

## **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