

University of Mumbai
Examination 2020 under cluster PCOE (Lead College Short name)

Program: Chemical Engineering

Curriculum Scheme: Rev2016

Examination: Third Semester IV

Course Code: CHC403 and Course Name: CET-II

Time: 1 hour

Max. Marks: 50

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

Q1.	Which of the following is not affected by the temperature?
Option A:	Fugacity
Option B:	Activity co-efficient
Option C:	Free energy
Option D:	Molecular weight
Q2.	If the phase of a multi-component system is enlarged, which of the following will happen?
Option A:	U,S and V will increase and T,p and chemical potential will remain same
Option B:	U,S and V will decrease and T,p and chemical potential will remain same
Option C:	U,S and V will increase and T,p and chemical potential will decrease
Option D:	U,S and V will decrease and T,p and chemical potential will increase
Q3.	An equation in Gibbs energy is be given by
Option A:	$dG = Vdp + SdT + \Sigma(\text{molal chemical potential}) \cdot dn$
Option B:	$dG = Vdp - SdT - \Sigma(\text{molal chemical potential}) \cdot dn$
Option C:	$dG = Vdp + SdT - \Sigma(\text{molal chemical potential}) \cdot dn$
Option D:	$dG = Vdp - SdT + \Sigma(\text{molal chemical potential}) \cdot dn$
Q4.	The sum of partial volumes of all gases in a mixture is equal to
Option A:	less than the total volume of the mixture
Option B:	the total volume of the mixture
Option C:	more than the total volume of the mixture
Option D:	cannot predict
Q5.	Excess properties are important in the study of
Option A:	Ideal gases
Option B:	Ideal solutions
Option C:	Non-ideal mixtures
Option D:	A pure component
Q6.	Raoult's law is valid when:
Option A:	both vapour and liquid are non-ideal
Option B:	both vapour and liquid are ideal
Option C:	vapour is ideal and liquid is non-ideal
Option D:	vapour is non-ideal and liquid is ideal
Q7.	Which one of the following statements is true with reference to the maximum boiling azeotropes?

University of Mumbai
Examination 2020 under cluster PCOE (Lead College Short name)

Option A:	There is a maximum on the vapour-pressure curve
Option B:	The solution exhibits positive deviation from ideality
Option C:	The solution exhibits negative deviation from ideality
Option D:	The activity coefficients are greater than unity.
Q8.	A solution exhibiting positive deviation from ideality:
Option A:	Always forms a minimum boiling azeotrope
Option B:	Always forms a maximum boiling azeotrope
Option C:	Has a total pressure that is less than that predicted by Raoult's law
Option D:	When formed from its constituents there is an absorption of heat
Q9.	The excess volume and the volume change of mixing are _____.
Option A:	equal
Option B:	not equal
Option C:	always negative
Option D:	always positive
Q10.	For _____ boiling azeotrope the boiling temperature of the azeotrope is less than the low boiler and the high boiler.
Option A:	maximum
Option B:	minimum
Option C:	neither minimum or maximum
Option D:	both minimum and maximum
Q11.	Modified Raoult's law is applicable to _____ solutions.
Option A:	ideal
Option B:	neither ideal and non-ideal
Option C:	both ideal and non-ideal
Option D:	non-ideal
Q12.	Gibbs-Duhem equation is applicable to _____ thermodynamics.
Option A:	ideal gas
Option B:	non-ideal gas
Option C:	solution
Option D:	vapour phase

University of Mumbai

Examination 2020 under cluster PCOE (Lead College Short name)

Q13.	The equilibrium constant at 427°C for the reaction: $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ is $K_p = 9.4 \times 10^{-5}$. Calculate the value of ΔG° for the reaction at 427°.
Option A:	-33 kJ
Option B:	-54 kJ
Option C:	54 kJ
Option D:	33 kJ
Q14.	free energy change at equilibrium is
Option A:	0
Option B:	<1
Option C:	>1
Option D:	1
Q15.	Catalyst present in reaction
Option A:	Changes position of equilibrium
Option B:	Does not changes position of equilibrium
Option C:	Increases rate of reaction
Option D:	Both changes position of equilibrium and increases rate of reaction
Q16.	Decomposition of calcium carbonate (solid state) gives carbon dioxide (gas state) and calcium oxide (solid state). Find degree of freedom
Option A:	0
Option B:	1
Option C:	2
Option D:	3
Q17.	The inerts present in the system will have no effect on the degree of completion if
Option A:	n is zero, that is, if there is no change in the number of moles during a reaction.
Option B:	n is equal to one
Option C:	$n < 0$
Option D:	$n > 0$
Q18.	When standard free energy change is greater than 40000KJ/Kmole
Option A:	Reaction is highly spontaneous
Option B:	Reaction very unfavorable
Option C:	Reaction is slow
Option D:	Reaction is moderate
Q19.	Degree of freedom of chemical reaction is given by (where F= degree of freedom, C = no of component/ species, P= number of phases, r = number of reactions, s = restriction)
Option A:	$F = C - P + 2 + r$
Option B:	$F = C + P + 2 - r$
Option C:	$F = C - P + 2 - r - s$
Option D:	$F = C - P + 2$

University of Mumbai
Examination 2020 under cluster PCOE (Lead College Short name)

Q20.	In any spontaneous process,
Option A:	only G decreases
Option B:	only A decreases
Option C:	both G and A decrease
Option D:	both G and A increase
Q21.	One tonne of refrigeration is approximately equal to
Option A:	212 kJ / min
Option B:	212 kW
Option C:	211 kW
Option D:	211 kJ / min
Q22.	For same pressure the saturation temperature of ammonia is
Option A:	higher than the saturation temperature of water
Option B:	lower than the saturation temperature of water
Option C:	same as the saturation temperature of water
Option D:	depends on quantity of ammonia
Q23.	For the same capacity of plant, the COP of the vapour absorption refrigeration system is
Option A:	lower than the COP of the vapour compression refrigeration system
Option B:	higher than the COP of the vapour compression refrigeration system
Option C:	same as the COP of the vapour compression refrigeration system
Option D:	cannot say
Q24.	In evaporation process of vapour compression refrigeration system
Option A:	heat is rejected from refrigerant to surroundings
Option B:	heat is rejected from surroundings to refrigerant
Option C:	only pressure change takes place
Option D:	only temperature change takes place
Q25.	In a refrigeration system, the expansion device is connected between the
Option A:	Compressor and condenser
Option B:	Condenser and absorber
Option C:	Condenser and evaporator
Option D:	Evaporator and compressor