Code No: M2323/R07 **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
DOWNSTREAM PROCESSING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Outline the downstream processing steps in citric acid manufacture. [16]
2. Discuss the steps involved in the product isolation and purification of an extra cellular enzyme. [16]
3. (a) What are protein inclusion bodies? How are they converted to native proteins?
   (b) What is cell permeabilization? What is its use? [16]
4. Explain the theory and configuration of typical membrane separation equipment. What is its application in the product enrichment operation? Explain. [16]
5. Write in detail about the precipitation methods based on solvent property modification. [16]
6. What is a sequencing gel? How it is useful in the analysis of nucleic acids. [16]
7. Explain the principle of gas chromatography. Discuss the different components of gas chromatography instrument with a neat labeled diagram. [16]
8. Explain about the process of dialysis. [16]

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Code No: M2323/R07 **Set No. 2**

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
DOWNSTREAM PROCESSING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the different steps in the downstream processing of biochemical products? [16]

2. (a) Describe about the characterization in fermentation broths.
   (b) Mention various types of fermentation broths. [16]

3. Give an account on the working of a continuous rotary filter. [16]

4. (a) Derive the mathematical expression of Retention co-efficient or Rejection co-efficient for
   (b) What are the factors affecting the membrane separation process? Explain about them? [16]

5. Write about the principle and mechanism of precipitation of proteins by metal ions. What are the required precautions during the process for different biotechnological products. [16]

6. Write about eletro osmotic flow and pressure induced flow in capillary electrophoresis. [16]

7. Write short notes on:
   (a) Temperature programming in GC
   (b) Band separation
   (c) Electron capture detector
   (d) Open tubular columns. [4×4]

8. Write about the principle of dialysis. How it is different form ultra filtration. Write the significance of dialysis in product recovery. [16]

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Code No: M2323/R07 **Set No. 3**

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
DOWNSTREAM PROCESSING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss about the classical and modern biotechnology consideration of downstream processing in Biotech industry. [16]
2. (a) What are the parameters used in characterization in fermentation broth?
   (b) List down all the important impurities and containments present in DSP and their removal techniques. [16]
3. Give an account on the working of a continuous rotary filter. [16]
4. Write short notes on :
   (a) Liquid membranes
   (b) Ultra filtration. [16]
5. Write about the principle and the method of selective denaturation of proteins. [16]
6. Explain the various steps along with the principle of 2D-gel electrophoresis. [16]
7. (a) What was HEPT and total number of plates, if the electron peak was 10 m after sample injection with a width curve of 0.2 mt and column length of 20m?
   (b) Write about temperature programming if column is gas chromatography. [16]
8. (a) Write the concept of Dialysis
   (b) How to choose the dialysis membrane.
   (c) Write about the concentration changes of the macromolecule. [6+5+6]

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Code No: M2323/R07 **Set No. 4**

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
DOWNSTREAM PROCESSING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss about the Important steps involved in downstream processing for butanol production. [16]

2. Give an account of characteristics of Bio-separations and Broad strategies for design of Bio- Separations. [16]

3. Using a test filter, we find the following data for a broth containing the antibiotic erythromycin and added filter aid.

Filtration time (sec.)	5	10	20	30
Filtrate volume (lit.)	0.04	0.055	0.088	0.095

The filter leaf has a total area of 0.1 ft^2 and the filtrate has a viscosity of 1.1 cP. The pressure drop is 20 inches of mercury and the feed contains 0.015 kg dry cake per liter. Determine the specific cake resistance and medium resistance. [16]

4. Discuss about the multi-stage membrane separation with non ideal mixing. [16]

5. Write the principle and method of protein precipitation by ionic polyelectrolytes. List the commonly used ionic polyelectrolytes in the industry. [16]

6. Write short notes on
   (a) SDS-gel electrophoresis
   (b) Staining technoques for protein gels. [16]

7. Explain about paper chromatography. Write its advantages and disadvantages in process. Is the process suitable in product recovery? Justify your answer. [16]

8. Write the principle, flow scheme of a simple supercritical extraction system and its advantages and disadvantages. [16]

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