

University of Mumbai
Examination 2020 under cluster- PCOE

Program: Chemical Engineering

Curriculum Scheme: Rev2016

Examination: Second Year Semester III

Course Code: CHC305 and Course Name: Process Calculations

Time: 1 hour

Max. Marks: 50

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

Q1	An evaporator is maintained under vacuum of 475 Torr. Find the absolute pressure in the evaporator in psi
Option A:	5511
Option B:	5.511
Option C:	2511
Option D:	3.451
Q2	The superficial mass velocity is found to be 600 lb/h. ft ² . Find its equivalent in kg/s. m ²
Option A:	0.814
Option B:	0.765
Option C:	564.3
Option D:	2.567
Q3	Calculate the volume in m ³ of 45 kg of chlorine at a pressure of 0.9 bar and 293 K
Option A:	1.693
Option B:	169.3
Option C:	16.93
Option D:	100
Q4	Calculate the volume in m ³ of 15 kg of a substance with a density of 0.9 kg/L and at 293 K
Option A:	16.67
Option B:	1667
Option C:	0.017
Option D:	1.667
Q5	Expression for enthalpy balance of a distillation column is the enthalpy of
Option A:	Feed +Distillate-Bottom-Condenser+ Reboiler = 0
Option B:	Feed -Distillate-Bottom-Condenser- Reboiler = 0
Option C:	Feed -Distillate-Bottom-Condenser+ Reboiler = 0
Option D:	Feed +Distillate-Bottom-Condenser- Reboiler = 0
Q6	If 64kg methane is burnt with 50% excess air, find the mole ratio of methane to oxygen in the feed
Option A:	0.33

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Option B:	1.5
Option C:	0.8
Option D:	3
Q7	Calculate the amount of steam in grams to be condensed to increase the concentration of a liquor from 5% to 40%.if the enthalpy required for the operation is 2500kcal and latent heat of steam is 500kcal/kg
Option A:	5
Option B:	200
Option C:	5000
Option D:	0.2
Q8	In the condenser of a distillation unit, enthalpy is
Option A:	supplied to the system
Option B:	supplied by the system
Option C:	supplied by the surrounding
Option D:	neither of the above
Q9	If the flue gas supplies enthalpyof 4000kJ for heating 50kg of boiler feed water by 20K,calculate the heat capacity of the waterin J/kg K
Option A:	4
Option B:	250
Option C:	1000
Option D:	4000
Q10	What does NHV stands for:
Option A:	Net Heating Value
Option B:	Non Heating Value
Option C:	Net Hydrogen Value
Option D:	None of above
Q11	Heat required to vaporize unit amount of solid at constant temperature and pressure
Option A:	Latent heat of sublimation
Option B:	Latent heat of condensation
Option C:	Latent heat of vaporization
Option D:	Latent heat of fusion
Q12	Cp is expressed in S.I. unit as
Option A:	J/(kg.K)
Option B:	K
Option C:	W/(m.K)
Option D:	W/(cm.K)

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Q13	The standard heat of reaction is the enthalpy change associated with a chemical reaction when both reactants and products are in their _____ states.
Option A:	Normal
Option B:	Standard
Option C:	Positive
Option D:	Negative
Q14	Heat of mixing is the heat of solution in a process in which both solute and solvents are _____.
Option A:	Solid
Option B:	Liquid
Option C:	Gaseous
Option D:	All of the above
Q15	The total heat produce when a unit mass of fuel is completely burned with pure oxygen is called as Calorific values of
Option A:	fuel
Option B:	water
Option C:	Both fuel and water
Option D:	None of above
Q16	Which of the following is correct about an isothermal process?
Option A:	$dT > 0$
Option B:	$dT < 0$
Option C:	$dT = 0$
Option D:	None of Above
Q17	A batch of 20% of acetic acid is prepared by mixing the acetic acid of two containers A and B. A (400 kg) contains 80% of acetic acid and B contains 15% of acetic acid. Calculate the amount (kg) of acid prepared of acid is prepared?
Option A:	5700
Option B:	7600
Option C:	8000
Option D:	5200
Q18	In a drying operation, the wet solids entering the drier contain 80% moisture and the dried solids contain 20% moisture. The mass of water evaporated is 2000kg. Calculate the amount of wet solids fed into the drier.
Option A:	4666.67
Option B:	3666.67
Option C:	2666.67
Option D:	1666.67
Q19	A system in which one or more than one conditions vary with time is called _____

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Option A:	Open system
Option B:	Closed system
Option C:	Steady state system
Option D:	Unsteady state system
Q20	A tie component balance is possible in
Option A:	Absorption
Option B:	Distillation
Option C:	Extraction
Option D:	Mixing
Q21	8 moles of A were present in a system initially, and 24 moles of B are added to it, it undergoes the reaction $2A + 3B \rightarrow 4C + 5D$, what are the number of moles of D produced?
Option A:	10
Option B:	20
Option C:	30
Option D:	40
Q22	A combustion reaction has reactants 1 mole of C_xH_y and 2 moles of O_2 and products 1 mole of CO_2 and 2 mole of H_2O , what is $x + y$?
Option A:	1
Option B:	3
Option C:	4
Option D:	5
Q23	10 moles of O_2 is added to 10 moles of H_2 , how many moles of H_2O will it produce?
Option A:	5
Option B:	10
Option C:	15
Option D:	20
Q24	A reaction has reactants 2 moles of $NaOH$ and 1 mole of H_2SO_4 , and products Na_2SO_4 and H_2O , what are the total moles of products?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q25	The percentage of inert in feed is 5. Find the amount of inert in kg in the purge stream if feed is 100kg.
Option A:	10
Option B:	2.5

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Option C:	25
Option D:	5