Reg. No. :

Question Paper Code: 58971

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

One credit course

Chemical Engineering

15UCH871 - MEMBRANE TECHNOLOGY

(Regulation 2015)

Duration: 1.30 hours   Maximum: 50 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Polymers which cannot be processed by solution casting are   CO1- R

   (a) Polyethylene and nylon   (b) Polystyrene

   (c) Both (a) and (b)   (d) None of the above

2. Microporous membranes has pore size of   CO1- R

   (a) 1-10µm dia   (b) 0.01-10 µm dia   (c) 100-1000 µm dia   (d) 50-100 µm dia

3. _____membranes are being considered for the separation of   CO1- R
   hydrogen from gas mixtures.

   (a) zirconium   (b) palladium   (c) nickel   (d) both (a) and (c)

4. Casting solution solvents are   CO1-R

   (a) Benzene   (b) Acetone   (c) Dimethyl formamide   (d) Ethyl formate

5. The mechanism of transport through the non-porous dense membrane is by   CO1-R

   (a) Solution diffusion model   (b) Pore flow model

   (c) Both (a) and (b)   (d) Temperature difference

6. Microfiltration membranes filter _____ from 0.1 to 10 μm. CO2-R

   (a) salts   (b) influenza virus

   (c) sucrose   (d) colloidal particles and bacteria

7. The driving force of pervaporation process is CO2-R

   (a) High vapor pressure on the permeate side

   (b) Low vapor pressure on the permeate side

   (c) Concentration gradient on the permeate side

   (d) All of the above

8. A 40 inch long spiral wound modules with a module diameter of 4 will have an area of _____ m^2 CO2- R

   (a) 6 -12   (b) 3-6   (c) 20-40   (d) 80-150

9. Microfiltration membranes filter _____ from 0.1 to 10 μm CO2-R

   (a) Salts   (b) Influenza virus

   (c) Sucrose   (d) Colloidal particles and bacteria

10. Increasing the polymer casting solution concentration always CO2-R

   (a) Increases porosity and flux of membrane

   (b) Reduces porosity and flux of membrane

   (c) Increases porosity and decreases flux of membrane

   (d) Reduces porosity and increases flux of membranes

PART – B (5 x 2= 10 Marks)

11. List some of the key properties determining membrane performance. CO1- R
12. Write down the three different mechanisms by which separations occur. CO1 -R
13. How membranes are used in control drug delivery? CO1- R
14. What is the difference between osmosis and reverse osmosis? CO2 -R
15. How isotropic nonporous membranes are synthesized by solution casting? CO2 -R

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PART – C (2 x 15= 30 Marks)

16. (a) Discuss about various methods by which porous membranes are synthesized?   CO1 -U   (15)

Or

(b) Explain the methods which are used to synthesize dense film membranes.   CO1-U   (15)

17. (a) Demonstrate various methods by which anisotropic membranes are synthesised.   CO2 -U   (15)

Or

(b) Discuss in detail the design considerations involved in fabricating spiral wound membranes and hollow fiber membranes.   CO2 -U   (15)

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