

Scheme - I
Sample Question Paper

Program Name : Diploma in Chemical Engineering
Program Code : CH
Semester : Fifth
Course Title : Membrane Technology (Elective)
Marks : 70

22513

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Define membrane.
- b) Write principle of reverse osmosis.
- c) Define membrane fouling.
- d) Enlist any two membrane processes.
- e) Write any two application of nanotechnology.
- f) Discuss the concept of driving force for membrane processes.
- g) Enlist different types of membrane modules (any Four).

Q.2) Attempt any THREE of the following.

12 Marks

- a) Explain application of membrane separation process in waste water treatment.
- b) Discuss the concept of membrane fouling.
- c) Write scope of membrane technology in chemical industries.
- d) Compare membrane distillation process with convectional distillation process.

Q.3) Attempt any THREE of the following.

12 Marks

- a) Describe construction and working of ultrafiltration with neat sketch.
- b) List out any four factors which responsible for fouling in bioreactor.
- c) Compare membrane separation processes with convectional separation processes.
- d) Draw neat sketch of electro-dialysis.

Q.4) Attempt any THREE of the following.

12 Marks

- a) Compare synthetic material and inorganic material for membrane preparation.
- b) Differentiate ultrafiltration and microfiltration (four points).
- c) Describe submerged membrane bioreactor with well labeled diagram.
- d) Distinguish cost of membrane technology with convectional separation process.
- e) Describe the concept of nanotechnology.

Q.5) Attempt any TWO of the following.

12 Marks

- a) Describe construction and working of microfiltration with neat sketch.
- b) Explain any one pretreatment method to overcome membrane fouling.
- c) Compare ion exchange method with membrane technology (Any six points)

Q.6) Attempt any TWO of the following.

12 Marks

- a) Explain the concept of dialysis with neat diagram.
- b) Draw a well labeled diagram of spiral wound membrane module.
- c) Explain the mechanism involved in fouling of membrane.

Scheme - I
Sample Test Paper - I

Program Name : Diploma in Chemical Engineering
Program Code : CH
Semester : Fifth
Course Title : Membrane Technology (Elective)
Marks : 20

22513

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR

08 Marks

- a) Write the principle of membrane process.
- b) Differentiate dead end membrane process and cross flow membrane process (any two).
- c) Name any four membrane module.
- d) Write any two benefits of membrane processes over conventional separation processes.
- e) Define the following
 - i) Chemical Potential
 - ii) Osmosis
- f) Write any two industrial applications of membrane technology.

Q.2 Attempt any THREE

12 Marks

- a) Define the following:
 - i) Membrane
 - ii) Feed Flux
 - iii) Dialysis
 - iv) Retention efficiency of the membrane
- b) Discuss Reverse osmosis process.
- c) Give physical and chemical properties of membrane (any Two).
- d) Explain hollow fibre membrane module with well labeled diagram.
- e) Name any one of the following:
 - i) Polymeric membrane
 - ii) Composite membrane
 - iii) Liquid membrane
 - iv) Ceramic Membrane
- f) Draw a neat sketch of electrodialysis.

Scheme - I
Sample Test Paper - II

Program Name : Diploma in Chemical Engineering
Program Code : CH
Semester : Fifth
Course Title : Membrane Technology (Elective)
Marks : 20

22513

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Write any two factors responsible for membrane fouling.
- b) Give any two application of nanotechnology.
- c) Write concept of reversible fouling.
- d) Name any two methods to reduce membrane fouling.
- e) Write effect of concentration polymerization in dead-end and cross- flow arrangements.
- f) Give any two disadvantages of membrane separation process.

Q.2 Attempt any THREE.

12 Marks

- a) Explain scope of membrane technology in water treatment..
- b) Describe in detail membrane bioreactor.
- c) Differentiate reversible and irreversible membrane fouling.
- d) Describe submerged membrane bioreactor with well labeled diagram.
- e) Give any four industrial application of membrane bioreactor.
- f) Discuss the economic feasibility of membrane technology.