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CHEMISTRY · EAPCET (EAMCET)

Solutions

Previous Year Questions with answers

214 questions · **139** papers · **2010–2026** · newest paper first

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What is in this PDF: every Solutions question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

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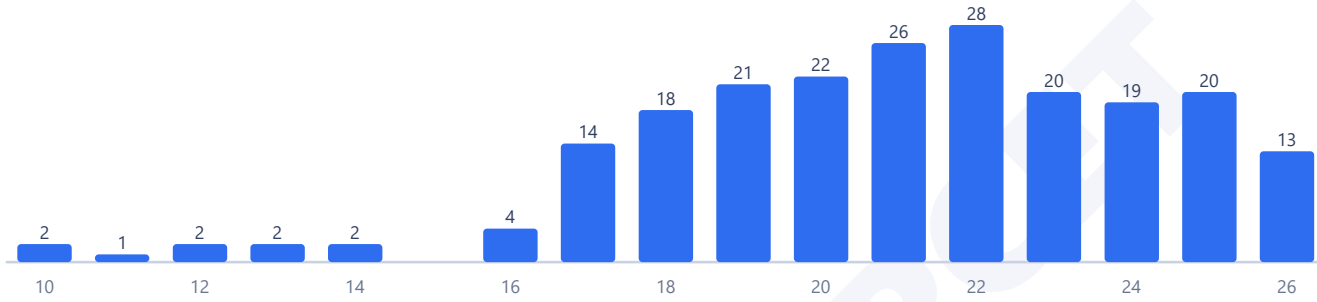
Chapter at a glance

3.2%	214	72 of 77	214 / 0
of Chemistry questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Falling: 1.1 questions per paper in 2024–2026 against 1.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 214 in 139 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2010–2026)

Colligative Properties	111
Vapour Pressure & Raoult's Law	69
van't Hoff Factor	34

How often it comes up

Solutions holds position 11 among the 31 chemistry chapters in the modern five-year testing period from 2022 to 2026. Looking back across our entire examination archive from 2010 through 2026, the chapter delivered 214 questions across 149 papers, appearing in 139 of those tests and claiming 3.6 percent of all chemistry questions with an average of 1.4 questions per paper. In the recent five-year timeframe from 2022 to 2026, it contributed 100 questions across 77 sittings, being present in 72 papers to maintain 1.3 questions per paper and a 3.2 percent subject share.

The chapter has featured in every exam year since 2022, though it was absent from five sittings during this period. When broken down by state board between 2022 and 2026, AP tests carried 68 questions across 48 papers (appearing in 45 papers, 1.4 questions per paper, 3.5 percent share), while TS papers assembled 32 questions across 29 papers (appearing in 27 papers, 1.1 questions per paper, 2.8 percent share).

During the older testing block between 2010 and 2021, papers featured 114 questions across 72 sittings (appearing in 67 tests), corresponding to 1.6 questions per paper and a 4.0 percent subject share. Across the most recent three exam years from 2024 to 2026, question banks included 52 questions across 46 sittings (with 42 papers containing questions), averaging 1.1 questions per test and 2.8 percent share. Comparing the early era with the last three years indicates a share trend that is down, while comparing the five-year recent window with the last three years shows the share is about the same.

Most-asked topics

Questions in Solutions distribute across three central physical chemistry domains:

- **Colligative Properties** forms the primary testing core with 111 questions overall and 51 during the recent period through 2026. Key problem formats evaluate relative lowering of vapour pressure, elevation in boiling point, depression in freezing point, and osmotic pressure of macromolecular or non-volatile solutes.

- **Vapour Pressure & Raoult's Law** supplied 69 questions across all years, with 37 occurring between 2022 and 2026. Questions explore ideal versus non-ideal liquid mixtures, positive and negative deviations from Raoult law, Henrys law constants for gaseous solubility, and vapour phase mole fraction calculations.
- **van't Hoff Factor** rounds out the syllabus with 34 questions across the archive and 12 in the recent period up to 2026. This area tests the degree of dissociation of strong and weak electrolytes, association of carboxylic acids in non-polar solvents, and anomalous molar masses.

What the questions look like

Examiners love numerical couplings between two distinct colligative phenomena. For example, a question might state the boiling point elevation of an aqueous solution and ask you to find its freezing point depression, requiring you to eliminate molality using the cryoscopic and ebullioscopic constants.

Another popular question type asks candidates to identify which equimolal solution among sodium chloride, calcium chloride, glucose, and aluminium sulphate has the highest freezing point or lowest boiling point. In these questions, calculating the effective particle concentration via the vant Hoff factor provides the swift route to the answer. You will also encounter Henrys law graphs plotting partial pressure against dissolved mole fraction where the slope directly equals the Henry constant.

How to practise it

Ensure you are comfortable converting between different concentration scales, specifically molality, molarity, and mole fraction. Because colligative properties rely on molality, practice computing solvent mass in kilograms quickly from solution density and solute molarity.

For electrolyte solutions, write down the dissociation equation cleanly. Relate the vant Hoff factor i to the degree of dissociation alpha using the formula i equals one plus open parenthesis n minus one close parenthesis alpha, where n represents the total number of ions produced per formula unit. For association into dimers, replace n with one half. Remember that osmotic pressure is the preferred experimental method for determining the molar masses of polymers and proteins because measurements occur near room temperature with measurable liquid heights.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

At 300 K , x moles of $\mathrm{CaCl_2}$ (i = 2.5 ; molar mass = 111 g $\mathrm{mol^{-1}}$) is dissolved in 2.5 L of water.

The osmotic pressure of resultant solution is 0.75 atm. What is $\Delta \mathrm{T_b}$ of solution ?

