

Code No: 07A72304

R07**Set No. 2****IV B.Tech I Semester Examinations, NOVEMBER 2010****DOWNSTREAM PROCESSING****Bio-Technology****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Define pervaporation and a general scheme for the process and the factors influencing the process. [16]
2. (a) Write in detail about counter current extraction process.
(b) An aqueous solution contains 2% of a solute X which will be extracted in to an organic solvent at 25°C. Calculate the percent extraction of solute if 150kg of feed solution is extracted once with 250kg of solvent. [10+6]
3. Write short notes on:
(a) Capacity factor
(b) Relative retention
(c) Column efficiency
(d) Resolution. [4×4=16]
4. Write the main differences between preparative and analytical gel electrophoresis. [16]
5. What is filtration? With a neat sketch explain the working of a rotary drum filter. What is a pre coat filter? [16]
6. What is the role of process engineer in Bioseparation process? Explain in detail with help of suitable examples. [16]
7. Explain about the working principle and procedure of ultra filtration. [16]
8. Discuss the steps involved the product isolation and purification of an antibiotic production. [16]

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R07**Set No. 4**

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DOWNSTREAM PROCESSING

Bio-Technology

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. What are the stages involved in the recovery of intra cellular products? Explain with help of suitable unit operation involved in each stage. [16]
2. Write about the precipitation of proteins by addition of non-ionic polymers. List out the commonly used non-ionic polymers in the industry. [16]
3. What are the salient features, advantages and disadvantages of bioprocess compared to conventional chemical processes? [16]
4. Discuss about the basic principle of membrane separation and explain about different membrane configurations. [16]
5. Discuss the process of crystallization. What are the different parameters considered before crystallizing a compound? [16]
6. Write the principle, operation and advantages of using FPLC. How it is similar and different from HPLC application. [16]
7. (a) How is filtration time determined for continuous filtration of a broth?
(b) How is washing efficiency determined in rotary drum filtration? [16]
8. Write about electro osmotic flow and pressure induced flow in capillary electrophoresis. [16]

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R07**Set No. 1****IV B.Tech I Semester Examinations, NOVEMBER 2010****DOWNSTREAM PROCESSING****Bio-Technology****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Write in detail about recent and future developments in Bioseparations. [16]
2. Explain in detail about the working principle and procedure involved in reverse Osmosis? [16]
3. Write about the process advantages and industrial applications of integrated bio-processing. [16]
4. (a) Write about the sample injection systems commonly used in gas chromatography. [16]
 (b) Write about Gas Solid Chromatography. [16]
5. What is crystallization and how it is common and different from lyophilisation. [16]
6. (a) Write the principle of separation by capillary zone electrophoresis. [16]
 (b) A inorganic cation has an electrophoretic mobilities of $4 \times 10^{-4} \text{cm}^{-2} \text{s}^{-1} \text{V}^{-1}$. This same ion has diffusion coefficient of $10 \times 10^{-6} \text{cm}^2 \text{s}^{-1}$. If this ion is separated by capillary zone electrophoresis with 50cm capillary, calculate the expected plate count N at applied voltages of 10kv. [16]
7. Outline the downstream processing steps in gluconic acid manufacture. [16]
8. (a) Describe the basic principles of centrifugation. [16]
 (b) What is the capacity in cubic meters per hour of a clarifying centrifuge operating under the following conditions? [16]

Diameters of bowl	600 mm
Thickness of liquid layer	75 mm
Depth of bowl	400 mm
Speed	1200 r pm
Specific gravity of liquid	1.2
Specific gravity of Solid	1.6
Viscosity of liquid	2 CP
Cut size of particles	$30 \mu \text{m}$

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R07**Set No. 3**

IV B.Tech I Semester Examinations, NOVEMBER 2010

DOWNSTREAM PROCESSING

Bio-Technology

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the principle of extraction process. Describe about single stage and multi stage extraction methods. [16]
2. (a) Write the principle of molecular separation in a gel chromatography
(b) What was the volume occupies by stationary phase in Exclusion chromatography if Column had total volume of (V_t) 30 ml with volume of solvent in pores was (V_i) 10 ml and free external volume was 15 ml (V_0). [16]
3. Explain the various steps along with the principle of 2D-gel electrophoresis. [16]
4. Write the principle of supercritical fluid extraction, phase diagram and advantages of supercritical fluid extraction. [16]
5. Discuss about the single-stage membrane separation with ideal mixing. [16]
6. Discuss about the various unit operation techniques involved in downstream processing. [16]
7. (a) What are protein inclusion bodies? How are they converted to native proteins?
(b) What is cell permeabilization? What is its use? [16]
8. What are the major steps involved in the product isolation and purification of citric acid manufacturer? [16]
