Homework Quiz - Week 17 Results for Murshed SK

Correct answers are hidden.

Score for this attempt: 10 out of 10
Submitted Mar 1 at 5:17am
This attempt took less than 1 minute.

Question 1
1 / 1 pts

Which of the following best describes why noisy simulations are important in quantum computing? Because…

- (selected) Understanding noise through simulations can help us understand how to combat it in real devices.
- Adding noise can speed up simulations.
- It introduces a fun element to our simulations.
- We do not have real quantum devices to use yet.
- The unpredictability can lead to results we could not have otherwise achieved.

Question 2
1 / 1 pts

Which qubit type has not been fully realized experimentally yet, but is being explored for its natural ability to combat noise more effectively than the rest.

- Superconducting qubits
- Trapped ion qubits
- Photonic qubits
- (selected) Topological qubits
- Neutral atom qubits

Question 3
1 / 1 pts

Which quantum hardware platform is known for its use of Josephson junctions?

- (selected) Superconducting qubits
- Trapped ion qubits
- Photonic qubits
- Topological qubits

Neutral atom qubits

Question 4

1 / 1 pts

In Problems #1.4 - 1.6, you apply different types of noise throughout the whole circuit preparing the GHZ state. Which of the 3 types of noise models used has the least effect on the measurement outcomes.

- Depolarization
- Phase Flip
- Amplitude Damping
- All three have the same effect
- None of these errors affect the state since it is entangled

Question 5

1 / 1 pts

In Problems #1.7 - 1.10, you apply the same noise to different points in the circuit preparing the GHZ state. Which of the following best describes the results?

- The effect of the noise is the same in all cases since the noise model is the same.
- The earlier noise is applied, the more it affects the results because it introduces errors earlier.
- The later noise is applied, the more it affects the results because it introduces errors closer to measurement.
- The later noise is applied, the more it affects the results because as the qubits become entangled they change from the 0 state, which is unaffected by amplitude damping.
- From Problem #1.7 to 1.8, the probability of measuring 000 should decrease.

Question 6

1 / 1 pts

How does the introduction of noise affect entanglement?

- It always increases the degree of entanglement.
- It has no impact on entanglement.
- It can degrade or destroy entanglement.
- It converts entanglement into classical correlations.
- It changes the type of entanglement.

Question 7

1 / 1 pts

Imagine you measure the fidelity between a noisy and ideal version of a circuit to be 0.8. If you increase the probability of noise and change nothing else, how would you expect the fidelity to change? The fidelity will…

- Decrease because there is more noise causing the states to become more different.
- Increase because the probability increases.
- Become 0 because the noise will be too much.
- Be random and not comparable.
- Stay the same since the circuits and type of noise are the same.

Question 8

1 / 1 pts

What will be the final state after applying the controlled swap gate with q_0 as the control to this state, $|q_0q_1q_2\rangle = 0.6|110\rangle + 0.8|101\rangle$?

a. $0.6|010\rangle + 0.8|101\rangle$

b. $0.6|101\rangle + 0.8|010\rangle$

c. $0.6|010\rangle + 0.8|101\rangle$

d. $0.6|101\rangle + 0.8|110\rangle$

e. $0.6|111\rangle + 0.8|000\rangle$

- A
- B
- C
- D
- E

Question 9

1 / 1 pts

Which of the following best describes the results of Problem #2.1?

- The theoretical values are exactly right in every single case.
- The theoretical values are completely different in every single case.

The fidelity changes the same as the probability of amplitude damping increases from 0 to 0.1 as it does from 0.9 to 1.

The fidelity is always greater than or equal to 0.5 because amplitude damping causes a collapse to the 0 state, which is still 50% of the ideal plus state.

The fidelity quickly drops below 0.5 because amplitude damping causes many errors.

Question 10

1 / 1 pts

Which of the following best describes the results of Problem #2.2? Adding noise to the whole circuit causes…

The fidelity to drop at first, but then increase to 1 because simulations are not perfect reflections of reality.

The fidelity to drop at first, but then increase to 1 because amplitude damping causes all the qubits to collapse to 0 meaning the states will be the same.

An increasingly lower fidelity in every case because there is more noise overall.

No changes compared to the results in Problem #2.1 because it is the same noise model.

The fidelity to drop to 0 for all cases because amplitude damping can now effect the whole circuit.

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