

1. What is the construction of a JFET?

- a) JFET is constructed using a single type of semiconductor material
- b) JFET is constructed using two different types of semiconductor materials
- c) JFET is constructed using a combination of metal and semiconductor materials
- d) JFET is constructed using only metal materials

Answer: a) JFET is constructed using a single type of semiconductor material

Explanation: JFETs are typically made from a single piece of semiconductor material, either silicon or gallium arsenide.

2. Which of the following describes an n-channel JFET?

- a) The channel between the source and drain is formed by p-type semiconductor material
- b) The channel between the source and drain is formed by n-type semiconductor material
- c) The channel between the source and drain is formed by metal
- d) The channel between the source and drain is formed by insulator material

Answer: b) The channel between the source and drain is formed by n-type semiconductor material

Explanation: In an n-channel JFET, the channel through which current flows is made up of n-type semiconductor material.

3. What are the transfer characteristics of a JFET?

- a) Linear

- b) Quadratic
- c) Exponential
- d) Logarithmic

Answer: c) Exponential

Explanation: The transfer characteristics of a JFET are exponential in nature, showing a rapid increase in drain current as the gate-source voltage is increased beyond the threshold voltage.

4. What parameter determines the voltage gain of a JFET amplifier?

- a) Transconductance ( $g_m$ )
- b) Drain-to-Source resistance ( $r_d$ )
- c) Gate-to-Source voltage ( $V_{gs}$ )
- d) Drain current ( $I_d$ )

Answer: a) Transconductance ( $g_m$ )

Explanation: The voltage gain of a JFET amplifier primarily depends on its transconductance, represented by the symbol ' $g_m$ ', which is the ratio of the change in output voltage to the change in input voltage.

5. Which configuration is characterized by a common-source (CS) FET amplifier?

- a) Input is connected to the source, output is taken from the drain
- b) Input is connected to the gate, output is taken from the source
- c) Input is connected to the drain, output is taken from the source

d) Input is connected to the gate, output is taken from the drain

Answer: d) Input is connected to the gate, output is taken from the drain

Explanation: In a common-source configuration, the input is connected to the gate terminal and the output is taken from the drain terminal.

6. What type of FET configuration is commonly used for voltage amplification?

- a) Common-Drain (CD)
- b) Common-Source (CS)
- c) Common-Gate (CG)
- d) Common-Emitter (CE)

Answer: b) Common-Source (CS)

Explanation: Common-Source configuration is commonly used for voltage amplification in FET circuits due to its high input impedance and medium output impedance.

7. What are the drain characteristics of an Enhancement MOSFET?

- a) Linear
- b) Exponential
- c) Hyperbolic
- d) Constant

Answer: a) Linear

Explanation: The drain characteristics of an Enhancement MOSFET in its active region are linear, showing a linear relationship between drain current and drain-to-source voltage.

8. What type of biasing is required to operate a Depletion MOSFET?

- a) Forward bias
- b) Reverse bias
- c) No biasing is required
- d) Zero bias

Answer: d) Zero bias

Explanation: Depletion MOSFETs operate under zero bias conditions, meaning no external bias voltage is required for their operation.

9. What is the principle of operation of a UJT?

- a) It acts as a voltage-controlled resistor
- b) It acts as a current-controlled resistor
- c) It acts as a voltage-controlled switch
- d) It acts as a current-controlled switch

Answer: a) It acts as a voltage-controlled resistor

Explanation: A UJT operates based on the principle of controlling the resistance between its emitter and one of its bases using an external voltage signal.

10. What is the primary application of a UJT relaxation oscillator?

- a) Voltage amplification
- b) Current amplification
- c) Frequency generation
- d) Phase modulation

Answer: c) Frequency generation

Explanation: UJT relaxation oscillators are commonly used for generating oscillations at a specific frequency, making them suitable for applications such as timing circuits and waveform generation.

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