QUIZ III

1. CTAB is

(i) anionic surfactant (ii) cationic surfactant (iii) neutral surfactant (iv) not a surfactant

2. Name the non-bonded interaction

(i) electrostatic (ii) hydrogen bond (iii) vander walls (iv) covalent

3. Hydrophobic protein has predominantly

(i) polar groups (ii) lipophilic groups (iii) hydrophilic groups (iv) charged groups

4. High molecular weight PEG

(i) will decrease partition coefficient (ii) will increase partition coefficient (iii) partition coefficient will remain same (iv) decrease partition coefficient

5. Increase in salt concentration in the bottom phase of two phase extraction (i) increases protein amount in upper phase (ii) decreases protein amount in upper phase (iii) protein amount in upper phase remains same (iv) protein gets deactivated

6. Negatively charged proteins partition to

(i) bottom phase (ii) upper phase (iii) interphase (iv) no effect

7. Aqueous two-phase extraction method is used to extract an enzyme. The partition coefficient is 3. Calculate the maximum possible enzyme recovery when the volume ratio of upper to lower phases is 2

(i) 80.5 % (ii) 85.7% (iii) 90.2 % (iv) 92.1%

8. If I want to increase the extraction efficiency to 95% in problem 7, what should be the volume ratio for same partition coefficient?

(i) 6.05 (ii) 7.35 (iii) 6.34 (iv) 6.77

9. In affinity partitioning if the protein that has to be extracted has 4 identical independent binding sites for the affinity ligand, how much ligand has to be added so that the partition coefficient is doubled? partition coefficient for the protein in the absence of ligand =4, dissociation constants of the protein ligand complex in the bottom and top phases = 2, 3. Partition coefficient of free ligand =2

(i) 1.355 (ii) 1.405 (iii) 1.475 (iv) 1.655

10. In Aqueous two-phase extraction, if partition coefficient = concentration of the protein in the top phase that in the bottom phase = 2 and if the total concentration of the protein is 4.5 mM, calculate the amount in the top phase.

(i) 2.5 (ii) 3.0 (iii) 3.5 (iv) 4.0

11. If the dialyzer clearance K_d,= 1 ml/min, the concentrations of urea in the blood entering is 0.1 mmoles/liter and if no blood fluids escapes, Calculate the concentrations of urea in the blood leaving the unit if the blood flow is 20 ml/min

(i) 0.002 (ii) 0.005 (iii) 0.05 (iv) 0.01

12. Fick's law of diffusion is given by permeation flux=

(i) $D\, dC/dx$ (ii) $-D\, dC/dx$ (iii) $-D\, d^2C/dx^2$ (iv) $D\, d^2C/dx^2$

13. In an MF if the Concentration at the wall is 63% more than the bulk , diffusion coefficient divided boundary layer thickness is = 0.0062 cm/sec, what is the velocity of flow (cm/sec)

(i) 0.03 (ii) 0.004 (iii) 0.002 (iv) 0.003

14. calculate the permeate flux through a NF membrane if the Membrane permeability = 0.1, 50% of the solids are rejected, driving force =10 bar, osmotic pressure = 5 bar.

(i) 1.0 (ii) 0.5 (iii) 0.75 (iv) 7.5