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**Sardar Patel University**  
**M. Sc. Integrated Biotechnology, Ten Semester Examination**  
**Thursday, 23-04-2015**  
**PS10CIGIB2: Downstream Processing**

TIME: 10:30 am to 1:30 pm

Marks: 70

Q.1

Attempt the followings

08

- 1 The choice of filtration process is based on
  - a. Properties of solids
  - b. Mode of operation
  - c. Solid to liquid ratio
  - d. Temperature
- 2 Precipitation is advantageous because it gives
  - a. Purification
  - b. Recovery
  - c. Purification and recovery
  - d. Precipitates
- 3 Better cell disruption is achieved by
  - a. Agitation with abrasive
  - b. cocktail of enzyme
  - c. Ultrasonication
  - d. all of these
- 4 In gel filtration column, \_\_\_\_\_.
  - a. Molar protein enter the bead more readily
  - b. Larger protein elutes first Availability
  - c. a & b
  - d. None of these
- 5 Which of the technique is often considered a suitable "polishing" step in a protein purification strategy?
  - a. Affinity Chromatography
  - b. Ion-exchange chromatography
  - c. Hydrophobic Interaction Chromatography
  - d. Size-exclusion chromatography
- 6 To elute target proteins from an affinity chromatography matrix which of the following conditions would be the most appropriate
  - a. Low salt concentration
  - b. High salt concentration
  - c. adding a soluble ligand which competes with the affinity ligand for binding to the column
  - d. Just keep washing buffer through the column, isocratic column
- 7 In counter-current extractor, at low pH partition coefficient is in favour of \_\_\_\_\_ and at neutral pH, partition coefficient is in favour of \_\_\_\_\_.
  - a. Organic & aqueous
  - b. Organic & aqueous
  - c. Inorganic & aqueous
  - d. None
- 8 An isocratic illusion in HPLC is one in which composition of the solvent \_\_\_\_\_.
  - a. Remain Constant
  - b. Change in series of step
  - c. Change continuously
  - d. all of these

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- Q.2 Answer in brief (Any seven) 14
- 1 Write advantages of cross flow filtration.
  - 2 Describe blinding of filter membrane and role of filter aid with suitable example.
  - 3 Draw a labeled diagram of solid bowl scroll centrifuge.
  - 4 Enlist various combinations of hydrophilic polymers for two phase aqueous extraction system.
  - 5 Which kind of stationary phase is used in reverse phase chromatography & give suitable examples.
  - 6 What are the importance of spacer arm and ligand in terms of affinity chromatography.
  - 7 Which kind of dryers will be effective for drying of heat sensitive materials & why?
  - 8 Define : Throughput and Retention Time
  - 9 Draw labeled diagram of continuous distillation plant.
- Q.3 A Give an account on continuous filters. 06  
B Write a note on disc bowl centrifuge with suitable diagram 06  
OR  
B Write a note on: 06  
1) Tubular bowl centrifuge  
2) Scrapping mechanisms for rotary drum vacuum filter
- Q.4 A Write in detail about any two cell disruption methods based on shear. 06  
B Write an exhaustive note on super critical fluids. 06  
OR  
B Define liquid-liquid extraction. With suitable example explain centrifugal counter current solvent extraction. 06
- Q.5 A Discuss important variables in the choice of a column packing material in MSC. 06  
B Give an explanatory note on performance criteria of a gradient system of HPLC 06  
OR  
B Ion exchange chromatography is significant chromatography method in terms of protein purification : Justify 06
- Q.6 A Enlist the recovery methods of citric acid and write brief account on the solvent extraction recovery process of citric acid 06  
B Discuss types of electrodialysis process on the basis of their principle 06  
OR  
B Write a note on drying and crystallization. 06