

- Q.21 Define moisture content on wet basis and dry basis. (CO4)
- Q.22 Explain the types of tower packing. (CO2)

### SECTION-D

**Note:** Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

- Q.23 Explain molecular diffusion in gases under steady state conditions for:
- a) Equimolar counter diffusion (CO1)
  - b) Diffusion through stationary gas (CO1)
- Q.24 With the help of diagram, describe the construction, working principle and applications of mechanically agitated vessels used for gas absorption. (CO2)
- Q.25 Discuss the construction, working and importance of a cooling tower. (CO3)

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### 4th Semester/ Chemical Subject: Mass Transfer Operations-I

Time : 3 Hrs.

M.M. : 60

### SECTION-A

**Note:** Multiple choice questions. All questions are compulsory (6x1=6)

- Q.1 What is the SI unit of diffusivity (also called diffusion Coefficient)? (CO1)
- a)  $m^2/s$
  - b)  $Kg/m^2.s$
  - c)  $m/s$
  - d)  $kg/m^3$
- Q.2 At equilibrium the driving force for mass transfer between two phases is: (CO2)
- a) Maximum
  - b) Minimum
  - c) Zero
  - d) Infinite
- Q.3 In a packed column for absorption, NTU stands for: (CO3)
- a) Number of Transport Units
  - b) Number of Transfer Units
  - c) Natural Transfer Units
  - d) Neutral Transfer Units

- Q.4 Humidification is the process of: (CO3)
- Removing moisture from air
  - Adding moisture to air
  - Cooling the air
  - Increasing air pressure
- Q.5 The difference between drying and evaporation is: (CO4)
- Drying removes volatile solvents only
  - Evaporation is used only for gases
  - Drying removes liquid from solid
  - Drying involves heat transfer only

- Q.6 What is the correct definition of diffusion? (CO1)
- Movement of molecules due to pressure difference
  - Movement of molecules from lower concentration to higher concentration
  - Movement of molecules from higher concentration to lower concentration
  - Movement of molecules due to gravitational forces

### SECTION-B

**Note:** Objective/ Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 Diffusion occurring due to molecular motion only is called \_\_\_\_\_. (CO1)

- Q.8 Write Henry's law. (CO2)
- Q.9 Define mass transfer. (CO1)
- Q.10 Free moisture is the moisture that can be \_\_\_\_\_. (CO4)
- Q.11 Humidity chart is also known as \_\_\_\_\_. (CO4)
- Q.12 The equilibrium relationship between gas and liquid is given by. (CO1)

### SECTION-C

**Note:** Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

- Q.13 Differentiate between molecular diffusion and eddy diffusion. (CO1)
- Q.14 Explain Whitman's Two-Film Theory in brief. (CO1)
- Q.15 State Raoult's law and give its significance in mass Transfer. (CO1)
- Q.16 Define HTU, and HETP. (CO2)
- Q.17 Differentiate between dry bulb temperature and wet bulb temperature. (CO3)
- Q.18 Draw and explain the rate of drying curve. (CO4)
- Q.19 Discuss the role of diffusion in liquid-liquid extraction. (CO1)
- Q.20 Differentiate between individual and overall mass transfer coefficient. (CO1)