

Time: 3 Hours

Marks: 80

1. Question 1 is compulsory.
2. Answer any Three questions from the remaining questions.
3. Right figures indicate full marks.
4. Assume suitable data if required.

Q 1: Answer any four of the following:

[20]

- a. Write short note on dialysis.
- b. Discuss adsorption properties of foam
- c. Explain retention time, retention volume and resolution in liquid chromatography
- d. Write note on membrane fouling
- e. Discuss adsorption breakthrough curve in detail

Q. 2:

- a. Discuss Pressure swing adsorption process using any example with a neat diagram. [10]
- b. What are the different equipments used for continuous adsorption. Discuss any one of them in detail. [10]

Q. 3:

- a. Explain the principle of foam fractionation with any its application in mineral processing. [10]
- b. Discuss the phenomenon of foam formation, coalescence, collapse and drainage in details. [10]

Q. 4:

- a. Explain the principle of HPLC and with the help of schematic diagram discuss various components of HPLC. [10]
- b. Discuss any one application of liquid chromatography. [5]
- c. Explain the working of reverse phase column chromatography. [5]

Q. 5:

- a. What do you mean by membrane modules. Explain hollow fibre module in details. [10]
- b. Derive the relation for flux in a dialysis process. i.e. [10]

$$NA = \frac{C_1 - C_2}{\frac{1}{kC_1} + \frac{1}{kC_2} + \frac{1}{P_m}}$$

Q. 6: Write short note on:

[20]

- a. Reverse osmosis
- b. Plate and frame module
- c. Affinity chromatography
- d. Modern adsorbents