(density of water = 1g $\mathrm{mL^{-1}}$; $\mathrm{K_b}$ = 0.52 K kg $\mathrm{mol^{-1}}$; R = 0.08 L atm $\mathrm{mol^{-1}K^{-1}}$)

(A) 0.016 K
(B) 0.032 K
(C) 0.048 K
(D) 0.064 K

Answer: (A) 0.016 K · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 2 MCQ

What mass (in g) of glycerol is required to produce the same anti-freezing effect in 1.0 L of water as that of 20 g of NaCl in 1.0 L of water?
(molar mass of glycerol = $92\ \mathrm{g\ mol^{-1}}$, assume NaCl is 97% dissociated)

(A) 52.96
(B) 61.96
(C) 41.91
(D) 72.96

Answer: (B) 61.96 · The council's preliminary key

Q3 AP EAPCET 2026 · 15 May · Shift 1 MCQ

At $27^{\circ}\mathrm{C}$, x g of $\mathrm{C_6H_{12}O_6}$ (molar mass = 180 g $\mathrm{mol^{-1}}$) and y g of a non-volatile, non-electrolyte (molar mass = 92 g $\mathrm{mol^{-1}}$) were present separately in 1.0 L solutions. The osmotic pressure of two solutions is equal. What is x/y?

(A) $45/23$
(B) $23/45$
(C) $32/54$
(D) $54/32$

Answer: (A) $45/23$ · The council's preliminary key

Q4 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The boiling point of 1M aqueous solution of KCl (85% dissociation) having density 1.04 g $\mathrm{mL^{-1}}$ is
(Given: $\mathrm{K_b}$ ($\mathrm{H_2O}$) = 0.52 K kg $\mathrm{mol^{-1}}$, molar mass of KCl = 74.5 g $\mathrm{mol^{-1}}$)

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(A) $100.096^{\circ}\mathrm{C}$
(B) $100.996^{\circ}\mathrm{C}$
(C) $100.896^{\circ}\mathrm{C}$
(D) $100.796^{\circ}\mathrm{C}$

Answer: (B) $100.996^{\circ}\mathrm{C}$ · The council's preliminary key

Q5 AP EAPCET 2026 · 14 May · Shift 1 MCQ

1.0 g of a non-electrolytic and non-volatile solute (X) was dissolved in 20.4 g of water. At 760 mm Hg the freezing point of solution was found to be $-1.05^{\circ}\mathrm{C}$. The molar mass (in $\mathrm{g\ mol^{-1}}$) of the solute is
($\mathrm{K_f}$ ($\mathrm{H_2O}$) = 1.86 K kg $\mathrm{mol^{-1}}$)

(A) 96.8
(B) 43.4
(C) 86.8
(D) 48.4

Answer: (C) 86.8 · The council's preliminary key

Q6 AP EAPCET 2026 · 14 May · Shift 2 MCQ

At 300 K, a decimolar solution of potassium ferrocyanide is 50% dissociated. The osmotic pressure (in atm) of the solution is
($R = 0.082\ L\ atm\ K^{-1}mol^{-1}$)

(A) 6.83
(B) 3.87
(C) 7.38
(D) 7.83

Answer: (C) 7.38 · The council's preliminary key

Q7 AP EAPCET 2026 · 13 May · Shift 1 MCQ

An aqueous solution of a non-volatile and non-electrolytic solute boils at $100.5^{\circ}\mathrm{C}$. What will be the freezing point of the same solution?
(Given $K_b = 0.512\ K\ kg\ mol^{-1}$ and $K_f = 1.86\ K\ kg\ mol^{-1}$)

(A) $-2.816\ ^{\circ}\mathrm{C}$
(B) $-1.816\ ^{\circ}\mathrm{C}$
(C) $-0.908\ ^{\circ}\mathrm{C}$
(D) $-3.632\ ^{\circ}\mathrm{C}$

Answer: (B) $-1.816\ ^{\circ}\mathrm{C}$ · The council's preliminary key

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Q8 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The value of K_f (in $K\ kg\ mol^{-1}$) of a solvent (X) is four times the value of its K_b. $2g$ of a non-volatile, non-electrolytic solute A is dissolved in 200 g of solvent X. The ΔT_b of resultant solution in $Y\,K$. $4g$ of A is dissolved in 200 g of X and the ΔT_f of solution is Z K. What is the ratio of Y and Z?
(Molar mass of A=100 $g\ mol^{-1}$)

(A) $1:2$
(B) $1:4$
(C) $1:8$
(D) $1:16$

Answer: (C) $1:8$ · The council's preliminary key

Q9 TS EAPCET 2026 · 11 May · Shift 1 MCQ

Henry's law constant for argon at 298 K is 40 k bar. The mass of argon (in g) dissolved in 2.0 L water, when the pressure applied is 3.0 bar at the same temperature is

(Molar mass of argon = $40\,\mathrm{g\,mol^{-1}}$)

(A) 0.66
(B) 3.33
(C) 4.33
(D) 0.33

Answer: (D) 0.33 · The council's preliminary key

Q10 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If two liquids A and B have $\mathrm{P_A^\circ : P_B^\circ} = 1:2$ and have mole fraction in solution as $1:2$, then mole fraction of B in vapour phase is

(A) 0.2
(B) 0.8
(C) 0.4
(D) 0.6

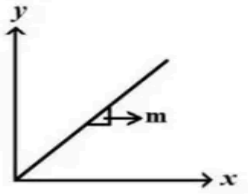
Answer: (B) 0.8 · The council's preliminary key

Q11 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The following graph is obtained by taking partial pressure of HCl (g) on y-axis and mole fraction of HCl (g) in cyclohexane on x-axis. The slope (m) of the graph is

(see the figure above)

The following graph is obtained by taking partial pressure of HCl (g) on y-axis and mole fraction of HCl (g) in cyclohexane on x-axis. The slope (m) of the graph is
HCl (వా) పాక్షిక పీడనాన్ని y-అక్షం పై మరియు సైక్లోహేక్సేన్‌లోని HCl (వా) మోల్ భాగము x-అక్షము పై తీసుకొన్నప్పుడు క్రింది గ్రాఫ్ లభించింది. గ్రాఫ్ యొక్క వాలు (m)



