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FET (Field-Effect Transistor)

1. **What does FET stand for?**
    - A) Field-Electromagnetic Transistor
    - B) Field-Energy Transistor
    - C) Field-Effect Transistor
    - D) Frequency-Effect Transistor
      Answer: C) Field-Effect Transistor
2. **Which of the following is a unipolar device?**
    - A) Bipolar Junction Transistor (BJT)
    - B) Field-Effect Transistor (FET)
    - C) Thyristor
    - D) Diode
      Answer: B) Field-Effect Transistor (FET)
3. **In a FET, the control of current is done by varying the:**
    - A) Gate current
    - B) Gate voltage
    - C) Source current
    - D) Drain current
      Answer: B) Gate voltage
4. **Which terminal in a FET controls the flow of current between the source and drain?**
    - A) Source
    - B) Drain
    - C) Gate
    - D) Substrate
      Answer: C) Gate
5. **The channel in a FET is formed between which two terminals?**
    - A) Gate and Source
    - B) Source and Drain
    - C) Drain and Gate
    - D) Substrate and Gate
      Answer: B) Source and Drain
6. **Which of the following is a type of FET?**

- A) JFET (Junction Field-Effect Transistor)
- B) SCR (Silicon-Controlled Rectifier)
- C) IGBT (Insulated-Gate Bipolar Transistor)
- D) LED (Light Emitting Diode)
  Answer: A) JFET (Junction Field-Effect Transistor)

7. **What type of charge carriers do N-channel FETs use?**
   - A) Electrons
   - B) Holes
   - C) Both electrons and holes
   - D) None of the above
     Answer: A) Electrons

8. **In a FET, the region where the current between source and drain becomes constant is known as:**
   - A) Ohmic region
   - B) Cutoff region
   - C) Saturation region
   - D) Active region
     Answer: C) Saturation region

9. **The FET has a high input impedance because:**
   - A) It is a unipolar device
   - B) The gate is insulated
   - C) It has a high gain
   - D) It operates at low frequencies
     Answer: B) The gate is insulated

10. **In a JFET, if the gate-to-source voltage is increased in the reverse bias direction, the channel:**
    - A) Widens
    - B) Narrows
    - C) Remains unchanged
    - D) Is cut off
      Answer: B) Narrows

11. **Which of the following is an advantage of using a FET over a BJT?**
    - A) Higher gain

- B) Lower input impedance
- C) Higher efficiency
- D) Higher input impedance
  Answer: D) Higher input impedance

12. **What is the primary characteristic of a depletion-mode FET?**
    - A) It conducts with zero gate-to-source voltage
    - B) It does not conduct with zero gate-to-source voltage
    - C) It has a negative threshold voltage
    - D) It has a positive threshold voltage
      Answer: A) It conducts with zero gate-to-source voltage
13. **In which of the following regions does a FET operate as a variable resistor?**
    - A) Cutoff region
    - B) Ohmic region
    - C) Saturation region
    - D) Breakdown region
      Answer: B) Ohmic region
14. **The threshold voltage in a FET is the minimum gate-to-source voltage at which the:**
    - A) Drain current starts to flow
    - B) Source current starts to flow
    - C) Gate current starts to flow
    - D) All of the above
      Answer: A) Drain current starts to flow
15. **Which of the following is NOT an application of FETs?**
    - A) Voltage-controlled resistors
    - B) Analog switches
    - C) Signal amplifiers
    - D) High-current rectifiers
      Answer: D) High-current rectifiers

MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor)

1. **What is the primary difference between a JFET and a MOSFET?**
    - A) JFET is voltage-controlled, while MOSFET is current-controlled
    - B) JFET has a junction gate, while MOSFET has an insulated gate
    - C) JFET has a lower input impedance than MOSFET

- D) JFET is used for high-frequency applications, while MOSFET is for low-frequency
  Answer: B) JFET has a junction gate, while MOSFET has an insulated gate

2. **What material is commonly used as the gate oxide in a MOSFET?**
   - A) Silicon
   - B) Silicon Dioxide
   - C) Germanium
   - D) Gallium Arsenide
     Answer: B) Silicon Dioxide

3. **Which of the following is a key feature of an enhancement-mode MOSFET?**
   - A) It conducts with zero gate-to-source voltage
   - B) It requires a positive gate-to-source voltage to conduct
   - C) It requires a negative gate-to-source voltage to conduct
   - D) It does not conduct under any gate-to-source voltage
     Answer: B) It requires a positive gate-to-source voltage to conduct

4. **In a MOSFET, the drain current is mainly controlled by:**
   - A) Source current
   - B) Drain voltage
   - C) Gate-to-source voltage
   - D) Substrate voltage
     Answer: C) Gate-to-source voltage

