

IBM C1000-112

Fundamentals of Quantum Computation Using Qiskit v0.2X Developer

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Question: 1

Which of the following bloch_multivector plot options given below is the correct one for the given bell quantum circuit?

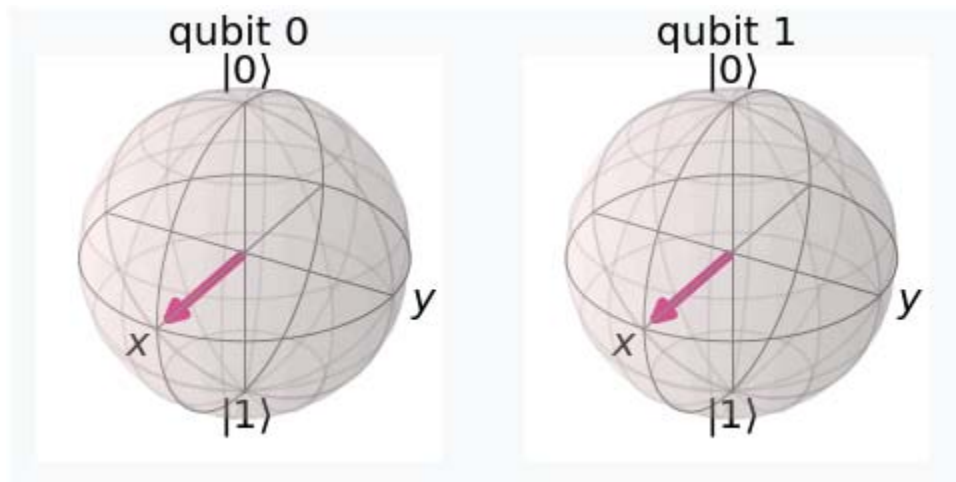
```
bell = QuantumCircuit(2)
```

```
bell.h(0)
```

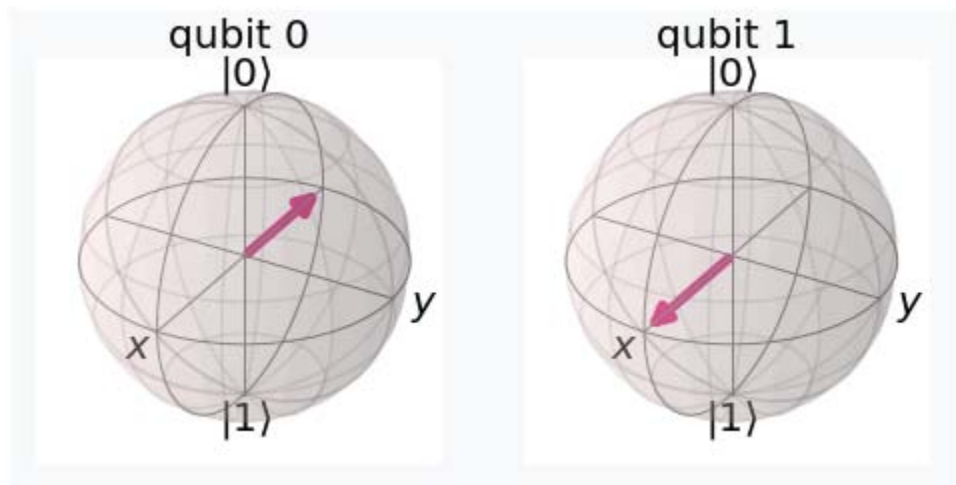
```
bell.cx(0,1)
```

Response:

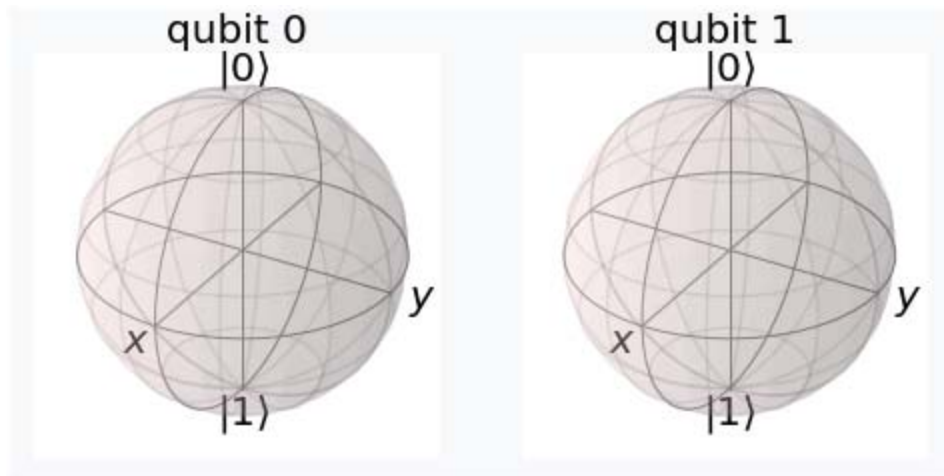
A.



