

General Instructions

1. All question is compulsory
2. Draw neat figure wherever necessary

Q-1(a) Classify polymer membrane based on its structure with one example of each type. [7 Marks]

OR

Q-1(a) Discuss crystallinity for the selection of polymer for membrane development. [7 Marks]
Q-1(b) Write note on "Thin Film Composite (TFC) Membrane". [7 Marks]

OR

Q-1(b) Discuss different factors affecting membrane performance. [7 Marks]

Q-2(a) Write different grafting techniques used for modification of polymer membrane. [7 Marks]

OR

Q-2(a) Discuss DSC: Working principle, process and applications. [7 Marks]
Q-2(b) Define MF, and discuss various applications of MF membrane. [7 Marks]

OR

Q-2(b) Define UF, and discuss various applications of UF membrane. [7 Marks]

Q-3(a) Write note on "nanofiltration". [7 Marks]

OR

Q-3(a) Write note on "pervaporation" and "gas separation". [7 Marks]
Q-3(b) Discuss diffusion-controlled polymers for controlled drug release. [7 Marks]

OR

Q-3(b) Explain biodegradable polymers for controlled drug release. [7 Marks]

Q-4(a) What is biocompatibility? Write characteristics of biocompatible polymers for controlled drug delivery. [7 Marks]

OR

Q-4(a) Liposomes polymer aggregates. [7 Marks]
Q-4(b) Discuss polyion complexes for controlled drug release. [7 Marks]

OR

Q-4(b) Define biodegradable and bioerodable polymer system. [7 Marks]

QUESTION –5 ANSWER ANY SEVEN QUESTIONS OUT OF TWELVE**[Max. marks: 7×2=14 MARKS]**

- (i) Define membrane.
- (ii) Membrane processes are _____ controlled processes.
- (iii) Which of the following polymer can be used for preparation of asymmetric RO membrane by a phase inversion technique ?

(A) Polysulfone (B) Polyethersulfone (C) Cellulose (D) Polyacrylonitrile

(iv) Cation exchange membrane possesses fixed _____ charges attached to polymer backbone. (Fill in the Blank)

(v) Water flux of nanofiltration is _____ than reverse osmosis membrane. (**Fill in the blank**).

(vi) Controlled drug delivery refers to methods and systems designed to release a therapeutic agent at a predetermined rate, location, and time. (**True or False**).

(vii) In diffusion dialysis which type of the following polymeric membrane can be used ?
 A) Polyvinyl alcohol B) Polystyrenesulfonic acid C) Polysulfone D) All of these

(viii) Based on amount of pressure applied which one is correct order?
 A) MF < UF < NF < RO B) MF > UF > NF < RO
 C) UF < MF < RO > NF D) MF > UF > NF > RO

(ix) Natural phospholipids capable of forming vesicles is called _____. (Fill in the blank).

(x) Which of the following is not a membrane preparation technique?
 A) Interfacial polymerization B) Crosslinking
 C) Phase inversion D) Track etching

(xi) Polypeptides capable of forming vesicles are called _____. (Fill in the blank).

(xii) In the self-assembly, attractive force(s) that hold the molecules together is/ are:
 A) van der Waals forces B) Hydrogen bonding
 C) Electrostatic D) All of these
