

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

[CO-3]

1. What do you understand by Adsorbent and Adsorbate? [2]
2. Differentiate between followings: [3]
  - a) Adsorption and Liquid-Liquid Extraction
  - b) Surface Filtration and Dead-end Filtration

[CO-4]

3.
  - a) How does the organic solvent cause the protein precipitation? What is the major concern with the organic solvents-induced precipitation? [2]
  - b) The aliphatic alcohols with ..... (increase/decrease) in chain length ..... (increase/decrease) the extent of protein denaturation. [1]
4.
  - a) Which mode of liquid-liquid extraction is more efficient: Co-Current, Counter-Current and Cross-Current. Justify for your answer. [2]
  - b) Which type of adsorption isotherm are followed by the adsorption of antibiotics, steroids onto commonly used adsorbents? [1]

[CO-5]

5. What do you understand by concentration polarization? How will it impact the ultrafiltration? How will you resolve the issue of concentration polarization? [3]
6.
  - a) Draw a diagrammatic representation of basic steps involved in a liquid-liquid extraction. [2]
  - b) In aqueous two-phase extraction, if partition coefficient =2, and if the total concentration of the protein is 3.0 mM in 350 L, calculate the concentration in the top phase if the extraction efficiency is 90% and volume of liquid in the lower phase is 100 L. [2]

7. What are the five major steps involved in any adsorption process? [2]
8. a) In which scenarios is electro dialysis commonly employed? [2]  
b) Whether using nanofiltration before microfiltration is better? Justify your answer. [2]
9. If 95% of the product is removed from a broth containing 200 kg of it using a downstream process. How much of the product get lost in Kgs? [1]

UNIT TEST 2 EVALUATION APR 2024