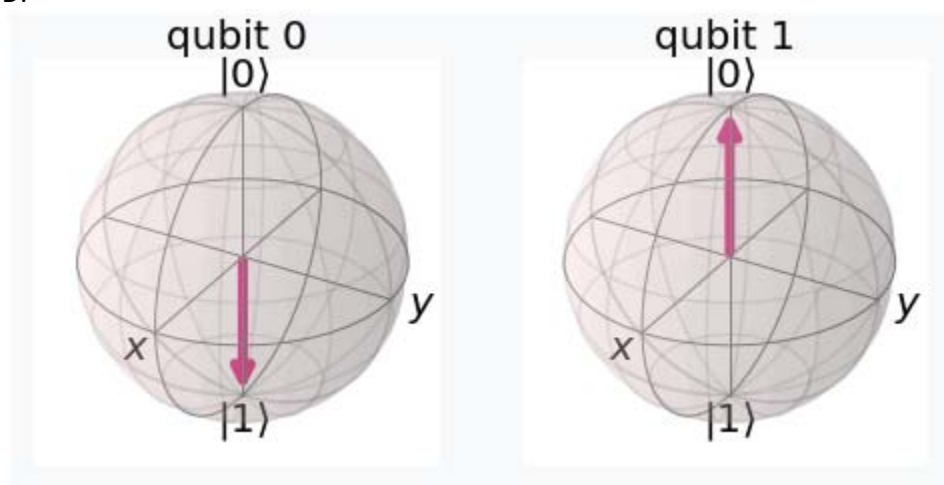
B.



C.



D.



Answer: C

Question: 2

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

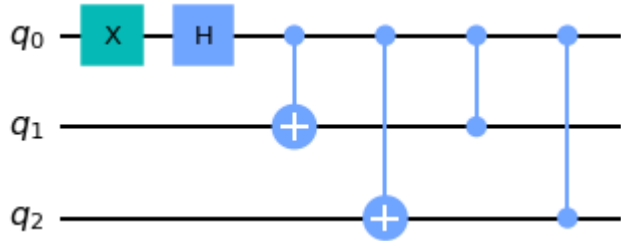
Response:

- A. π
- B. $\pi/4$
- C. $3\pi/4$
- D. $\pi/8$

Answer: A

Question: 3

What is the depth of the below quantum circuit?



Response:

- A. 4
- B. 5
- C. 6
- D. 3

Answer: C

Question: 4

which of the following simulator can be as good as real IBM Quantum computer?

Response:

- A. qasm_simulator
- B. real_quantum_simulator
- C. statevector_simulator
- D. unitary_simulator

Answer: A

Question: 5

What is the output of the given state in qiskit after applying CNOT to it?

$$\frac{1}{\sqrt{2}}|00\rangle + \frac{1}{2}|10\rangle - \frac{1}{2}|11\rangle$$

Response:

- A. $\frac{1}{\sqrt{2}}|00\rangle + \frac{1}{2}|11\rangle - \frac{1}{2}|10\rangle$
- B. $\frac{1}{\sqrt{2}}|00\rangle + \frac{1}{2}|10\rangle - \frac{1}{2}|11\rangle$
- C. $\frac{1}{\sqrt{2}}|01\rangle + \frac{1}{2}|01\rangle - \frac{1}{2}|11\rangle$

D. $\frac{1}{\sqrt{2}}|00\rangle$

Answer: A

Question: 6

which of the following quantum circuits will produce a bell state (maximum entangled state)?
(select any 3)

Response:

A.

```
bell= QuantumCircuit(2)
bell.h(0)
bell.cx(0,1)
```

B.

```
bell= QuantumCircuit(2)
bell.h(0)
bell.x(1)
bell.cx(0,1)
```

C.

```
bell= QuantumCircuit(2)
bell.h(0)
bell.x(1)
bell.cx(0,1)
bell.z(1)
```

D.

```
bell= QuantumCircuit(2)
bell.h(0)
bell.h(1)
bell.cx(0,1)
```

E.

```
bell= QuantumCircuit(2)
bell.h(0)
bell.x(1)
bell.h(1)
bell.cx(0,1)
```

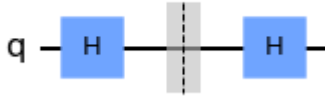
F.

```
bell= QuantumCircuit(2)
bell.x(0)
bell.cx(0,1)
```

Answer: ABC

Question: 7

What is barrier instruction between the H-gates in the below quantum circuit do?



Response:

- A. It joins both H-gates and executes them.
- B. It won't simplify the circuit between the two H-gates
- C. It is used for better circuit visualization
- D. It is used for circuit optimization

Answer: B

Question: 8

Given the following code, what is the depth of the circuit?

```
qc = QuantumCircuit(2, 2)
qc.h(0)
qc.barrier(0)
qc.cx(0,1)
qc.barrier([0,1])
```

Response:

- A. 2
- B. 3
- C. 4
- D. 5

Answer: A

Question: 9

Which statement continues parsing filename as if the contents of the file were inserted at the location of the statement?

Response:

- A. statement: begin "filename";

- B. statement: include "filename";
- C. statement: qasm_parser "filename";
- D. statement: compile "filename";

Answer: B

Question: 10

Which two options would place a barrier across all qubits to the QuantumCircuit below?

qc = QuantumCircuit(3,3)

Response:

- A. qc.barrier(qc)
- B. qc.barrier([0,1,2])
- C. qc.barrier()
- D. qc.barrier(3)
- E. qc.barrier_all()

Answer: BC

Question: 11

Which of the following statement prints the qiskit version?

Response:

A.

```
import qiskit
print(qiskit.__version__)
```

B.

```
import qiskit
print(qiskit.__qiskit_version__)
```

C.

```
import qiskit
print(qiskit.version())
```

D.

```
import qiskit
print(qiskit_version_display())
```

Answer: B

Question: 12

What is the output of the below snippet?

```
a = 1/np.sqrt(2)
desired_state = [a,np.sqrt(1-a**2)]
qc = QuantumCircuit(1)
qc.initialize(desired_state,0)
back_sv = BasicAer.get_backend('statevector_simulator')
result = execute(qc, back_sv).result()
qc_sv = result.get_statevector(qc)
state_fidelity(desired_state, qc_sv)
Response:
```

- A. 0.5
- B. Error in executing state_fidelity
- C. 0
- D. 1.0

Answer: D

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