- 1. What are the advantages of integrated circuits (ICs)?
- a) Low cost and small size
- b) Reduced power consumption
- c) Increased reliability and ruggedness
- d) All of the above

Answer: d) All of the above

Explanation: Integrated circuits offer advantages such as low cost due to mass production, compact size, reduced power consumption, and improved reliability compared to discrete components.

- 2. Which of the following is not a characteristic parameter of integrated circuits (ICs)?
- a) Power dissipation
- b) Operating temperature range
- c) Maximum clock frequency
- d) Voltage gain

Answer: d) Voltage gain

Explanation: Voltage gain is a characteristic of specific components like amplifiers, not integrated circuits as a whole.

- 3. What is the basic building component of integrated circuits?
- a) Transistor
- b) Resistor
- c) Capacitor
- d) Diode

Answer: a) Transistor

Explanation: Transistors are the fundamental building blocks of integrated circuits, used for various functions such as amplification and switching.

- 4. Which of the following configurations does not belong to operational amplifiers (op-amps)?
- a) Dual input balanced output differential amplifier
- b) Dual input unbalanced output differential amplifier
- c) Single input balanced output differential amplifier
- d) Single input unbalanced output differential amplifier

Answer: c) Single input balanced output differential amplifier

Explanation: Operational amplifiers typically involve configurations with dual inputs and either balanced or unbalanced outputs.

- 5. What is the block diagram of an operational amplifier (op-amp) composed of?
- a) Resistors and capacitors
- b) Transistors and diodes
- c) Voltage sources and amplifiers
- d) Differential input stage, gain stage, and output stage

Answer: d) Differential input stage, gain stage, and output stage

Explanation: The block diagram of an op-amp typically includes these three stages: a differential input stage, a gain stage, and an output stage.

- 6. Which of the following is a characteristic of an ideal operational amplifier (op-amp)?
- a) Infinite input impedance
- b) Zero output impedance
- c) Infinite bandwidth
- d) All of the above

Answer: d) All of the above

Explanation: Ideal op-amps are assumed to have infinite input impedance, zero output impedance, and infinite bandwidth in theoretical analysis.

- 7. What is the primary function of the power supply configurations for op-amps?
- a) Provide a stable operating voltage
- b) Amplify the input signal
- c) Control the gain
- d) Set the bandwidth

Answer: a) Provide a stable operating voltage

Explanation: Power supply configurations for op-amps ensure a stable and appropriate operating voltage to enable proper amplification of input signals.

- 8. Which type of differential amplifier is characterized by two inputs and two outputs that are both balanced?
- a) Dual input balanced output differential amplifier
- b) Dual input unbalanced output differential amplifier
- c) Single input balanced output differential amplifier
- d) Single input unbalanced output differential amplifier

Answer: a) Dual input balanced output differential amplifier

Explanation: In a dual input balanced output differential amplifier, both inputs are utilized, and both outputs are balanced.

- 9. In which configuration does an operational amplifier (op-amp) have a single input and an unbalanced output?
- a) Dual input balanced output differential amplifier
- b) Dual input unbalanced output differential amplifier
- c) Single input balanced output differential amplifier
- d) Single input unbalanced output differential amplifier

Answer: d) Single input unbalanced output differential amplifier

Explanation: This configuration involves a single input and an unbalanced output.

- 10. What is the purpose of differential amplification in operational amplifiers (op-amps)?
- a) To amplify the difference between two input voltages
- b) To amplify the sum of two input voltages
- c) To invert the input signal
- d) To provide high impedance at the input

Answer: a) To amplify the difference between two input voltages

Explanation: Differential amplification in op-amps amplifies the voltage difference between the two input terminals while rejecting common-mode signals.