Quiz - Introduction to Complex Numbers II Results for SevdanurGenc

Correct answers are hidden.

Score for this attempt: **16** out of 20

Submitted Jun 10 at 10:24am

This attempt took 2 minutes.

Unanswered

Question 1

0 / 2 pts

[C04-01] What should be "your code here" so that the resulting quantum state is $i|10\rangle$?

```
from qiskit import QuantumRegister, ClassicalRegister, QuantumCircuit, execute, Aer

mycircuit = QuantumCircuit(2,2)

# Your code here
```

Question 2

2 / 2 pts

[C04-02] Fill the blanks so that the after applying the operations the resulting quantum state is $\frac{1}{\sqrt{2}}|0\rangle - i\frac{1}{\sqrt{2}}|1\rangle$.

```
from qiskit import QuantumRegister, ClassicalRegister, QuantumCircuit, execute, Aer

mycircuit = QuantumCircuit(1,1)

mycircuit._(0)

mycircuit._(0)

mycircuit._(0)
```

Write your answer in the following format

h, s, t

You can use the following gates: x,h,s,t,z

h, s, z

Question 3

2 / 2 pts

[C04-03] Suppose we have a single qubit. After applying which one of the following gates, the measurement output will be $|0\rangle$?

- [x] S
- [ ] H.TDG.H
- [ ] H.S.H
- [x] H.S.S.S.S.H
- [x] T
- [x] H.S.SDG.H

Question 4

2 / 2 pts

[C05-02] Which states are equivalent to the state $|\psi\rangle = \cos\frac{\pi}{3}|0\rangle + e^{i\pi}\sin\frac{\pi}{3}|1\rangle$ from the physical point of view (i.e., are equal up to a global phase)?

- [ ] $\cos\frac{\pi}{3}|0\rangle + e^{i\frac{\pi}{2}}\sin\frac{\pi}{3}|1\rangle$
- [ ] $\cos\frac{\pi}{6}|0\rangle + e^{i\pi}\sin\frac{\pi}{6}|1\rangle$
- [x] $-\cos\frac{\pi}{3}|0\rangle - e^{i\pi}\sin\frac{\pi}{3}|1\rangle$
- [x] $e^{i\frac{\pi}{2}}\cos\frac{\pi}{3}|0\rangle + e^{i\frac{3\pi}{2}}\sin\frac{\pi}{3}|1\rangle$

Question 5

1 / 1 pts

[C05-01] What is the probability to observe state $|0\rangle$ when we measure the following quantum state: $|\psi\rangle = \cos\frac{\pi}{4}|0\rangle + e^{i\pi}\sin\frac{\pi}{4}|1\rangle$

0.5

Question 6

2 / 2 pts

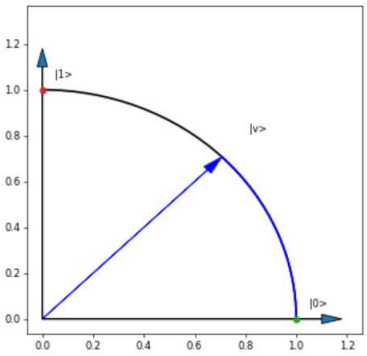
[C06-01] Which of the states corresponds to the following state: $|\psi\rangle = \frac{\sqrt{3}}{2}|0\rangle - \frac{i}{2}|1\rangle$?

