

## **Downstream Processing (6th semester)**

### **chapter -1**

#### **Introduction**

##### **2 Marks**

1. Define downstream processing.
2. What is biomolecules?
3. What is drying?
4. What is flocculation?
5. Define flotation.
6. Write the types of cell disruption method.
7. What is formulation?
8. What is boiling point?
9. What is pervaporation?
10. Define perstraction.

##### **5 marks**

1. Draw the flow sheet of downstream processing.
2. Mention the characteristics of biomolecules.
3. Describe about drying.

##### **7 Marks**

1. Describe briefly about the cell-disruption methods.
2. Describe about the various separation process.
3. Describe about rotary drum vacuum filters with diagram.
4. Draw the diagram of membrane filters and describe about it.

### **chapter-2**

#### **Primary separation process**

##### **2 Marks**

1. what is introcellular Product?
2. Define extracellular product.
3. define Filtration.
4. What is centrifugation.
5. What do you mean by byproducts?
6. What is ultrasonication?

##### **5 Marks**

1. Describe about the various condition of broth.
2. Describe about physical method of cell Disruption.
3. Write the chemical method of cell Disruption.
4. Write the enzymatic methods of cell disruption.

**10 Marks**

1. Describe about the centrifugation method.
2. Describe about the filtration method.
3. Explain about rotary drum centrifugation with diagram.

### **Chapter-3**

#### **Product Isolation**

#### **2Marks**

1. What is adsorption?
2. What is dialysis?
3. Define electro dialysis.
4. What is ultra Filtration?
5. Define microfiltration.
6. define reverse osmosis.
7. What is precipitation?
8. What is perstraction?
9. What is pervaporation?

#### **5 Marks**

1. Describe about dialysis.
2. Give brief description about electro dialysis.
3. Write down about evaporation.
4. What is cell disruption method? Explain how osmosis help in cell disruption?
5. Explain the enzymatic method of cell disruption.

#### **10 marks**

1. Write the different methods of precipitation.
2. Describe about the liquid-liquid extraction.
3. Write about the membrane filtration.
4. What is separation technique? Explain any one method of solid liquid separation.

### **Chapter-4**

#### **Chromatography**

#### **2 Marks**

1. Define chromatography.
2. define HPLC?
3. What is FPLC?
4. What Is MS-LC?
5. Define Gas chromatography?

6. What is Ion-Exchange Chromatography?

7. What is affinity chromatography?

**5 Marks**

1. Describe about gel filtration chromatography.

2. Describe about ion-exchange chromatography.

3. Describe about affinity chromatography.

4. Write the principle of chromatography and two important stages involved in it?

**10 Marks**

1. Describe about HPLC and its principle.

2. Describe About FPLC with diagram.

3. Give details about MS-LC.

4. Write in Details about gas chromatography.

**Chapter-5  
Electrophoresis**

**2 Marks**

1. Define electrophoresis.

2. Define SDS.

3. What is SDS-PAGE?

4. Define isoelectric focusing.

5. Write down the name of basic support media used in electrophoresis.

6. What is EOF?

7. Formula of electrophoresis.

8. What is electrophoresis.

9. Types of electrophoresis.

10. Why are there two bands in gel electrophoresis ?

**5 Marks**

1. Write the principle of electrophoresis.

2. Describe about SDS-PAGE electrophoresis.

3. Describe about IEF.

**10 Marks**

1. Describe about continuous electrophoresis.

2. Describe about capillary electrophoresis.

3. Describe about 2D gel electrophoresis.

**Chapter-6**

1. Define crystallization.
2. Define drying.
3. What is lyophilisation.
4. What is formulation.
5. Define Distillation.
6. Write the uses of crystallization.
7. Does lyophilisation kill bacteria?
8. What is difference between freeze drying and lyophilisation ?

### **5 Marks**

1. Describe about drying.
2. Write about crystallization.
3. Explain about simple distillation with diagram.

### **10 Marks**

1. Define distillation. Write its principle and uses ?
2. Write about lyophilisation.
3. Define distillation? What are the three steps of distillation and write the principle of it.