Printed Page:- **Subject Code**:- **ABT0601**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2022-2023)

Subject: Bioseparation Engineering

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. Which is a reducing sugar? (CO1) 1

(a) Galactose

(b) Gluconic acid

(c) Sucrose

(d) β-methyl galactosidase

1-b. Which of the following is the reason for increased surface area for oxygen transfer in a spargerd bioreactor ? (CO1) 1

(a) Bubbles

(b) Turbidity

(c) Cells

(d) Protein

1-c. Which of the following colloids are solvent hating? (CO2) 1

(a) lyophilic

(b) lyophobic

(c) hydrophilic

(d) none of these

1-d. Which of the following is not an application of transport in membranes? (CO2) 1

(a) Microfiltration

(b) Reverse osmosis

(c) Dialysis

(d) Fractional distillation

1-e. The anticodon is a structure on (CO3) 1

(a) RNA

(b) ibosome

(c) mRNA

(d) tRNA

1-f. Which of the following materials are used for high temperature applications? (CO3) 1

(a) Polypropylene

(b) Cllulose acetate

(c) polylactic acid

(d) Ceramic

1-g. Which principle is behind filtration medium resistance? (CO4) 1

(a) Darcy's law

(b) Henry's law

(c) Dalton's law

(d) Newton's law

1-h. In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure? (CO4) 1

(a) Column chromatography

(b) Planar chromatography

(c) Liquid chromatography

(d) Gas chromatography

1-i. How to initiate crystallization? (CO5) 1

(a) Adding seed crystals

(b) Adjusting temperature

(c) Adjusting pressure

(d) Adjusting concentration

1-j. What are the factors that affect crystallization seedling? (CO5) 1

(a) Temperature and pressure

(b) Polymorphism of the crystals and pressure

(c) Crystal size distribution and temperature

(d) Crystal size distribution and polymorphism of the crystals

2. Attempt all parts:-

2.a. What are the 3 types of separation? (CO1) 2

2.b. What is the source of adsorption? (CO2) 2

2.c. What is the detergent method of cell disruption? (CO3) 2

2.d. What are chromatography results called? (CO4) 2

2.e. What are the impurities in recrystallization? (CO5) 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. Which small tube is used in centrifuge? (CO1) 6

3-b. What are the advantages of centrifuge? (CO1) 6

3-c. What are the applications of membrane separation? (CO2) 6

3-d. What are the two main factors that affect membrane structure? (CO2) 6

3.e. What is an example of physical cell disruption? (CO3) 6

3.f. What is the biochemical application of column chromatography? (CO4) 6

3.g. What are the important factors in crystallization? (CO5) 6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a. What factors does filtration depend on? (CO1) 10

4-b. What factors should be considered during cell disruption? (CO1) 10

5. Answer any <u>one</u> of the following:-

5-a. Which molecules would move farthest during gel electrophoresis and why? (CO2) 10

5-b. Why RNA extraction is comparetively difficult from DNA extraction? (CO2) 10

6. Answer any <u>one</u> of the following:-

6-a. What is the liquid shear method of cell disruption? (CO3) 10

6-b. State various filtration methods for the separation for solid liquid 10

separation. (CO3)

7. Answer any <u>one</u> of the following:-

7-a.	Define retention time and asymmetric peak in Chromatography? (CO4)	10
7-b.	Discuss various modes of separation of chromatography. Explain affinity chromatography with its industrial applications. (CO4)	10

8. Answer any <u>one</u> of the following:-

8-a.	Name the different steps involved in the process of crystallization. (CO5)	10
8-b.	Discuss the importance and methods of drying with suitable examples. (CO5)	10