✗ *

0/1

A unitary operator $\hat{U}$ is defined by

(a) $\hat{U} = \hat{U}^{\dagger}$

(b) $\hat{U}^{-1} = \hat{U}^{*}$

(c) $\hat{U}^{-1} = \hat{U}^{\dagger}$

(d) $\hat{U}^{2} = \hat{U}$

- (a) ✗
- (b)
- (c)
- (d)

Correct answer

- (c)

✓ *

1/1

If the ket vectors $|a\rangle$ and $|b\rangle$ are in the same Hilbert space, then $|a\rangle\langle b|$ is

(a) a scalar
(b) a vector
(c) a matrix
(d) none of the above

- (a)
- (b)
- (c) ✓
- (d)

✗ *

0/1

For a single qubit system, the operator $\hat{A} = \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$ can be written as

(a) $|0\rangle\langle 1| + |1\rangle\langle 0|$

(b) $|0\rangle\langle 0| + |0\rangle\langle 1| - |1\rangle\langle 0| + |1\rangle\langle 1|$

(c) $|0\rangle\langle 0| - |1\rangle\langle 1|$

(d) $|0\rangle\langle 0| + |0\rangle\langle 1| + |1\rangle\langle 0| - |1\rangle\langle 1|$

- ( ) (a)
- (•) (b) ✗
- ( ) (c)
- ( ) (d)

Correct answer

- (•) (d)

✗ *

0/1

If $|\psi_1\rangle = a|0\rangle + b|1\rangle$ and $|\psi_2\rangle = c|0\rangle + d|1\rangle$, then $|\psi_1\rangle \otimes |\psi_2\rangle$ is

(a) $ac|00\rangle + ad|01\rangle + bc|10\rangle + bd|11\rangle$

(b) $ac|01\rangle + bc|10\rangle$

(c) $ac|00\rangle + bc|01\rangle + ad|10\rangle + bd|11\rangle$

(d) $ac|00\rangle + bd|11\rangle$

- ( ) (a)
- (•) (b) ✗
- ( ) (c)
- ( ) (d)

Correct answer

- (•) (a)

✗ *

0/1

If we measure the vector $|\Psi\rangle = a|0\rangle + b|1\rangle$ along the basis $|0\rangle$ then the probability will be

(a) a
(b) b
(c) $|a|^2$
(d) $|b|^2$

- ( ) (a)
- (◉) (b) ✗
- ( ) (c)
- ( ) (d)

Correct answer

- (◉) (c)

✗ *

0/1

Quantum computer is first proposed by
(a) David Deutsch
(b) Charles Babbage
(c) John Mauchly and J. Presper Eckert
(d) Richard Feynman

- ( ) (a)
- ( ) (b)
- (◉) (c) ✗
- ( ) (d)

Correct answer

- (◉) (d)

✗ *

0/1

A two-qubit vector is defined in a
(a) one-dimensional Hilbert space
(b) two-dimensional Hilbert space
(c) three-dimensional Hilbert space
(d) four-dimensional Hilbert space

- ○ (a)
- ◉ (b) ✗
- ○ (c)
- ○ (d)

Correct answer

- ◉ (d)

✗ *

0/1

The Hadamard gate is a
(a) single qubit gate
(b) two qubit gate
(c) three qubit gate
(d) four qubit gate

- ○ (a)
- ○ (b)
- ◉ (c) ✗
- ○ (d)

Correct answer

- ◉ (a)

✗ *

0/1

CCNOT gate is a
(a) single qubit gate
(b) two qubit gate
(c) three qubit gate
(d) four qubit gate

- ○ (a)
- ◉ (b) ✗
- ○ (c)
- ○ (d)

Correct answer

- ◉ (c)