

Unit-5

PART A: Multiple choice questions

1. An SCR can be turned ON by

- A) Reducing anode current below holding current
- B) Applying a gate pulse
- C) Reversing anode voltage
- D) Disconnecting the gate

Answer: B

2. Once an SCR is turned ON, it remains ON until

- A) Gate signal is removed
- B) Anode current falls below holding current
- C) Supply voltage increases
- D) Gate current increases

Answer: B

3. The negative resistance region is a characteristic feature of

- A) Zener diode
- B) Tunnel diode
- C) LED
- D) Schottky diode

Answer: B

4. Tunnel diode operation is based on

- A) Avalanche effect
- B) Tunneling phenomenon
- C) Thermionic emission
- D) Photoelectric effect

Answer: B

5. The capacitance of a varactor diode varies with

- A) Forward current
- B) Reverse bias voltage
- C) Temperature only

D) Gate voltage

Answer: B

6. A varactor diode is mainly used in

A) Voltage regulation

B) Tuned circuits

C) Rectification

D) Amplification

Answer: B

7. A photodiode normally operates under

A) Forward bias

B) Reverse bias

C) Zero bias only

D) Saturation

Answer: B

8. The current in a photodiode increases with

A) Reverse voltage only

B) Incident light intensity

C) Temperature only

D) Load resistance

Answer: B

9. A solar cell converts

A) Electrical energy into light

B) Heat into light

C) Light energy into electrical energy

D) Electrical energy into heat

Answer: C

10. Which device has the fastest switching speed?

A) PN diode

B) Zener diode

C) Schottky diode

D) SCR

Answer: C

11.The low forward voltage drop of a Schottky diode is due to

A) Minority carrier conduction

B) Majority carrier conduction

C) Avalanche effect

D) Tunneling effect

Answer: B

12.In a JFET, the gate-channel junction is normally

A) Forward biased

B) Reverse biased

C) Unbiased

D) Short circuited

Answer: B

13.A JFET is a

A) Bipolar device

B) Current-controlled device

C) Voltage-controlled device

D) Power-controlled device

Answer: C

14.The drain current in a JFET becomes constant in the

A) Ohmic region

B) Saturation region

C) Breakdown region

D) Cutoff region

Answer: B

15.An enhancement MOSFET operates in the absence of gate voltage as

A) Fully ON

B) Fully saturated

C) Normally OFF

D) Breakdown

Answer: C

16. Which MOSFET can conduct at $V_{GS} = 0$ V?

A) Enhancement MOSFET

B) Depletion MOSFET

C) Power MOSFET only

D) None

Answer: B

17. The major advantage of FinFET technology is

A) Increased leakage current

B) Better electrostatic gate control

C) Higher power consumption

D) Larger chip area

Answer: B

18. CNTFETs are expected to offer high performance because of

A) High junction capacitance

B) Ballistic transport

C) Large leakage current

D) High resistivity

Answer: B

19. Compared to conventional CMOS, FinFETs generally exhibit

A) Higher leakage

B) Better short-channel control

C) Lower scalability

D) Larger dimensions

Answer: B

20. Among CMOS, FinFET, and CNTFET technologies, the device with the greatest long-term scaling potential is generally

A) CMOS

B) Bipolar transistor

C) CNTFET

D) SCR

Answer: C

PART-B: Fill in the Blanks

1.SCR stands for _____ Controlled Rectifier.

Answer: Silicon

2.An SCR consists of _____ semiconductor layers.

Answer: Four

3.The three terminals of an SCR are anode, cathode, and _____.

Answer: Gate

4.The peak current in a tunnel diode occurs at the _____ point.

Answer: Peak

5.The minimum current in the negative resistance region of a tunnel diode is called _____ current.

Answer: Valley

6.A varactor diode is also known as a _____ diode.

Answer: Varicap

7.The operation of a photodiode is based on the _____ effect.

Answer: Photoelectric

8.The current generated by a photodiode due to illumination is called _____

Answer: Photocurrent

9.A solar cell is essentially a large-area _____ junction.

Answer: PN

10.LED stands for _____.

Answer: Light Emitting Diode

11.The color emitted by an LED depends on the semiconductor _____ used.

Answer: Material

12.The source, gate, and drain are the three terminals of a _____.

Answer: FET

13.JFET stands for _____

Answer: Junction Field Effect Transistor

14.The voltage at which the JFET channel closes is called _____ voltage.

Answer: Pinch-off

15.MOSFET stands for Metal Oxide Semiconductor _____ Effect Transistor.

Answer: Field

16.The gate terminal of a MOSFET is insulated from the channel by a thin layer of _____.

Answer: Oxide

17.FinFET is a _____-dimensional transistor structure.

Answer: Three

18.CNT in CNTFET stands for Carbon _____ Tube.

Answer: Nano

19.Ballistic transport refers to carrier movement with minimal _____.

Answer: Scattering

20.CMOS stands for Complementary Metal Oxide _____.

Answer: Semiconductor