Options :

1. Henry constant (K_H) of cyclohexane
   సైక్లోహేక్సేన్ యొక్క హెన్రీ స్థిరాంకము (K_H)
2. K_H of HCl (g)
   HCl (వా) యొక్క K_H
3. Square root of K_H of HCl (g)
   HCl (వా) యొక్క K_H వర్గమూలము
4. $\frac{1}{K_H(HCl)}$

(A) Henry constant (K_H) of cyclohexane
(B) K_H of HCl (g)
(C) Square root of K_H of HCl (g)
(D) $\frac{1}{K_H(HCl)}$

Answer: (B) K_H of HCl (g) · The council's preliminary key

Q12 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Which of the following aqueous solution has highest freezing point?

(A) 0.1 m $Al_2(SO_4)_3$
(B) 0.1 m $BaCl_2$
(C) 0.1 m NH_4Cl
(D) 0.1 m $AlCl_3$

Answer: (C) 0.1 m NH_4Cl · The council's preliminary key

Q13 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The relative lowering of vapour pressure of an aqueous solution containing a non-volatile solute is 0.0125. The molality of the solution is

(A) 0.65 m
(B) 0.35 m
(C) 0.70 m
(D) 0.30 m

Answer: (C) 0.70 m · The council's preliminary key

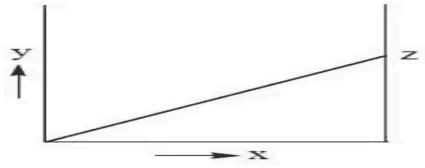
Q14 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The following graph is obtained for an ideal solution containing a non-volatile solute. x- and y-axis represent, respectively

(see the figure above)

The following graph is obtained for an ideal solution containing a non-volatile solute. x- and y-axis represent, respectively

ఒక అబాష్పశీల ద్రావితము ఉన్న ఆదర్శ ద్రావణానికి క్రింది గ్రాఫ్ లభించింది. x- మరియు y- అక్షాలు సూచించునవి వరుసగా



Options :

1. mole fraction of solute, vapour pressure of solute.
ద్రావితపు మోల్‌భాగము, ద్రావిత బాష్పపీడనము.

2. mole fraction of solvent, vapour pressure of solution.
ద్రావణి మోల్‌భాగము, ద్రావణం బాష్పపీడనము.

3. mole fraction of solute, vapour pressure of solution.
ద్రావితపు మోల్‌భాగము, ద్రావణం బాష్పపీడనము.

4. concentration of solution, vapour pressure of solution
ద్రావణపు గాఢత, ద్రావణం బాష్పపీడనము.

(A) mole fraction of solute, vapour pressure of solute.
(B) mole fraction of solvent, vapour pressure of solution.
(C) mole fraction of solute, vapour pressure of solution.
(D) concentration of solution, vapour pressure of solution

Answer: (B) mole fraction of solvent, vapour pressure of solution. · The council's preliminary key

Q15 AP EAPCET 2025 · 26 May · Shift 1 MCQ

At T(K), the vapour pressure of water is x kPa. What is the vapour pressure (in kPa) of 1 molal solution containing non-volatile solute ?

(A) $1.018\,x$
(B) $0.8\,x$
(C) $0.972\,x$
(D) $0.982\,x$

Answer: (D) $0.982\,x$ · The council's preliminary key

Q16 AP EAPCET 2025 · 26 May · Shift 1 MCQ

Elements X and Y form two non-volatile compounds (XY and $\mathrm{XY_3}$). When 10 g of XY is dissolved in 50 g of ethanol, the depression in freezing point ($\Delta \mathrm{T_f}$) was 5.333 K. When 10 g of $\mathrm{XY_3}$ is dissolved in

50 g of ethanol, the was (ΔT_f) 2.2857 K. What are the atomic weights of X and Y respectively ? (K_f = 2 K kg mol^{-1})

(A) 50 u, 50 u
(B) 25 u, 25 u
(C) 75 u, 100 u
(D) 25 u, 50 u

Answer: (D) 25 u, 50 u · The council's preliminary key

Q17 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The van't Hoff factor for 0.5 m aqueous CH_2FCOOH solution is 1.075. What is the experimentally observed ΔT_f (in K) for this solution ?

($K_f = 1.86$ K kg mol^{-1})

(A) 1.156
(B) 1.075
(C) 1.0
(D) 0.95

Answer: (C) 1.0 · The council's preliminary key

Q18 AP EAPCET 2025 · 24 May · Shift 1 MCQ

An aqueous solution containing 0.2 g of a non volatile solute 'A' in 21.5 g of water freezes at 272.814 K. If the freezing point of water is 273.16 K, the molar mass (in g mol^{-1}) of solute A is [$K_f(H_2O) = 1.86$ K kg mol^{-1}]

(A) 80
(B) 75
(C) 100
(D) 50

Answer: (D) 50 · The council's preliminary key

Q19 AP EAPCET 2025 · 24 May · Shift 1 MCQ

At T(K), the vapour pressure of x molal aqueous solution containing a non-volatile solute is 12.078 kPa. The vapour pressure of pure water at T(K) is 12.3 kPa. What is the value of x ?

