Quiz 2

Consider a two qubit state $|\psi >= \frac{1}{2}\begin{vmatrix} 1 \\ -1 \\ -1 \\ 1 \end{vmatrix}; \rho_A = Tr_B(|\psi >< \psi|); \rho_B = Tr_A(|\psi >< \psi|)$

Then

- a. $Tr(\rho_A log_2 \rho_A) = Tr(\rho_B log_2 \rho_B) = 0$
- b. None of the above
- c. $Tr(\rho_A log_2 \rho_A) = Tr(\rho_B log_2 \rho_B) = 1$
- d. $Tr(\rho_A log_2 \rho_A) = 0 \neq Tr(\rho_B log_2 \rho_B)$

Consider $P = \frac{1}{2}\Sigma_{i=0}^{n-1}\Sigma_{k=0,k\neq i}^{n-1}|\phi >< \phi|; where|\phi >= |ik > -|ki > and|ik >= |i > \otimes|k >$

then

- a. $P^2 = \frac{P}{2}$
- b. $P^* = -P$
- c. $P = -P^+$
- d. $P^2 = P$

Consider $\rho_w = r|\psi >< \psi| + \frac{1-r}{4}\mathbf{I}_4; |\psi >= \frac{1}{\sqrt{2}}(1,0,0,1)^T$ and

$\mathbf{I}_4$ =Identity matrix of 4 dimension. $0 \leq r \leq 1$.

ρ_w is entangled if

- a. $r > 0$
- b. $r > \frac{1}{3}$
- c. independent of r
- d. $r > \frac{1}{4}$

Consider the following operations:

$$\begin{vmatrix} \rho_{11} & \rho_{12} & \rho_{13} \\ \rho_{21} & \rho_{22} & \rho_{23} \\ \rho_{31} & \rho_{32} & \rho_{33} \end{vmatrix} \rightarrow \begin{vmatrix} \rho_{33} & \rho_{23} & \rho_{13} \\ \rho_{32} & \rho_{22} & \rho_{12} \\ \rho_{31} & \rho_{21} & \rho_{11} \end{vmatrix}$$

The operation is

- a. Not Hermitian
- b. Completely Positive
- c. Completely negative
- d. Positive not completely positive