

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR (GIET UNIVERSITY)



B. Tech (Seventh Semester) Examinations, November – 2024
21BCHPE47001 – Modern Separation Technique
(Chemical Engineering)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

- | | CO # | Blooms Level |
|--|------|--------------|
| a. Differentiate rate governed and equilibrium separation process. | CO1 | K2 |
| b. Write the basic principle of Micro filtration. | CO1 | K1 |
| c. What are the membrane separation processes for waste water treatment? | CO1 | K2 |
| d. Write the industrial applications of dialysis. | CO3 | K2 |
| e. Write the advantages of membrane separation process | CO1 | K1 |

PART – B**(15 x 4 = 60 Marks)**Answer **ALL** the questions

- | | Marks | CO # | Blooms Level |
|---|-------|------|--------------|
| 2. a. Discuss about the preparation of membrane using phase inversion method with neat diagram. | 8 | CO1 | K2 |
| b. Describe briefly about the advantages and disadvantages membrane separation process. | 7 | CO1 | K2 |
| (OR) | | | |
| c. Do the classification of membrane and briefly discuss about the different types of membranes | 8 | CO1 | K2 |
| d. What are the importance of cellulose acetate as material for preparation of membrane. | 7 | CO1 | K2 |
| 3.a. Explain about the basic principle and industrial application of Reverse Osmosis. | 8 | CO2 | K2 |
| b. Explain dialysis by taking example of hemodialysis with neat diagram. | 7 | CO2 | K2 |
| (OR) | | | |
| c. Derive the expression for modelling of solute transport in hemodialyser. | 8 | CO2 | K2 |
| d. Explain about the basic principle and industrial application of Nanofiltration. | 7 | CO2 | K2 |
| 4.a. What is zeta potential? Write its importance in separation process. | 8 | CO3 | K1 |
| b. Explain the role of ion exchange chromatography in separation process. | 7 | CO3 | K2 |
| (OR) | | | |
| c. Explain the process electrophoresis and its industrial application. | 8 | CO3 | K2 |
| d. Describe the electrodialysis process drawing a neat diagram.. | 7 | CO3 | K1 |
| 5.a. Explain the separation process in Emulsion Liquid Membrane drawing a diagram. | 8 | CO4 | K2 |
| b. Mention the advantages and disadvantages of liquid membrane. | 7 | CO4 | K1 |
| (OR) | | | |
| c. What are the factors affecting the performance of gas separation? | 8 | CO4 | K1 |
| d. What are the area of application of pervaporation? | 7 | CO4 | K2 |

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