0/1

X

1/1

A unitary operator \hat{U} is defined by

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

X *

- (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)

✓ *

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

X

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)

X *

0/1

X

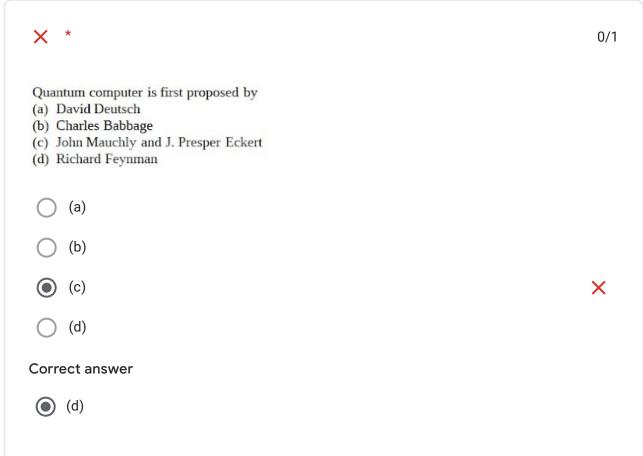
 $\text{If } \left|\psi_1\right>=a\big|0\right>+b\big|1\right> \quad \text{and} \quad \left|\psi_2\right>=c\big|0\right>+d\big|1\right>, \text{ then } \left|\psi_1\right>\otimes \left|\psi_2\right> \text{ is }$

- (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
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	
(a) single qubit gate (b) two qubit gate (c) three qubit gate	
(a) single qubit gate (b) two qubit gate (c) three qubit gate	
(a) single qubit gate (b) two qubit gate (c) three qubit gate	
(a) single qubit gate(b) two qubit gate(c) three qubit gate(d) four qubit gate	
(a)	×
(a) single qubit gate (b) two qubit gate (c) three qubit gate (d) four qubit gate (a) (b)	×
(a) single qubit gate (b) two qubit gate (c) three qubit gate (d) four qubit gate (a) (b) (c) (d)	×
(a) single qubit gate (b) two qubit gate (c) three qubit gate (d) four qubit gate (a) (b) (c)	×

!

× *	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)	

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