| U.S.N. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

# B.M.S. College of Engineering, Bengaluru-560019

**Autonomous Institute Affiliated to VTU**

## January 2024 Semester End Main Examinations

**Programme: B.E.** **Semester: VII**
**Branch: Chemical Engineering** **Duration: 3 hrs.**
**Course Code: 19CH7DELE1** **Max Marks: 100**
**Course: Advances in Separation Techniques**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

| | | | CO | PO | Marks |
|---|---|---|---|---|---|
| | | **UNIT - I** | | | |
| 1 | a) | Explain in detail the following separations by phase addition or creation i) Flash vaporization ii) Distillation iii) Absorption iv) Liquid –Liquid extraction. | *CO1* | *PO1* | **12** |
| | b) | Discuss the factors that influence the selection of feasible separation operations. | *CO1* | *PO1* | **08** |
| | | **UNIT - II** | | | |
| 2 | a) | With a neat diagram explain the working of plate and frame, spiral wound membrane module. | *CO2* | *PO2* | **10** |
| | b) | Describe in brief about the mechanism of transport in porous membrane. | *CO2* | *PO2* | **10** |
| | | **OR** | | | |
| 3 | a) | Explain the process of reverse osmosis process with a schematic diagram and give its applications. | *CO2* | *PO2* | **12** |
| | b) | What is the principle involved in dialysis? Give any four commercial applications of dialysis. | *CO2* | *PO2* | **08** |
| | | **UNIT - III** | | | |
| 4 | a) | Mention the desirable properties to be possessed by a suitable adsorbent for commercial applications. List mostly commercially used adsorbents. | *CO3* | *PO6* | **10** |
| | b) | Explain the adsorption process with the aid of an industrial application. | *CO3* | *PO6* | **10** |
| | | **OR** | | | |
| 5 | a) | Discuss the classification of analytical chromatographic techniques. | *CO3* | *PO6* | **10** |
| | b) | Explain in detail the BET five types of adsorption isotherms. | *CO3* | *PO6* | **10** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | **UNIT - IV** | | | |
| | 6 | a) | Explain electrodialysis process with a schematic diagram and relevant reactions. | ***CO4*** | ***PO7*** | **10** |
| | | b) | What is the principle of electrophoresis? List the different modes of electrophoresis. | ***CO4*** | ***PO7*** | **05** |
| | | c) | List any five applications of electrodialysis. | ***CO4*** | ***PO7*** | **05** |
| | | | **UNIT - V** | | | |
| | 7 | a) | Explain the working principle of pervaporation process with a schematic diagram and give its applications. | ***CO5*** | ***PO7*** | **10** |
| | | b) | Explain supercritical fluid extraction with a phase diagram and mention the advantages of supercritical fluid. | ***CO5*** | ***PO7*** | **10** |

**********