M.Tech. First Semester (Membrane & Separation Tech.) (F.T.)

13024 : Membrane Separation Process

1 MST 2

P. Pages : 1

Time : Three Hours

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AV - 3376

Max. Marks : 80

Notes : 1. Answer **any six** question.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and chemical equations should be given wherever necessary.
5. Illustrate your answer necessary with the help of neat sketches.
6. Use of pen Blue/Black ink/refill only for writing the answer book.

1. Explain in details membrane filtration and compare dead end pressure and crossflow membrane filtration. **14**

2. How to evaluate membrane performance ? Explain the operating parameters influencing performance of a membrane. **13**

3. How is membrane distillation performed ? Discuss its applications and advantages in details. **13**

4. How are membrane separation processes classified and what is their selection criteria. **13**

5. How gases can be separated by membrane process ? Explain with suitable example and derive an expression for x_p. **13**

6. What is reverse osmosis and how can it be applied in treatment of non aqueous solutions in liquid phase ? **13**

7. How concentration polarization occurs and is it a reversible process ? Explain with suitable example. **13**

8. What do you mean by integrity of membrane ? Explain the bubble point and air diffusion tests used for determining integrity of membrane. **13**

9. Explain in details salient features of a membrane bioreactor and discuss its applications. **13**

10. Explain the following : **14**
i) Importance of membrane separation in dairy waste treatment.
ii) Membrane fouling and its effect on performance of membrane separation process.

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