

Total No. of Pages 01

-12-

Roll No.

6th SEMESTER

B.Tech. PSCT

MID SEMESTER EXAMINATION

March 2019

PT304

Mass Transfer

Time: 1:30 Hours

Max. Marks :30

Note : Attempt all question. Use of graph paper is permitted.
Assume suitable missing data, if any.

- 1[a] (i). What is the effect of impurities on the crystal formation?
(ii). Define the term 'Supersaturation'? Explain the Miers' Supersaturation theory. (2+1.5+4)= [7.5]

[b] (i). Explain the term 'Permeation' with suitable example (s).

- (ii). Explain the construction and working of Vacuum Crystalliser with suitable diagram. (2.5+5) = [7.5]

2 [a]. A mixture containing 70 mol% benzene and 30 mole% toluene is to be vaporised at 760 mm Hg until 1/3 moles of the original mixture are in vapour phase. Calculate the composition of the distillate and the residue when the separation takes place under (i) Equilibrium Distillation and (ii) Differential Distillation. The average relative volatility of benzene with respect to toluene is 2.5. [7.5]

[b]. Derive the Rayleigh Equation. If α is the constant relative volatility, Prove

that $\left(\frac{N_B}{N_{OB}}\right)^\alpha = \left(\frac{N_A}{N_{OA}}\right)$ where, $N_{OA}=F x_F$, $N_{OB}=F(1-x_F)$ and $N_A=W x_W$ and

$$N_B=W(1-x_W)$$

[7.5]

-----END-----