Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Petroleum Refinary Engineering) (Sem.–5)

MASS TRANSFER-II

Subject Code : BTCH-502

M.Code : 70522

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Explain briefly :

a) What do you mean by positive and negative deviations from Raoults Law?

b) Define Reflux ratio.

c) What is the value of reflux ratio at total reflux?

d) Name the factors that are to be considered for choice of a solvent in extraction operation.

e) Under what range of pressure in molecular distillation is earned out?

f) Give an example of Type I ternary liquid system.

g) What are the advantages of extraction with supercritical fluids?

h) What is heat of crystallization?

i) What is the order of heat exchange in chemisorptions?

j) What are molecular sieves?

SECTION-B

2. Explain flash vaporization in detail.

3. Explain any one method to calculate theoretical plates in a distillation column.

4. A continuous rectification column with a reboiler and a total condenser is to be designed to separate a solution of n - heptanes and octane having 70 mol% n - heptanes. The overhead and bottom products contain 95 and 5 mol% n - heptanes. The feed will be liquid at its boiling point and reflux ratio is 1.8 times the minimum reflux. The column is at pressure of 101.33 Kn/m^2.

X	0	0.13	0.22	0.32	0.46	0.57	0.69	0.82	0.92	1
Y	0	0.24	0.37	0.5	0.65	0.74	0.83	0.91	0.96	1

Assuming overall plate efficiency to be 70% , calculate number of plates to be provided in the column. If an identical tower but having 16 plates is employed for above separation with same condition, what will be overall plate efficiency of the column?

5. Explain extractive distillation in detail.

6. Explain with the help of diagram working and construction of schiebel extractor.

SECTION-C

7. Explain with the help of neat labeled diagram explain the working of hielderbrandt extractor.

8. Explain the mechanism of adsorption in detail.

9. Explain the reactive crystallization in detail.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.