

Unit-2

PART A: Multiple choice questions

1.The collector region of a transistor is made physically larger than the emitter region mainly to

- A) Increase current gain
- B) Improve heat dissipation
- C) Reduce leakage current
- D) Increase base current

Answer: B

2.In active mode operation of an NPN transistor,

- A) Both junctions are forward biased
- B) EB junction forward biased and CB junction reverse biased
- C) EB junction reverse biased and CB junction forward biased
- D) Both junctions reverse biased

Answer: B

3.The transistor action is primarily due to

- A) Majority carrier drift across both junctions
- B) Minority carrier injection and collection
- C) Avalanche multiplication
- D) Thermal generation

Answer: B

4.The common-base configuration is characterized by

- A) High current gain and high input resistance
- B) Current gain less than unity
- C) Very high voltage gain only
- D) Zero power gain

Answer: B

5.Among the transistor configurations, the highest input resistance is offered by

- A) CB
- B) CE
- C) CC
- D) Equal in all

Answer: C

6.The common collector configuration is widely used as

- A) Voltage amplifier
- B) Oscillator
- C) Buffer amplifier
- D) Rectifier

Answer: C

7.A transistor with $\alpha = 0.99$ will have β approximately equal to

- A) 9
- B) 49
- C) 99
- D) 199

Answer: C

8.The output characteristics of a CE transistor are plotted between

- A) I_C and V_{CE}
- B) I_C and V_{BE}
- C) I_B and V_{CE}
- D) I_E and V_{BE}

Answer: A

9.The region of operation used for amplification is

- A) Saturation
- B) Cutoff
- C) Active
- D) Breakdown

Answer: C

10.When both transistor junctions are reverse biased, the transistor operates in

- A) Saturation
- B) Active
- C) Breakdown
- D) Cutoff

Answer: D

11.Base-width modulation is commonly known as

- A) Zener effect
- B) Early effect
- C) Hall effect
- D) Skin effect

Answer: B

12.The Early effect causes

- A) Increase in base width
- B) Reduction in collector current
- C) Reduction in effective base width
- D) Increase in emitter resistance

Answer: C

13.The slope of CE output characteristics in active region is mainly due to

- A) Leakage current
- B) Early effect
- C) Temperature rise
- D) Noise

Answer: B

14.Which configuration provides the highest voltage gain?

- A) CC
- B) CE
- C) CB
- D) All equal

Answer: B

15.The output resistance of a CB transistor is generally

- A) Very low
- B) Moderate
- C) High
- D) Zero

Answer: C

16.A transistor is said to be saturated when

- A) Both junctions are forward biased
- B) Both junctions are reverse biased
- C) EB reverse, CB forward
- D) EB forward, CB reverse

Answer: A

17.In CE configuration, a small increase in base current causes

- A) Large change in collector current
- B) No change in collector current
- C) Decrease in collector current
- D) Increase in emitter resistance

Answer: A

18.For a transistor operating in active region,

- A) $I_C = I_E$
- B) $I_C > I_E$
- C) $I_C < I_E$
- D) $I_C = 0$

Answer: C

19.A transistor used as an electronic switch operates between

- A) Active and Breakdown
- B) Cutoff and Saturation
- C) Active and Saturation
- D) Cutoff and Active

Answer: B

20.The most commonly used transistor configuration in practical amplifiers is

- A) CB
- B) CE
- C) CC
- D) None

Answer: B

PART-B: Fill in the Blanks

1. A transistor is a _____ carrier device.

Answer: Bipolar

2. The emitter is _____ doped to inject carriers efficiently.

Answer: Heavily

3. The base region is very _____ and lightly doped.

Answer: Thin

4. The collector current consists mainly of carriers injected from the _____.

Answer: Emitter

5. The relation among transistor currents is $I_E = I_C + \underline{\hspace{2cm}}$.

Answer: I_B

6. The current gain in common-base configuration is denoted by _____.

Answer: α

7. The current gain in common-emitter configuration is represented by _____.

Answer: β

8. The input characteristic of a CE transistor is a plot of I_B versus _____.

Answer: V_{BE}

9. The input characteristic of a CB transistor is a plot of I_E versus _____.

Answer: V_{EB}

10. The ratio $\Delta V_{BE} / \Delta I_B$ gives the transistor parameter _____.

Answer: h_{ie}

11. The ratio $\Delta I_C / \Delta I_B$ gives the transistor parameter _____.

Answer: h_{fe}

12. The parameter h_{re} represents reverse voltage _____.

Answer: Gain

13. The parameter h_{oe} represents output _____.

Answer: Admittance

14. The h-parameters are obtained from transistor _____ curves.

Answer: Characteristics

15.The unit of h_{fe} is _____.

Answer: Dimensionless

16.In an NPN transistor, the majority carriers are _____.

Answer: Electrons

17.In a PNP transistor, the majority carriers are _____.

Answer: Holes

18.The collector-base leakage current is denoted by _____.

Answer: ICBO

19.The emitter-base leakage current is represented by _____.

Answer: IEBO

20.The h-parameter model is widely used for small-signal _____ analysis.

Answer: Amplifier