5. **What are the two types of MOSFETs?**
   - A) N-type and P-type
   - B) Enhancement-mode and Depletion-mode
   - C) Forward-biased and Reverse-biased
   - D) Positive and Negative
     Answer: B) Enhancement-mode and Depletion-mode

6. **Which of the following is an advantage of MOSFET over BJT?**
   - A) Higher current capability
   - B) Higher switching speed
   - C) Lower input impedance
   - D) Higher thermal stability
     Answer: B) Higher switching speed

7. **The threshold voltage in a MOSFET is the voltage at which the:**

- A) Source current becomes maximum
- B) Drain current becomes zero
- C) Channel starts to form
- D) Gate current becomes maximum
  Answer: C) Channel starts to form

8. **In an N-channel MOSFET, what type of charge carriers form the channel?**
   - A) Electrons
   - B) Holes
   - C) Both electrons and holes
   - D) None of the above
     Answer: A) Electrons

9. **Which terminal is not physically connected to the channel in a MOSFET?**
   - A) Source
   - B) Drain
   - C) Gate
   - D) Substrate
     Answer: C) Gate

10. **What does the "O" in MOSFET stand for?**
    - A) Oxide
    - B) Operation
    - C) Output
    - D) Overdrive
      Answer: A) Oxide

11. **Which region of a MOSFET's operation is used for amplification purposes?**
    - A) Cutoff region
    - B) Saturation region
    - C) Triode region
    - D) Breakdown region
      Answer: B) Saturation region

12. **In a depletion-mode MOSFET, how is the channel formed at zero gate voltage?**
    - A) There is no channel at zero gate voltage
    - B) The channel is already formed
    - C) The channel is formed only at negative gate voltage

- D) The channel is formed only at positive gate voltage
  Answer: B) The channel is already formed

13. **The gate terminal in a MOSFET is insulated from the channel by:**
    - A) A metal layer
    - B) An oxide layer
    - C) A semiconductor layer
    - D) A vacuum
      Answer: B) An oxide layer
14. **In a MOSFET, what happens if the gate-to-source voltage is below the threshold voltage?**
    - A) The MOSFET conducts fully
    - B) The MOSFET does not conduct
    - C) The MOSFET conducts partially
    - D) The MOSFET enters breakdown
      Answer: B) The MOSF
15. **Which of the following is true for a P-channel MOSFET in enhancement mode?**

- A) It conducts when the gate-to-source voltage is positive.
- B) It conducts when the gate-to-source voltage is negative.
- C) It requires a high gate-to-source voltage to turn off.
- D) It has a positive threshold voltage.
  Answer: B) It conducts when the gate-to-source voltage is negative.

Transistors

11. **What type of current flows between the collector and emitter in an NPN transistor?**

- A) Hole current
- B) Electron current
- C) Both hole and electron currents
- D) No current
  Answer: B) Electron current

12. **In a common-base transistor configuration, which terminal is the output?**

- A) Emitter
- B) Collector
- C) Base
- D) Gate
  Answer: B) Collector

13. **What is the primary function of the base terminal in a BJT?**

- A) To amplify the current
- B) To control the flow of current between the emitter and collector
- C) To provide power to the emitter
- D) To act as a load
  Answer: B) To control the flow of current between the emitter and collector

14. **Which configuration provides a high input impedance and low output impedance in a transistor?**

- A) Common-emitter
- B) Common-collector
- C) Common-base
- D) Common-drain
  Answer: B) Common-collector

15. **In a BJT, what happens when the base-emitter junction is forward-biased?**

- A) The collector current becomes zero
- B) The emitter current becomes zero
- C) The transistor is in the cutoff region
- D) The transistor conducts and is in the active region
  Answer: D) The transistor conducts and is in the active region

16. **What is the main purpose of a Darlington pair transistor configuration?**

- A) To increase voltage gain
- B) To increase current gain
- C) To increase input impedance
- D) To provide thermal stability
  Answer: B) To increase current gain

17. **In a transistor, what determines the gain of a common-emitter amplifier?**

- A) The base current
- B) The emitter resistance
- C) The collector resistor
- D) The base-emitter voltage
  Answer: C) The collector resistor

18. **What type of transistor is often used for switching applications due to its high speed?**

- A) BJT

- B) MOSFET
- C) IGBT
- D) SCR
  Answer: B) MOSFET

19. **In a bipolar junction transistor, the majority carriers in the base are:**

- A) Electrons
- B) Holes
- C) Both electrons and holes
- D) None of the above
  Answer: B) Holes

20. **Which of the following configurations is used for impedance matching in transistor circuits?**

- A) Common-emitter
- B) Common-collector
- C) Common-base
- D) Common-drain
  Answer: B) Common-collector