

B.Tech. SEM -VII (Chemical 2014 Course (CBCS) : SUMMER - 2019
SUBJECT: 2) ELECTIVE – III MEMBRANE SEPARATION

Day: Thursday
Date: 09/05/2019

Time: 02.30 PM TO 05.30 PM
Max Marks. 60

S-2019-2783

N.B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of Non-programmable calculator is **ALLOWED**.
- 4) Assume suitable data if **necessary**.

Q.1 What is membrane? Which are different membrane processes? Classify them based on driving force and membrane characteristics. (10)

OR

How does use of polymeric and inorganic material affect mechanical, chemical and thermal stability of membranes? (10)

Q.2 What are composite membranes? Which are the methods for preparation of composite membranes? Explain in details. (10)

OR

- a) What is bubble point method? What is its principal? How it is used for membrane analysis? (05)
- b) What is density measurement analysis? How it is used for membrane characterization? (05)

Q.3 a) What is friction model for flow through porous membrane? How does separation occur as per the friction model? (05)

b) What is ultrafiltration? Explain the properties of membranes and industrial applicability. (05)

OR

a) What is Knudsen flow model for flow through porous membranes? How does separation occur as per Knudsen flow model? (05)

b) What is microfiltration? Explain the membrane characteristics and applicability. (05)

Q.4 What is solution-diffusion mechanism? Explain the effect of solubility and diffusivity on separation characteristics. (10)

OR

a) What is free volume theory for separation of materials? (05)

b) How does crystallinity affect solubility and diffusivity in polymeric membranes? (05)

Q.5 What is dialysis? Explain the working, membrane properties and with industrial applications. (10)

OR

What is liquid membrane? How they are prepared? Explain their working, characteristics and industrial applicability. (10)

Q.6 What is difference between plate and frame, and spiral wound module? How does spiral wound module prepared? Explain the merits and limitations with industrial applicability. (10)

OR

What is difference between spiral wound and tubular module? Explain their merits and limitations with industrial applicability. (10)

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