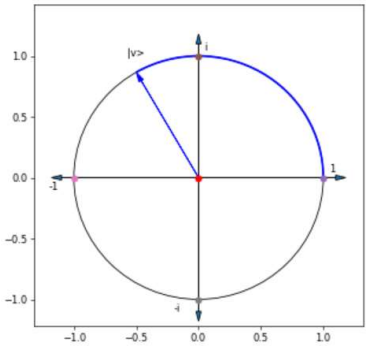
- $\cos\frac{\pi}{6}|0\rangle + e^{i\frac{3\pi}{2}}\sin\frac{\pi}{6}|1\rangle$
- $\cos\frac{\pi}{6}|0\rangle + e^{i\frac{\pi}{2}}\sin\frac{\pi}{6}|1\rangle$
- $\cos\frac{\pi}{3}|0\rangle + e^{i\frac{\pi}{2}}\sin\frac{\pi}{3}|1\rangle$
- $\cos\frac{\pi}{3}|0\rangle + e^{i\frac{3\pi}{2}}\sin\frac{\pi}{3}|1\rangle$

Question 7

2 / 2 pts

[C06-02] Which of the states is demonstrated on the following images:





?

$\cos\frac{\pi}{4}|0\rangle + e^{i\frac{2\pi}{3}}\sin\frac{\pi}{4}|1\rangle$

$\cos\frac{\pi}{4}|0\rangle + e^{i\frac{\pi}{3}}\sin\frac{\pi}{4}|1\rangle$

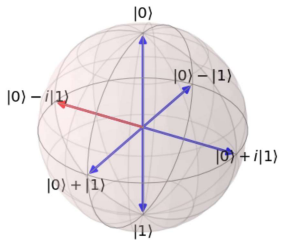
$\cos\frac{\pi}{2}|0\rangle + e^{i\frac{3\pi}{4}}\sin\frac{\pi}{2}|1\rangle$

$\cos\frac{\pi}{8}|0\rangle + e^{i\frac{\pi}{3}}\sin\frac{\pi}{8}|1\rangle$

Question 8

1 / 1 pts

[C07-01] Which state is depicted on the following Bloch sphere?



$\cos\frac{\pi}{4}|0\rangle + e^{i\frac{3\pi}{2}}\sin\frac{\pi}{4}|1\rangle$

$\cos\frac{\pi}{4}|0\rangle + e^{i\frac{2\pi}{3}}\sin\frac{\pi}{4}|1\rangle$

$\cos\frac{\pi}{8}|0\rangle + e^{i\frac{\pi}{3}}\sin\frac{\pi}{8}|1\rangle$

$\cos\frac{\pi}{2}|0\rangle + e^{i\frac{2\pi}{3}}\sin\frac{\pi}{2}|1\rangle$

Question 9

2 / 2 pts

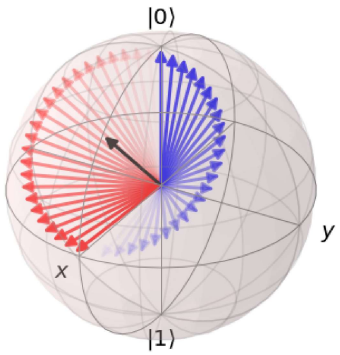
[C08-01] Gates X, Y and Z perform rotations on a Bloch sphere around x-, y- and z- axis, respectively. By which angle are these rotations performed?

- $\frac{\pi}{2}$
- 2π
- π
- $\frac{3\pi}{2}$

Question 10

2 / 2 pts

[C08-03] Here is the rotation axis of Hadamard operator. Which state will not change after applying the Hadamard operator?



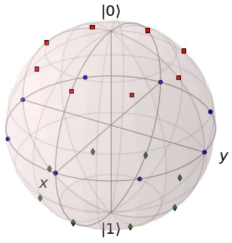
- $\frac{\sqrt{3}}{2}|0\rangle + \frac{1}{2}|1\rangle$
- $\frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$
- $\cos\frac{\pi}{4}|0\rangle + \sin\frac{\pi}{4}|1\rangle$
- $\cos\frac{\pi}{8}|0\rangle + \sin\frac{\pi}{8}|1\rangle$

Incorrect

Question 11

0 / 2 pts

[C08-02] Suppose that we begin from the state $|1\rangle$. Which gates allow us to reach all the states depicted on the following Bloch sphere?



- [x] H,T
- [ ] H,Z
- [x] Z,X
- [x] S,Y
- [x] RZ,H
- [ ] T,Z

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