

(3 Hours)

[Total Marks: 80]

NB: (1) Attempt total Four questions.

(2) Question No. 1 is compulsory.

(3) Figures to the right indicate full marks.

(4) Assume data if required.

1. (a) Explain membrane performance with governing equation. 10
- (b) Demonstrate the criteria for selection of plate tower for absorption. 10
2. (a) Describe the advantages of packed tower over tray tower. 10
- (b) Illustrate the spray chamber. 10
3. (a) Explain the selection criteria of membrane thoroughly. 12
- (b) Demonstrate in brief: MF, UF, RO and NF. 08
4. (a) Explain the continuous distillation for multi component system. 10
- (b) Illustrate the advanced techniques of distillation. 10
5. (a) Differentiate between 10
  - i. Reverse osmosis and nano filtration.
  - ii. Liquid liquid extraction and membrane separation.
- (b) Explain the procedure for design of packed tower. 10
6. (a) Demonstrate degree of freedom for distillation column. 10
- (b) Explain design of batch distillation for multi components with rectification with constant reflux and constant overhead component. 10