Homework Quiz - Week 21 Results for Murshed SK

Score for this attempt: 10 out of 10
Submitted Mar 30 at 10:11am
This attempt took 4 minutes.

Question 1
1 / 1 pts

Complete the sentence: “A quantum network is a system in which quantum processors _____.”

- Can communicate with classical processors.

Correct!

- Can communicate with each other.
- Solve networking problems.
- Can grow their relationships for business purposes.
- Are distributed throughout a classical network.

Question 2
1 / 1 pts

How many qubits are typically required for meaningful quantum protocols?

- 1

Correct!

- < 10
- 10 - 100
- 100 - 1,000,000
- 1,000,000 - 1,000,000,000,000

Question 3
1 / 1 pts

Which of the following is not a key component of quantum networks?

- End nodes
- Classical communication lines
- Quantum communication lines
- Quantum repeater

Correct!

- Quantum swapper

Question 4

1 / 1 pts

What does the entanglement swapping protocol most directly achieve?

Correct!

- (selected) Doubling the maximum distance over which entanglement can be shared.
- Securely transmitting messages even if Eve intrudes.
- Sending a quantum state without physically sending qubits.
- Sending two classical bits using one qubit.
- Producing a high amount of entanglement in two qubits from many lightly entangled qubits.

Question 5

1 / 1 pts

Which of the following best describes the potential hardware for a quantum network?

- For all components to work together, the hardware must be of the same kind, such as photons.
- We have no idea what hardware could be used for networking. This is one of the main challenges in this field.

Correct!

- (selected)

The components may be made of different hardware types, but they need to be able to interface (communicate) with each other.

- It will definitely be based on photons and fiber optic cables.
- It will definitely be based on NV centers.

Question 6

1 / 1 pts

Complete the sentence: “Currently, there are quantum networks _____.”

- Only in theory
- Only in the US
- Only in China
- Only in Europe

Correct!

- (selected) In many locations

Question 7

1 / 1 pts

Which of the following best describes the current state of quantum network developments?

Correct!

While physical networks exist, they are mostly proof of principle. There is a lot of work to be done before we will be using quantum networks in everyday life.

- Work on building the first physical networks is just beginning.
- We are already using quantum networks in everyday life, but often don't realize it!
- It is unclear if quantum networking will be physically realizable.
- Quantum networks have begun to replace classical networks in some places.

Question 8
1 / 1 pts

Which of the following is not likely to be a way we will tackle technological challenges in quantum networking?

Correct!

- Entanglement Dilution
- Entanglement Distillation
- Entanglement Swapping
- Improving communication lines
- Error Correction

Question 9
1 / 1 pts

How many qubits were required in the implementation of Entanglement Swapping that we explored in lab?

- 2 - one for Alice and one for Bob.
- 3 - one for Alice, one for the Repeater, and one for Bob.

Correct!

- 4 - two for Alice & the Repeater to share and two for Bob & the Repeater to share.
- 5 - two for Alice, one for the Repeater, and two for Bob.
- 6 - two for Alice, two for the Repeater, and two for Bob.

Question 10
1 / 1 pts

If you have communication lines that can send qubits a maximum of 10 km and 4 quantum repeaters, how far apart can Alice and Bob be while still communicating? (This is a tricky question, we recommend drawing it out!)

a. 10 km
b. 14 km
c. 40 km
d. 50 km
e. 10^4 km

- A
- B
- C

Correct!

- D
- E

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