(A) 10
(B) 1.018
(C) 0.1018
(D) 0.018

Answer: (B) 1.018 · The council's preliminary key

Q20 AP EAPCET 2025 · 23 May · Shift 1 MCQ

A solution of urea in water has a boiling point of $100.18^{\circ}\mathrm{C}$. What is the freezing point of the same solution, if $\mathrm{K_f}$ and $\mathrm{K_b}$ of water are 1.86 and 0.52 $\mathrm{K\ kg\ mol^{-1}}$, respectively ? (Boiling point of water = 100 °C)

(A) $-0.34\ ^{\circ}\mathrm{C}$
(B) $-0.22\ ^{\circ}\mathrm{C}$
(C) $-0.64\ ^{\circ}\mathrm{C}$
(D) $-0.32\ ^{\circ}\mathrm{C}$

Answer: (C) $-0.64\ ^{\circ}\mathrm{C}$ · The council's preliminary key

Q21 AP EAPCET 2025 · 23 May · Shift 1 MCQ

At T(K), the vapour pressure of pure benzene and toluene are 75 and 22 mm Hg respectively. 23.4 g of benzene and 64.4 g of toluene are mixed to form an ideal solution. If the vapours are in equilibrium with the liquid mixture, the mole fraction of toluene in vapour phase is (At.wt of C = 12; H = 1)

(A) 0.406
(B) 0.594
(C) 0.539
(D) 0.461

Answer: (A) 0.406 · The council's preliminary key

Q22 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Benzoic acid molecules undergo dimerisation in benzene. 2.44 g of benzoic acid when dissolved in 30 g of benzene caused depression in freezing point of 2 K. What is the percentage of association of it ? (Given $\mathrm{K_f(C_6H_6) = 5\ K\ kg\ mol^{-1}}$; molar mass of benzoic acid = $122\ \mathrm{g\ mol^{-1}}$)

(A) 80
(B) 70
(C) 60
(D) 90

Answer: (A) 80 · The council's preliminary key

Q23 AP EAPCET 2025 · 22 May · Shift 1 MCQ

At T(K), the vapour pressure of an aqueous solution of a non-volatile solute, whose mole fraction is 0.02 is found to be 34.65 mm Hg. What is the vapour pressure (in mm Hg) of pure water at the same temperature ?

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(A) 35.70
(B) 35.36
(C) 35.00
(D) 34.30

Answer: (B) 35.36 · The council's preliminary key

Q24 AP EAPCET 2025 · 22 May · Shift 2 MCQ

1.95 g of non-volatile and non-electrolyte solute dissolved in 100 g of benzene lowered the freezing point of it by 0.64 K. The molar mass of the solute (in g mol^{-1}) ($\mathrm{K_f(C_6H_6)}$ = 5.12 K kg mol^{-1})

(A) 240
(B) 156
(C) 165
(D) 265

Answer: (B) 156 · The council's preliminary key

Q25 AP EAPCET 2025 · 22 May · Shift 2 MCQ

At 298 K, 0.714 moles of liquid A is dissolved in 5.555 moles of liquid B. The vapour pressure of the resultant solution is 475 torr. The vapour pressure of pure liquid A at the same temperature is 280.7 torr. What is the vapour pressure of pure liquid B in torr ?

(A) 486
(B) 550
(C) 514
(D) 500

Answer: (D) 500 · The council's preliminary key

Q26 AP EAPCET 2025 · 21 May · Shift 1 MCQ

A solution containing 7.5 g of urea (molar mass = 60 g mol^{-1}) in 1 kg of water freezes at the same temperature as another solution containing 15 g of solute X, in the same amount of water. The molar mass of X (g mol^{-1}) is

(A) 60
(B) 180
(C) 120
(D) 240

Answer: (C) 120 · The council's preliminary key

Q27 AP EAPCET 2025 · 21 May · Shift 2 MCQ

A centi molar solution of acetic acid is 50% dissociated at $27\ ^{\circ}\mathrm{C}$. The osmotic pressure of the solution (in atm) is ($\mathrm{R} = 0.083\ \mathrm{L\ atm\ K^{-1}\ mol^{-1}}$)

(A) 0.37
(B) 3.7
(C) 0.037
(D) 0.73

Answer: (A) 0.37 · The council's preliminary key

Q28 AP EAPCET 2025 · 21 May · Shift 2 MCQ

At 300 K vapour pressure of a pure liquid, 'A' is 70 mm Hg. It forms an ideal solution with another liquid 'B'. The mole fraction of B in the solution is 0.2 and total vapour pressure of solution is 84 mm Hg at same temperature. What is the vapour pressure (in mm) of pure liquid B at 300 K ?

(A) 140
(B) 70
(C) 280
(D) 560

Answer: (A) 140 · The council's preliminary key

Q29 TS EAPCET 2025 · 4 May · Shift 1 MCQ

In a mixture of liquids A and B, if the mole fractions of component A in vapour phase and liquid mixture are x_1 and x_2 respectively, then the total vapour pressure of liquid mixture is (where $\mathrm{P^{\circ}_A}$ and $\mathrm{P^{\circ}_B}$ are the vapour pressures of pure A and B)

(A) $\frac{\mathrm{P^{\circ}_B}\,x_1}{x_2}$
(B) $\frac{\mathrm{P^{\circ}_B}\,x_2}{x_1}$
(C) $\frac{\mathrm{P^{\circ}_A}\,x_2}{x_1}$
(D) $\frac{\mathrm{P^{\circ}_A}\,x_1}{x_2}$

Answer: (C) $\frac{\mathrm{P^{\circ}_A}\,x_2}{x_1}$ · The council's preliminary key

Q30 TS EAPCET 2025 · 3 May · Shift 1 MCQ

Observe the following data given in the table.

