

Unit-3

PART A: Multiple choice questions

1.The primary purpose of transistor biasing is to

- A) Increase power dissipation
- B) Establish a stable operating point
- C) Reduce collector current to zero
- D) Increase leakage current

Answer: B

2.The operating point of a transistor is commonly known as

- A) Breakdown point
- B) Knee point
- C) Q-point
- D) Cut-in point

Answer: C

3.For faithful amplification, the Q-point should ideally lie

- A) In saturation region
- B) In cutoff region
- C) Near the center of active region
- D) In breakdown region

Answer: C

4.Thermal runaway occurs mainly because

- A) Collector current decreases with temperature
- B) Leakage current increases with temperature
- C) Base current becomes zero
- D) Supply voltage decreases

Answer: B

5.Which biasing method provides the poorest stabilization?

- A) Voltage-divider bias
- B) Collector-to-base bias
- C) Fixed bias

D) Self-bias

Answer: C

6. In a fixed-bias circuit, an increase in β causes

A) Decrease in collector current

B) Increase in collector current

C) No change in collector current

D) Collector current becomes zero

Answer: B

7. The most widely used biasing technique in transistor amplifiers is

A) Fixed bias

B) Collector-to-base bias

C) Voltage-divider bias

D) Base bias

Answer: C

8. The stability of a transistor circuit improves when

A) Dependence on β increases

B) Dependence on temperature increases

C) Dependence on β decreases

D) Collector current becomes maximum

Answer: C

9. The DC load line represents the relationship between

A) I_B and V_{BE}

B) I_C and V_{CE}

C) I_C and I_B

D) I_E and V_{BE}

Answer: B

10. The point where the load line intersects the I_C axis corresponds to

A) $V_{CE} = V_{CC}$

B) $I_C = 0$

C) Saturation current

D) Cutoff voltage

Answer: C

11.The point where the load line intersects the VCE axis corresponds to

A) Saturation

B) Cutoff condition

C) Breakdown

D) Maximum current

Answer: B

12.Voltage-divider bias is preferred because it makes the Q-point

A) Highly β dependent

B) Independent of supply voltage

C) Relatively stable

D) Always at saturation

Answer: C

13.The emitter resistor in a bias circuit provides

A) Positive feedback

B) Negative feedback

C) Oscillation

D) Resonance

Answer: B

14.A transistor driven into saturation behaves approximately as

A) Open switch

B) Closed switch

C) Capacitor

D) Inductor

Answer: B

15.A transistor driven into cutoff behaves approximately as

A) Closed switch

B) Amplifier

C) Open switch

D) Rectifier

Answer: C

16.Collector-to-base bias improves stability because

A) It introduces positive feedback

B) It provides negative feedback

C) It eliminates base current

D) It increases β

Answer: B

17.The slope of the DC load line is determined by

A) β

B) Collector resistance

C) Supply frequency

D) Emitter current

Answer: B

18.If temperature increases, the collector leakage current generally

A) Decreases

B) Remains constant

C) Increases

D) Becomes zero

Answer: C

19.The ideal biasing circuit should keep the operating point unaffected by

A) Temperature variations

B) β variations

C) Supply variations

D) All of these

Answer: D

20.Among the following, the best bias stabilization is achieved by

A) Fixed bias

B) Collector feedback bias

C) Voltage-divider bias

D) Base bias without resistor

Answer: C

PART-B: Fill in the Blanks

1. Biasing means applying suitable _____ voltages and currents to a transistor.

Answer: DC

2. The Q in Q-point stands for _____.

Answer: Quiescent

3. The transistor should operate in the _____ region for linear amplification.

Answer: Active

4. The graphical representation of transistor operation is called the _____ line.

Answer: Load

5. The maximum value of VCE on the load line is equal to _____.

Answer: VCC

6. The collector current at saturation is approximately equal to VCC divided by _____.

Answer: RC

7. The stability factor is commonly represented by the symbol _____.

Answer: S

8. A lower value of stability factor indicates _____ stability.

Answer: Better

9. Thermal runaway may permanently damage the _____.

Answer: Transistor

10. The emitter resistor develops a voltage proportional to emitter _____.

Answer: Current

11. The voltage-divider bias circuit uses _____ resistors to set base voltage.

Answer: Two

12. The resistor connected between collector and base in collector-feedback bias is called the _____ resistor.

Answer: Feedback

13. Negative feedback opposes changes in collector _____.

Answer: Current

14. The operating point shifts due to changes in transistor _____.

Answer: Parameters

15.The collector-emitter voltage is represented by _____.

Answer: VCE

16.The collector current is represented by _____.

Answer: IC

17.The base current is represented by _____.

Answer: IB

18.The emitter current is represented by _____.

Answer: IE

19.Bias stabilization improves the reliability of_____.

Answer: transistor Circuits

20.The purpose of biasing is to ensure distortion-free _____.

Answer: Amplification