

Name _____

Quantum Algorithms: Unleashing the Power of Quantum Computing

Short Answer Key

1. Quantum algorithms differ from classical algorithms in their ability to explore multiple solutions to a problem simultaneously. This is made possible by the property of qubits known as superposition, allowing them to represent multiple states at once.
2. Superposition is the quantum property that allows qubits to exist in multiple states simultaneously. In quantum algorithms, it is harnessed to explore multiple possible solutions to a problem at once, which can lead to exponential speedup in certain computations.
3. An example of a problem well-suited for quantum algorithms is factoring large numbers. This problem is challenging for classical computers but can be solved exponentially faster using algorithms like Shor's algorithm.
4. Quantum algorithms face challenges related to the delicate nature of quantum states. Maintaining qubits' coherence is difficult, and quantum algorithms are not superior for all types of problems; they excel primarily in specific domains where quantum properties can provide a computational advantage.
5. Quantum algorithms are making a significant impact in drug discovery. They can simulate molecular interactions more efficiently than classical computers, leading to the discovery of new drugs and materials.