($\mathrm{K_H}$ = Henry's law constant)

Gas	$\mathrm{CO_2}$	Ar	HCHO	$\mathrm{CH_4}$
$\mathrm{K_H}$ (k bar at 298 K)	1.67	40.3	1.83×10^{-5}	0.413

The correct order of their solubility in water is

(A) $CO_2 > CH_4 > HCHO > Ar$
(B) $Ar > HCHO > CH_4 > CO_2$
(C) $HCHO > CH_4 > CO_2 > Ar$
(D) $CO_2 > HCHO > CH_4 > Ar$

Answer: (C) $HCHO > CH_4 > CO_2 > Ar$ · The council's preliminary key

Q31 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Two liquids 'A' and 'B' form an ideal solution. At 300 K, the vapour pressure of a solution containing 1 mole of 'A' and 3 moles of 'B' is 550 mm Hg. At the same temperature, if one more mole of 'B' is added to the solution, the vapour pressure of solution increases to 560 mm Hg. Then the ratio of vapour pressures of A and B in their pure state is

(A) $1:3$
(B) $3:1$
(C) $2:3$
(D) $3:2$

Answer: (C) $2:3$ · The council's preliminary key

Q32 TS EAPCET 2025 · 2 May · Shift 1 MCQ

Observe the following statements

Statement – I: The boiling point of 0.1 M urea solution is less than that of 0.1 M KCl solution

Statement – II: Elevation of boiling point is inversely proportional to molar mass of solute

The correct answer is

(A) Both statements I and II are correct
(B) Statement I is correct, but statement II is not correct
(C) Statement I is not correct, but statement II is correct
(D) Both statements I and II are not correct

Answer: (A) Both statements I and II are correct · The council's preliminary key

Q33 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The osmotic pressure (in atm) of an aqueous solution containing 0.01 mol of $NaCl$ (degree of dissociation 0.94) and 0.03 mol of glucose in 500 mL at $27\,^{\circ}C$ is
$(R = 0.082\,L\ atm\ K^{-1}mol^{-1})$

(A) 2.43
(B) 4.23
(C) 3.24
(D) 3.42

Answer: (A) 2.43 · The council's preliminary key

Q34 AP EAPCET 2024 · 23 May · Shift 1 MCQ

At 300 K, the vapour pressures of A and B liquids are 500 and 400 mm Hg respectively. Equal moles of A and B are mixed to form an ideal solution. The mole fraction of A and B in vapor state is respectively

(A) 0.5, 0.5
(B) 0.666, 0.333
(C) 0.444, 0.555
(D) 0.555, 0.444

Answer: (D) 0.555, 0.444 · The council's preliminary key

Q35 AP EAPCET 2024 · 23 May · Shift 1 MCQ

Two statements are given below

Statement – I: Liquids A and B form a non-ideal solution with positive deviation. The interactions between A and B are weaker than A-A and B-B interactions

Statement – II: For an ideal solution, $\Delta_{mix}H = 0$; $\Delta_{mix}V = 0$

The correct answer is

(A) Both Statements -I and Statement -II are correct
(B) Both Statements -I and Statement -II are not correct
(C) Statement-I is correct but Statement-II is not correct
(D) Statement-I is not correct but Statement-II is correct

Answer: (A) Both Statements -I and Statement -II are correct · The council's preliminary key

Q36 AP EAPCET 2024 · 22 May · Shift 1 MCQ

Benzoic acid undergoes dimerization in benzene. x g of benzoic acid (molar mass $122\ \text{g mol}^{-1}$) is dissolved in 49 g of benzene. The depression in freezing point is 1.12 K. If degree of association of acid is 88 %, what is the value of x? (K_f for benzene = $4.9\ \text{K kg mol}^{-1}$)

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(A) 2.44
(B) 1.22
(C) 3.66
(D) 4.88

Answer: (A) 2.44 · The council's preliminary key

Q37 AP EAPCET 2024 · 22 May · Shift 1 MCQ

At T(K) two liquids A and B form an ideal solution. The vapour pressures of pure liquids A and B at that temperature are 400 and 600 mm Hg respectively. If the mole fraction of liquid B is 0.3 in the mixture, the mole fractions of A and B in vapour phase respectively are

(A) 0.391, 0.609
(B) 0.509, 0.491
(C) 0.609, 0.391
(D) 0.491, 0.509

Answer: (C) 0.609, 0.391 · The council's preliminary key

Q38 AP EAPCET 2024 · 22 May · Shift 2 MCQ

At 290 K, a vessel (I) contains equal moles of three liquids (A, B, C). The boiling points of A, B and C are 350, 373 and 308 K respectively. Vessel (I) is heated to 300 K and vapours were collected into vessel (II). Identify the correct statements. (Assume vessel (I) contains liquids and vapours and vessel (II) contains only vapours)

I. Vessel – I is rich in liquid B

II. Vessel – II is rich in vapour of C

III. The vapour pressures of A, B, C in Vessel (I) at 290 K follows the order C > A > B

(A) I, II, III
(B) I, II only
(C) I, III only
(D) II, III only

Answer: (A) I, II, III · The council's preliminary key

Q39 AP EAPCET 2024 · 22 May · Shift 2 MCQ

At 300 K, 6 g of urea was dissolved in 500 mL of water. What is the osmotic pressure (in atm) of resultant solution? ($\mathrm{R} = 0.082\ \mathrm{L\ atm\ K^{-1}\ mol^{-1}}$)

(C = 12; N = 14; O = 16; H = 1)

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(A) 0.492
(B) 2.46
(C) 4.92
(D) 49.2

Answer: (C) 4.92 · The council's preliminary key

Q40 AP EAPCET 2024 · 22 May · Shift 2 MCQ

In water, which of the following gases has the highest Henry's law constant at 293 K?

(A) N_2
(B) O_2
(C) He
(D) H_2

Answer: (C) He · The council's preliminary key

Q41 AP EAPCET 2024 · 21 May · Shift 1 MCQ

A solution was prepared by dissolving 0.1 mole of a non-volatile solute in 0.9 moles of water. What is the relative lowering of vapour pressure of solution?

(A) 0.9
(B) 0.5
(C) 0.1
(D) 0.05

Answer: (C) 0.1 · The council's preliminary key

Q42 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The following graph is obtained for vapour pressure (in atm) (on y-axis) and T (in K) (on x-axis) for aqueous urea solution and water. What is the boiling point (in K) of urea solution?

