



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 154701**

Roll No.

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**B. Tech.**

(SEM. VII) (ODD SEM.) THEORY  
EXAMINATION, 2014-15  
**DOWNSTREAM PROCESSING**

Time : 3 Hours]

[Total Marks : 100

**Note :** Attempt all questions.

- 1 Attempt any **Four** parts of the following : (4×5=20)
- (a) What is affinity chromatography ? Explain in detail.
  - (b) Differentiate between differential and density gradient centrifugation.
  - (c) Explain membrane based purification.
  - (d) Describe solid - liquid extraction process.
  - (e) What is zone spreading ? Explain in detail.
  - (f) What is the role of riboflavin and ammonium per sulphate in PAGE ?
- 2 Write short notes on any **four** : (4×5=20)
- (a) Purification Factor
  - (b) GLC
  - (c) Reverses Osmosis

- (d) Solvent recovery
- (e) Cost cutting strategies in DSP
- (f) Product Polishing.

**3** Attempt any **two** parts : **(2×10=20)**

- (a) What is Bio-separation ? Describe different methods of recovery of bio-molecules.
- (b) What is Adsorption ? What is Adsorption isotherm ? Explain different Adsorption processes used in industries.
- (c) Briefly discuss the various cell disruption method used in industry.

**4** Attempt any **two** parts : **(2×10=20)**

- (a) Describe the mechanism of ammonium sulphate precipitation method. Why this method is preferred for protein precipitation ?
- (b) Describe the principle and application of ion exchange chromatography.
- (c) What is the principle of crystallization ? Explain different types of nucleation processes.

**5** Attempt any **two** parts : **(2×10=20)**

- (a) What is electrophoresis ? Discuss the set-up of two-dimensional gel electrophoresis for product purification.
  - (b) What is the principle of chromatography technique ? Explain HPLC and techniques of chromatography.
  - (c) Discuss the steps involved in citric acid recovery and purification.
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