P P SAVANI UNIVERSITY

Seventh Semester of B. Tech. Examination

December 2021

SECH4530 Membrane Technology

22-12-2021, Wednesday **Time: 09.00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	Discuss the module and types of modules used in membrane separations.	[10]
Q - 2	Explain with diagram: Concentration Polarization and Fouling.	[10]
	OR	
Q - 2	Discuss Reverse Osmosis (RO) concept with diagram.	[10]
Q - 3 (a)	Explain Concept of Nanofiltration.	[05]
Q - 3 (b)	Discuss membrane manufacturing processes.	[05]
	OR	
Q - 3 (a)	Discuss Types of membranes and separation mechanisms	[05]
Q - 3 (b)	Explain the parameters affecting the performance of Nanofiltration.	[05]

SECTION – II

Q - 1	Answer the Following: (**Any 5**)	[05]
(i)	Which of the following is a mechanism of transport in microfiltration? [A]Direct interception [B] Inertial impaction [C] Adsorptive retention [D] all of the above	
(ii)	Name the membrane process which is used as artificial kidney.	
(iii)	Give an example of a non-membrane process for desalination of brackish water.	
(iv)	State a difference between glassy polymer and rubbery polymer.	
(v)	Which membrane process can be integrated with distillation for efficient dehydration of ethyl alcohol?	
(vi)	Give two examples of inorganic membrane.	
(vii)	Define MWCO of a membrane.	
Q - 2 (a)	Discuss factors affecting the Reverse osmosis process in details.	[05]
Q - 2 (b)	Explain solution diffusion model of solute transport.	[05]
	OR	
Q - 2 (a)	Explain dual sorption model of gas transport through membranes. State two applications of membrane gas separation.	[05]
Q - 2 (b)	Discuss various physio-chemical factors affecting gas separation.	[05]
Q - 3 (a)	Discuss with a diagram various mas transfer resistances in dialysis. Derive the expression solute flux.	[05]
Q - 3 (b)	Write a brief note of diffusion dialysis and its application.	[05]
	OR	
Q - 3 (a)	Discuss various strategies to reduce the effect of concentration polarization in membrane processes.	[05]
Q - 3 (b)	Write a short note of affinity ultrafiltration.	[05]
Q - 4	Draw a conceptual schematic representation of an integrated membrane process and explain different parts.	[05]

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