(Atmospheric pressure = 1 atm)

(see the figure above)

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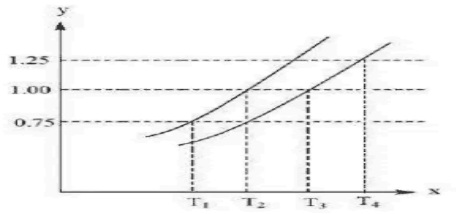
The following graph is obtained for vapour pressure (in atm) (on y-axis) and T (in K) (on x-axis) for aqueous urea solution and water. What is the boiling point (in K) of urea solution?
(Atmospheric pressure = 1 atm)
యూరియా జల ద్రావణము మరియు నీరులకు, బాష్ప పీడనము (atm లలో) (y-అక్షం పై) మరియు T (K లలో) (x-అక్షం పై) లకు క్రింది గ్రాఫ్ లభించింది. యూరియా ద్రావణపు బాష్పీభవన స్థానం (K లలో) ఎంత? (వాతావరణ పీడనము 1.0 atm)



Options :

1. T_1
2. T_2
3. T_3
4. T_4

(A) T_1
(B) T_2
(C) T_3
(D) T_4

Answer: (C) T_3 · The council's preliminary key

Q43 AP EAPCET 2024 · 21 May · Shift 2 MCQ

Given below are two statements

Statement I: Liquids A & B form a non-ideal solution with negative deviation. The interactions between A and B are weaker than A-A & B-B interactions

Statement II: In reverse osmosis, the applied pressure must be higher than the osmotic pressure of solution

The correct answer is

(A) Both Statement-I and Statement-II are correct
(B) Both Statement-I and Statement-II are not correct
(C) Statement-I is correct but Statement-II is not correct
(D) Statement-I is not correct but Statement-II is correct

Answer: (D) Statement-I is not correct but Statement-II is correct · The council's preliminary key

Q44 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The osmotic pressure of sea water is 1.05 atm. Four experiments were carried as shown in table.

In which of the following experiments, pure water can be obtained in part-II of vessel.

(see the figure above)

Table

Expt. No.	Pressure applied in part-I of Vessel	Pressure applied in part-II of Vessel
I	10 atm	-
II	-	10 atm
III	15 atm	-
IV	-	15 atm

The osmotic pressure of sea water is 1.05 atm. Four experiments were carried as shown in table. In which of the following experiments, pure water can be obtained in part-II of vessel.
సముద్ర నీటి ద్రవాభిసరణ పీడనము 1.05 atm. పట్టికలో చూపిన విధంగా నాలుగు ప్రయోగాలు గావించారు. క్రింది ఏ ప్రయోగాలలో, పాత్రలోని II భాగంలో శుద్ధమైన నీరు లభించును?

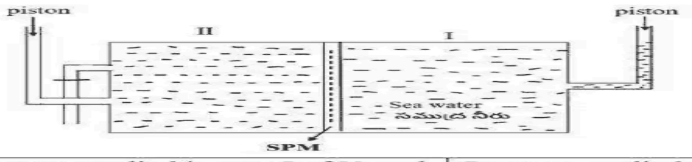


Table (పట్టిక)

Expt. No.	Pressure applied in part-I of Vessel	Pressure applied in part-II of Vessel
I	10 atm	-
II	-	10 atm
III	15 atm	-
IV	-	15 atm

Options :

1. I, III only
I, III మాత్రమే

2. II, IV only
II, IV మాత్రమే

3. I, II, III, IV

4. IV only
IV మాత్రమే

(A) I, III only
(B) II, IV only
(C) I, II, III, IV
(D) IV only

Answer: (A) I, III only · The council's preliminary key

Q45 AP EAPCET 2024 · 20 May · Shift 2 MCQ

A non – volatile solute is dissolved in water. The ΔT_b of resultant solution is 0.052 K. What is the freezing point of the solution (in K)?

(K_b of water = 0.52 K kg mol^{-1}; K_f of water = 1.86 K kg mol^{-1}; Freezing point of water = 273 K)

(A) 272.628
(B) 273.186
(C) 273.000
(D) 272.814

Answer: (D) 272.814 · The council's preliminary key

Q46 AP EAPCET 2024 · 19 May · Shift 2 MCQ

The ΔT_b value for 0.01 m KCl solution is 0.01 K. What is the Van't Hoff factor?

(K_b for water = 0.52 K kg mol^{-1})

(A) 1.92
(B) 1.72
(C) 0.96
(D) 0.86

Answer: (A) 1.92 · The council's preliminary key

Q47 AP EAPCET 2024 · 18 May · Shift 1 MCQ

At 293 K, methane gas was passed into 1 L of water. The partial pressure of methane is 1 bar. The number of moles of methane dissolved in 1 L water is

(K_H of methane = 0.4 kbar)

(A) 1.38
(B) 1.38×10^{-2}
(C) 1.38×10^{-3}
(D) 1.38×10^{-1}

Answer: (D) 1.38×10^{-1} · The council's preliminary key

Q48 TS EAPCET 2024 · 11 May · Shift 1 MCQ

At 300 K, the vapour pressure of toluene and benzene are 3.63 kPa and 9.7 kPa respectively. What is the composition of vapour in equilibrium with the solution containing 0.4 mole fraction of toluene? (Assume the solution is ideal)

(A) 0.40
(B) 0.60
(C) 0.80
(D) 0.20

Answer: (D) 0.20 · The council's preliminary key

Q49 TS EAPCET 2024 · 10 May · Shift 1 MCQ

At 300 K, 0.06 kg of an organic solute is dissolved in 1 kg water. The vapour pressure of solution at 300 K is 3.768 kPa. If vapour pressure of water at that temperature is 3.78 kPa, what is the molar mass of the organic solute (in $\mathrm{g\ mol}^{-1}$)?

