#### **UNIT 5: LINEAR AND DIGITAL ELECTRONICS**

- 1. The gain of a non-inverting amplifier is given by:
  - a) 1 + (Rf/Rin)
  - b) (Rf/Rin)
  - c) 1 + (Vin/Vout)
  - d) None of the above

## 2. The voltage gain of an inverting amplifier is:

- a) (Rf/Rin)
- b) Rf/Rin
- c) (Vin/Vout)
- d) -1

## 3. What is the ideal output of an op-amp when used as a voltage follower?

- a) Zero
- b) Input voltage
- c) Double the input voltage
- d) Half the input voltage
- 4. Which logic gate has the truth table output that is true only when both inputs are false?
  - a) AND gate
  - b) OR gate
  - c) NAND gate
  - d) NOR gate

### 5. Which Boolean expression is simplified as A + A'B?

- a) A + B
- b) A'
- c) A'B
- d) A

### 6. Which gate is used to invert the input signal?

- a) AND gate
- b) OR gate
- c) NOT gate
- d) NAND gate

# 7. Which of the following flip-flops is a combination of SR and D flip-flop?

- a) T flip-flop
- b) JK flip-flop

- c) SR flip-flop
- d) D flip-flop

### 8. Which digital circuit is used to add two binary digits?

- a) Half Adder
- b) Full Adder
- c) Flip-flop
- d) Encoder

## 9. Which Boolean theorem is used to simplify (A + A') = 1?

- a) Idempotent Law
- b) Complement Law
- c) Distributive Law
- d) Associative Law

## 10. The primary function of an OR gate is to:

- a) Output true if both inputs are true
- b) Output true if any input is true
- c) Output false if both inputs are true
- d) Output false if any input is true

# 11. A JK flip-flop is characterized by:

- a) A toggle mode when both inputs are high
- b) An output that always follows the input
- c) A clock input only
- d) A priority input

### 12. In a half adder, what is the output when inputs A = 1 and B = 1?

- a) Sum = 0, Carry = 1
- b) Sum = 1, Carry = 1
- c) Sum = 1, Carry = 0
- d) Sum = 0, Carry = 0

### 13. Which logic gate is used to implement the Boolean expression A + B?

- a) AND gate
- b) OR gate
- c) NOT gate
- d) XOR gate

### 14. A flip-flop is used to:

- a) Store binary data
- b) Perform binary addition

- c) Convert analog signals to digital
- d) Increase signal strength

## 15. What does the "clock" in a flip-flop do?

- a) Controls the timing of the output
- b) Controls the input signal
- c) Increases voltage
- d) Amplifies the signal

## 16. What is the main difference between an SR flip-flop and a JK flip-flop?

- a) JK flip-flop has no undefined state
- b) SR flip-flop has a clock input
- c) JK flip-flop can only be reset
- d) SR flip-flop uses two inputs

## 17. A full adder adds:

- a) Two binary digits and a carry input
- b) Two binary digits only
- c) A binary digit and an XOR gate
- d) None of the above

# 18. What is the function of a multiplexer?

- a) Select one of many inputs to pass to the output
- b) Store a single bit of data
- c) Perform binary addition
- d) Invert input signals

### 19. What is the result of the Boolean operation A + A'B?

- a) A + B
- b) A
- c) A'B
- d) None of the above

### 20. Which logic gate is the basic building block of a flip-flop?

- a) AND gate
- b) NOR gate
- c) XOR gate
- d) NAND gate