctions of a BJT being reverse-biased?

a) Active region
b) Cut-off region
c) Saturation region
d) Inverse region

Answer: b) Cut-off region

Explanation: In the cut-off region, both the base-emitter and collector-base junctions of a BJT are reverse-biased, resulting in minimal collector current.

12. What type of transistor is sensitive to light and commonly used in optoelectronic

applications?

a) NPN transistor
b) PNP transistor
c) JFET
d) Phototransistor

Answer: d) Phototransistor

Explanation: Phototransistors are transistors that are sensitive to light and are commonly used in optoelectronic applications for light detection and sensing.

13. Which method of bias stabilization uses a resistor connected between the collector and base terminals?

a) Fixed bias
b) Self bias
c) Voltage Divider bias
d) Collector to base bias

Answer: d) Collector to base bias

Explanation: Collector to base bias stabilization method uses a resistor connected between the collector and base terminals to stabilize the operating point.

14. What is the main purpose of transistor biasing circuits?

a) To control the transistor’s switching speed

b) To control the transistor’s amplification factor
c) To establish the operating point
d) To minimize power dissipation

Answer: c) To establish the operating point

Explanation: Transistor biasing circuits are used to establish the operating point of the transistor, ensuring proper amplification or switching behavior.

15. What happens to the collector current in a BJT when it operates in the saturation region?

a) It decreases
b) It remains constant
c) It increases
d) It becomes zero

Answer: c) It increases

Explanation: In the saturation region, the collector current of a BJT increases significantly due to both junctions being forward-biased and allowing maximum current flow.

16. Which configuration of a BJT amplifier provides a voltage gain greater than unity?

a) Common Base (CB)
b) Common Emitter (CE)
c) Common Collector (CC)
d) None of the above

Answer: b) Common Emitter (CE)

Explanation: Common Emitter configuration provides a voltage gain greater than unity, making it suitable for voltage amplification applications.

17. What effect can cause a BJT to undergo thermal runaway?

a) Base width modulation
b) Avalanche breakdown
c) Saturation current
d) Excessive heating

Answer: d) Excessive heating

Explanation: Excessive heating can cause a BJT to undergo thermal runaway, where increasing temperature leads to increased collector current, further heating the device.

18. What is the primary purpose of a BJT used as a switch?

a) To amplify signals
b) To regulate voltage
c) To control current flow
d) To generate oscillations

Answer: c) To control current flow

Explanation: A BJT used as a switch is primarily employed to control the flow of current through a circuit, either allowing it to flow (ON state) or preventing it (OFF state).

19. What is the primary difference between CB, CE, and CC configurations in a BJT amplifier?

a) Their voltage gains
b) Their input and output impedance
c) Their biasing methods
d) Their current gains

Answer: b) Their input and output impedance

Explanation: The primary difference between CB, CE, and CC configurations lies in their input and output impedance characteristics, affecting their suitability for different applications.

20. Which of the following is NOT a biasing method for BJT transistors?

a) Fixed bias
b) Thermal bias
c) Voltage Divider bias
d) Collector to base bias

Answer: b) Thermal bias

Explanation: “Thermal bias” is not a commonly recognized biasing method for BJT transistors. The other options are all valid methods used in transistor biasing circuits.

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