

# Introduction to Quantum Computing Components and Concepts

Computer Science · Answer Key · 10 Questions

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## 1. What is the primary function of quantum gates in quantum computing?

- A) To store classical bits
- B) To manipulate the states of qubits**
- C) To perform arithmetic operations
- D) To connect quantum processors

## 2. Which quantum gate is used to create superposition?

- A) Pauli-X gate
- B) CNOT gate
- C) Hadamard gate**
- D) Classical NOT gate

## 3. The Pauli-X gate is analogous to which classical gate?

- A) AND gate
- B) OR gate
- C) XOR gate
- D) NOT gate**

## 4. What is the purpose of a CNOT gate?

- A) To create entanglement**
- B) To flip a single qubit's state
- C) To induce superposition
- D) To measure a qubit

## 5. What is a quantum circuit composed of?

- A) A series of classical logic gates
- B) A single qubit
- C) A series of quantum gates**
- D) A database

## 6. What is the output of a quantum circuit?

- A) The input data
- B) The result of a quantum operation**
- C) The physical qubits
- D) The classical computation steps

**7. Which quantum algorithm is known for efficiently factoring large numbers?**

- A) Grover's Algorithm
- B) Shor's Algorithm**
- C) Deutsch-Jozsa Algorithm
- D) Quantum Fourier Transform

**8. What impact does Shor's Algorithm have?**

- A) Speeds up database searches
- B) Enhances encryption**
- C) Solves linear equations
- D) Simulates molecular interactions

**9. Grover's Algorithm provides a speedup for what type of task?**

- A) Factoring large numbers
- B) Searching in unsorted databases**
- C) Solving optimization problems
- D) Simulating quantum systems

**10. Quantum computing offers a speedup for specific problems compared to classical computers. This is known as:**

- A) Quantum Entanglement
- B) Quantum Superposition
- C) Quantum Speedup**
- D) Quantum Tunneling