

- Q.26 What is the difference between forced diffusion and eddy diffusion ?  
 Q.27 What is the difference between absolute humidity and relative humidity ?  
 Q.28 Define gas solubility. why it an important parameter for selection of solvent for a particular gas absorption operation ?  
 Q.29 What is the difference between bound moisture and unbound moisture ?  
 Q.30 What are the characteristics of a good tower packing ?  
 Q.31 Define and discuss Raoult's law in brief ?  
 Q.32 Discuss the construction of rotary drier in brief ?  
 Q.33 Explain working of spray drier in brief ?  
 Q.34 What are the advantages and disadvantages of tray drier ?  
 Q.35 Draw and explain in brief, rate drying curve ?

#### **SECTION-D**

- Note:** Long answer questions. Attempt any two questions out of three questions. (2x10=20)  
 Q.36 Discuss the mechanism of absorption operation? Establish the operating line equation for countercurrent flow of liquid and gas during absorption operation ?  
 Q.37 Describe the different theories used to explain mass transfer coefficient in detail with the help of neat diagrams ?  
 Q.38 Discuss working of the cooking Tower in brief? Describe different cooling tower arrangements in detail with the help of neat diagrams ?

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**4th Sem. / Chem., P&P  
Subject :Mass Transfer I**

Time : 3 Hrs.

M.M. : 100

#### **SECTION-A**

**Note:** Multiple choice Questions. All questions are compulsory (10x1=10)

- Q.1 Which one of the following has a direct bearing on extent of mass transfer?  
 a) Concentration difference  
 b) Temperature difference  
 c) Pressure difference  
 d) Voltage difference  
 Q.2 How mass transfer co-efficient of liquid phase is affected by temperature?  
 a) More than that of gas phase  
 b) Less than that of gas phase  
 c) Not affected  
 d) None of the above  
 Q.3 Penetration theory relates average mass transfer co-efficient (K) and diffusivity (D) as?  
 a)  $K \propto D$                           b)  $K \propto D^{1/2}$   
 c)  $K \propto D^{3/2}$                           d)  $K \propto D^2$   
 Q.4 At the same gas flow rate, the pressure drop in a packed tower being irrigated with liquid as compared to that in dry packed tower is ?  
 a) Same                                  b) Lower  
 c) Greater                                d) Uncertain

## **SECTION-B**

**Note:** Objective type questions. All questions are compulsory (10x1=10)

- Q.11 Name a solvent used for removal of ammonia from ammonia-air mixture by gas absorption unit operation?

Q.12 State Fick's law ?

Q.13 Name a mass transfer operation involving direct contact of two immiscible phases ?

Q.14 Write S.I. unit of vapour pressure ?

Q.15 Define humid volume ?

Q.16 What is wet bulb temperature ?

Q.17 Define critical moisture content

Q.18 Name any two types of equipment which is used in chemical industry for carrying out gas-liquid contact type mass transfer operation ?

Q.19 Name a gas liquid mass transfer operation used in chemical industry ?

Q.20 Define vapour pressure ?

## **SECTION-C**

**Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 What is the difference between direct and indirect mass transfer operation?
  - Q.22 Discuss the importance of mass transfer operations in brief?
  - Q.23 Define and discuss mass transfer coefficient in briefs?
  - Q.24 How will you classify the mass transfer operation on the basis of direct contact of two immiscible phases?
  - Q.25 Explain the equilibrium solubility of gases in liquids?