

University of Mumbai
Examination 2020 under cluster PCOE

Program: TE Chemical Engineering
Curriculum Scheme: Rev2016
Examination: Third Year, Semester V
Course Code: CHC502 and Course Name: Mass Transfer operation I

Time: 1 hour

Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	What is the perfect condition for dehumidification of air?
Option A:	air is heated above its dew point temperature
Option B:	air is cooled up to its dew point temperature
Option C:	air is heated below its dew point temperature
Option D:	air is cooled below its dew point temperature
Q2.	At 100% relative humidity, the wet bulb temperature is
Option A:	lower than the dew point temperature
Option B:	higher than the dew point temperature
Option C:	equal to the dew point temperature
Option D:	less than the dew point temperature
Q3.	The dew point temperature is less than the wet bulb temperature for
Option A:	saturated air
Option B:	unsaturated air
Option C:	both saturated and unsaturated air
Option D:	Not for both both saturated and unsaturated air
Q4.	The horizontal line in psychrometric chart joining the change of state of air represents
Option A:	humidification
Option B:	sensible cooling or heating
Option C:	sensible cooling or heating with humidification
Option D:	sensible cooling or heating with dehumidification
Q5.	As compared to packed towers, the pressure drop in tray is
Option A:	Less
Option B:	More
Option C:	There is no effect on the pressure drop
Option D:	May be less or may be more
Q6.	Generally, in tray towers, the weir length of the weir is
Option A:	10 to 20 % of the tower diameter
Option B:	30 to 40 % of the tower diameter
Option C:	50 to 60 % of the tower diameter
Option D:	60 to 80 % of the tower diameter
Q7.	Absorption is an unit operation which generally involves _____systems

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Option A:	Liquid -solid
Option B:	Gas-solid
Option C:	Fluid-solid
Option D:	Solid-solid
Q8.	Absorption factor is the ratio of
Option A:	Slope of the operating line to the slope of equilibrium curve
Option B:	Slope of the equilibrium curve to the slope of the operating line.
Option C:	Gas flow rate to the liquid flow rate
Option D:	Liquid flow rate to the gas flow rate
Q9.	In steady state equimolar counter diffusion of gas A and gas B, the molar flux of A is given as-
Option A:	$N_A = \frac{D_{AB}P}{RTzP_{BM}}(P_{A1} - P_{A2})$
Option B:	$N_A = \frac{D_{AB}}{RTz}(P_{A1} - P_{A2})$
Option C:	$N_A = \frac{D_{AB}}{z} \left(\frac{\rho}{M_W} \right)_{Avg} \frac{1}{x_{BM}} (x_{A1} - x_{A2})$
Option D:	$N_A = \frac{D_{AB}}{z} \left(\frac{\rho}{M_W} \right)_{Avg} (x_{A1} - x_{A2})$
Q10.	In steady state molecular diffusion of component A in non-diffusing component B, the following is true
Option A:	$N_A = 0$
Option B:	$N_B = 0$
Option C:	$N_A = N_B$
Option D:	$N_A = -N_B$
Q11.	In turbulent flow, mass transfer is fast due to _____
Option A:	Anomalous diffusion
Option B:	passive diffusion
Option C:	molecular diffusion
Option D:	eddy diffusion
Q12.	The Nusselt number analogous to _____
Option A:	Schmidt number
Option B:	Lewis number
Option C:	Prandtl number
Option D:	Sherwood number
Q13.	In spray chambers
Option A:	Gas phase is dispersed and liquid phase is continuous
Option B:	Liquid phase is dispersed and gas phase is continuous
Option C:	Both gas phase and liquid phase are dispersed
Option D:	Both gas phase and liquid phase are continuous

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Q14.	In wetted wall column
Option A:	Gas phase is dispersed and liquid phase is continuous
Option B:	Liquid phase is dispersed and gas phase is continuous
Option C:	Both gas phase and liquid phase are dispersed
Option D:	Both gas phase and liquid phase are continuous
Q15.	For estimating the drier size it is necessary to know _____
Option A:	Time of drying
Option B:	Heat of drying
Option C:	Speed of drying
Option D:	Material of drying
Q16.	The value of _____ remains constant while drying if speed and direction of gas flow never change.
Option A:	Mass transfer co-efficient
Option B:	Humidity
Option C:	Moisture
Option D:	Concentration
Q17.	What is the unit of mass transfer coefficient?
Option A:	m^2
Option B:	m/s
Option C:	m^2s
Option D:	m^2/s
Q18.	Packing height in the packed tower = NTU x _____ .
Option A:	HTU + NTU
Option B:	HETP
Option C:	HTU
Option D:	HETP + HTU
Q19.	Find the absorption tower height if number of gas phase transfer units are 4.09 and height of gas phase transfer units is 1.5 m.
Option A:	2.72 m
Option B:	0.36 m
Option C:	6.135 m
Option D:	5.15 m
Q20.	For the Absorber design, the plotting with mole ratio helps to find the _____ .
Option A:	Slope of operating line
Option B:	Slope of equilibrium curve
Option C:	Minimum number of trays
Option D:	Maximum number of trays
Q21.	The height of a transfer unit (HTU) signify _____ .
Option A:	the separation effectiveness of the particular packings
Option B:	the number of transfer units

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Option C:	the total height of the column
Option D:	the number of theoretical trays
Q22.	The height equivalent to a theoretical plate (HETP) changes with flow rates?
Option A:	because flow rates affect the absorption rates
Option B:	because flow rates does not affect the absorption rates
Option C:	because flow rates are in cross-current manner
Option D:	because flow rates are in co-current manner
Q23.	Find the partial pressure of A if the total pressure is 2 atm; Concentration of A is 2 mol/cu.m and total concentration is 5 mol/cu.m.
Option A:	0.2 atm
Option B:	0.4 atm
Option C:	0.6 atm
Option D:	0.8 atm
Q24.	For a steady state equimolar counter diffusion of A and B. The N flux of A is _____.
Option A:	– N flux of A
Option B:	N flux of A
Option C:	– N flux of B
Option D:	N flux of B
Q25.	Which among the following is always true for mass transfer to occur?
Option A:	Difference in concentration
Option B:	Difference in Pressure
Option C:	Difference in temperature
Option D:	Difference in chemical potential