(Assume the solution is dilute)

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(A) 180
(B) 120
(C) 340
(D) 260

Answer: (C) 340 · The council's preliminary key

Q50 TS EAPCET 2024 · 10 May · Shift 2 MCQ

At T(K), 0.1 moles of a non –volatile solute was dissolved in 0.9 moles of a volatile solvent. The vapour pressure of pure solvent is 0.9 bar. What is the vapour pressure (in bar) of solution?

(A) 0.89
(B) 0.81
(C) 0.79
(D) 0.71

Answer: (B) 0.81 · The council's preliminary key

Q51 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Distilled water boils at 373.15 K and freezes at 273.15 K. A solution of glucose in distilled water boils at 373.202 K. What is the freezing point (in K) of the same solution?
(For water, $\mathrm{K_b} = 0.52\,\mathrm{K\,kg\,mol^{-1}}$, $\mathrm{K_f} = 1.86\,\mathrm{K\,kg\,mol^{-1}}$)

(A) 273.15
(B) 273.0
(C) 272.964
(D) 273.336

Answer: (C) 272.964 · The council's preliminary key

Q52 TS EAPCET 2024 · 9 May · Shift 2 MCQ

Dry air contains 79% $\mathrm{N_2}$ and 21% $\mathrm{O_2}$. At T(K), if Henry's law constants for $\mathrm{N_2}$ and $\mathrm{O_2}$ in water are 8.57×10^4 atm and 4.56×10^4 atm, the ratio of mole fractions of $\mathrm{N_2}$ and $\mathrm{O_2}$ dissolved in water at 1 atm is

(A) $4 : 1$
(B) $1 : 4$
(C) $2 : 1$
(D) $1 : 2$

Answer: (C) $2 : 1$ · The council's preliminary key

Q53 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Which of the following in not correct?

Which of the following in not correct?

క్రింది వానిలో ఏది సరియైనది కాదు?

Options :

1. n- hexane + n- heptane — Ideal solution

   n - హెక్సేన్ + n - హెప్టేన్ — ఆదర్శ ద్రావణం

2. $C_2H_5OH + H_2O$ — Positive deviation from Raoult's Law

   $C_2H_5OH + H_2O$ — రౌల్ట్ నియమం నుండి ధనాత్మక విచలనం

3. $CHCl_3$ +  — Negative deviation from Raoult's Law

   $CHCl_3$ +  — రౌల్ట్ నియమం నుండి ఋణాత్మక విచలనం

4. C_2H_5OH +  — Ideal solution

   C_2H_5OH +  — ఆదర్శ ద్రావణం

(A) n- hexane + n- heptane – Ideal solution

(B) $C_2H_5OH + H_2O$ – Positive deviation from Raoult's Law

(C) $CHCl_3$ + *(see the figure above)* – Negative deviation from Raoult's Law

(D) C_2H_5OH + *(see the figure above)* – Ideal solution

Answer: (D) C_2H_5OH + *(see the figure above)* **– Ideal solution** · The council's preliminary key

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Q54 AP EAPCET 2023 · 19 May · Shift 1 MCQ

What is the depression of freezing point, when mole fraction of non-electrolyte solute in aqueous solution is 0.01 ? (K_f of H_2O = $1.86\ K\ kg\ mol^{-1}$)

(A) $1.246\ K$

(B) $1.380\ K$

(C) $1.528\ K$

(D) $1.043\ K$

Answer: (D) $1.043\ K$ · The council's preliminary key

Q55 AP EAPCET 2023 · 18 May · Shift 1 MCQ

What is the boiling point of solution of 0.1m KCl?

K_b of water is $0.52\ K\ kg\ mol^{-1}$. ($\alpha = 100\%$) (water boil at 373 K)

(A) 100.104 K
(B) 373.104 K
(C) 273.104 K
(D) 373.052 K

Answer: (B) 373.104 K · The council's preliminary key

Q56 AP EAPCET 2023 · 18 May · Shift 2 MCQ

At 293 K, the Henry law constant in water for N_2 and O_2 are 76.48 k bar and 34.86 k bar respectively. What is the ratio of mole fractions of N_2 and O_2 in water? (Assume partial pressures of N_2 and O_2 same at 293 K)

(A) 2.19
(B) 0.95
(C) 0.60
(D) 0.45

Answer: (D) 0.45 · The council's preliminary key

Q57 AP EAPCET 2023 · 18 May · Shift 2 MCQ

At 298 K, if the vapour pressure of pure liquids toluene, benzene, chloroform and dichloromethane are 60, 160, 200 and 415 torr respectively. Then which liquid is having high boiling point?

(A) Toluene
(B) Benzene
(C) Chloroform
(D) Dichloromethane

Answer: (A) Toluene · The council's preliminary key

Q58 AP EAPCET 2023 · 17 May · Shift 1 MCQ

6 g of a non-volatile solute (x) is dissolved in 100 g of water. The relative lowering of vapour pressure of resultant solution is 0.006. What is the molar mass (in $g\ mol^{-1}$) of x?

(A) 60
(B) 360
(C) 100
(D) 180

Answer: (D) 180 · The council's preliminary key

Q59 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If the osmotic pressure of cane sugar solution is 2.46 atm at 27 °C, then what is the concentration (in $mol\ L^{-1}$) of the solution ($R = 0.0821\ L\ atm\ mol^{-1}\ K^{-1}$)

(A) 0.1
(B) 0.2
(C) 0.01
(D) 0.02

Answer: (A) 0.1 · The council's preliminary key

Q60 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A solution is formed by the combination of two liquids such as dichloromethane and chloroform. The partial pressures of dichloromethane and chloroform in solution are 285.5 and 62.4 mm Hg respectively. What is the total pressure of the solution?

(A) 223.1 mm Hg
(B) 347.9 mm Hg
(C) 357.9 mm Hg
(D) 337.9 mm Hg

Answer: (B) 347.9 mm Hg · The council's preliminary key

Q61 AP EAPCET 2023 · 16 May · Shift 1 MCQ

What is the osmotic pressure (in atm) of 0.02M aqueous glucose solution at 300 K?

$(\mathrm{R} = 0.082\ \mathrm{L\ atm\ mol^{-1}K^{-1}})$

(A) $\frac{1}{0.492}$
(B) 0.492
(C) 0.988
(D) $\frac{1}{0.988}$

Answer: (B) 0.492 · The council's preliminary key

Q62 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The elevation in the boiling point of aqueous urea solution is 0.104 K. What is its ΔT_f (in K) value? (for Water $K_b = 0.52\ \mathrm{K\ kg\ mol^{-1}}$, $K_f = 1.86\ \mathrm{K\ kg\ mol^{-1}}$)

(A) 0.0186
(B) 0.186
(C) 0.372
(D) 0.0372

Answer: (C) 0.372 · The council's preliminary key

Q63 AP EAPCET 2023 · 16 May · Shift 2 MCQ

When 10^{-3} M solution of glucose in water, freezes at -0.0186 °C, then at what temperature 10^{-3} M solution of NaCl will freeze?

(A) 0 °C
(B) 0.186 °C
(C) -0.186 °C
(D) -0.0372 °C

Answer: (D) -0.0372 °C · The council's preliminary key

Q64 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Molal depression constant ($\mathrm{K_f}$) is dependent on

(A) Nature of solvent
(B) Nature of solute
(C) Number of moles of solvent
(D) Number of moles of solute

Answer: (A) Nature of solvent · The council's preliminary key

Q65 AP EAPCET 2023 · 15 May · Shift 2 MCQ

What is the van't Hoff factor of Ferric Sulphate (Assume 100% ionization)

(A) 2
(B) 4
(C) 5
(D) 3

Answer: (C) 5 · The council's preliminary key

Q66 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Which of the following does not belong to an ideal solution?

(A) $\Delta \mathrm{H_{mix}} = 0$
(B) $\Delta \mathrm{V_{mix}} = 0$
(C) Obeys Raoult's law over the entire range of concentration
(D) Does not obey Raoult's law

Answer: (D) Does not obey Raoult's law · The council's preliminary key

Q67 TS EAMCET 2023 · 14 May · Shift 1 MCQ

At 50 °C, the vapour pressure of pure benzene is 268 torr. The number of moles of non-volatile solute per mole of benzene required to prepare a solution having a vapour pressure of 167 torr at the same temperature is
(molar mass of benzene=78 g $\mathrm{mol^{-1}}$)

(A) 0.505
(B) 0.705
(C) 0.605
(D) 0.405

Answer: (C) 0.605 · The council's preliminary key

Q68 TS EAMCET 2023 · 14 May · Shift 2 MCQ

An aqueous solution of a non-volatile solute boils at $100.17\ ^{\circ}\mathrm{C}$. The temperature at which this solution will freeze (in $^{\circ}\mathrm{C}$) is

$(K_b(\mathrm{H_2O}) = 0.512\ ^{\circ}\mathrm{C\ kg\ mol^{-1}},\ K_f(\mathrm{H_2O}) = 1.86\ ^{\circ}\mathrm{C\ kg\ mol^{-1}})$

(A) -0.62
(B) -0.512
(C) -1.24
(D) -1.86

Answer: (A) -0.62 · The council's preliminary key

Q69 TS EAMCET 2023 · 13 May · Shift 1 MCQ

'x' g of urea (molar mass $60\ \mathrm{g\,mol^{-1}}$) is completely dissolved in 'y' g of pure water and the solution boiled at 373.202 K. If the boiling point of pure water at 1.013 bar is 373.15 K, then $x : y$ is

$(\mathrm{K_b(H_2O)} = 0.52\ \mathrm{K\,kg\,mol^{-1}})$

(A) 6.0×10^{-3}
(B) 3.0×10^{-3}
(C) 9.0×10^{-3}
(D) 4.5×10^{-3}

Answer: (A) 6.0×10^{-3} · The council's preliminary key

Q70 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Liquids A and B form an ideal solution. The vapour pressures of A and B are 50 and 32mm Hg respectively at 300K. One mole of liquid A is mixed with 1 mole of liquid B. What is the approximate mole fraction of A in vapour phase?

(A) 0.39
(B) 0.50
(C) 0.25
(D) 0.61

Answer: (D) 0.61 · The council's preliminary key

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Q71 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The vapour pressure of a pure liquid A is 70 torr at 300 K. It forms an ideal solution with another liquid B. The mole fraction of B is 0.2 and total vapour pressure of the solution is 84 torr at the same temperature. The vapour pressure of pure liquid B (in torr) is

(A) 140
(B) 90
(C) 120
(D) 80

Answer: (A) 140 · The council's preliminary key

Q72 TS EAMCET 2023 · 12 May · Shift 2 MCQ

At 300 K, the osmotic pressure of a decinormal solution of sodium chloride is 4.82 atm. The degree of dissociation of sodium chloride is $x \times 10^{-2}$. The value of x is

(R = 0.082 L atm $\mathrm{K^{-1}mol^{-1}}$)

(A) 90
(B) 96
(C) 93
(D) 88

Answer: (B) 96 · The council's preliminary key

Q73 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

A liquid mixture is an ideal solution, if
a) It obeys ideal gas equation
b) It obeys Raoult's law at all concentrations
c) Solute $-$ solute, solute $-$ solvent and solvent $-$ solvent interactions are similar

(A) a only
(B) a, b only
(C) b, c only
(D) c only

Answer: (C) b, c only · The council's preliminary key

Q74 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The freezing point of equimolal aqueous solution will be highest for

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(A) $C_6H_5 - \overset{+}{N}H\overset{-}{N}H_3\,Cl$

(B) $Ba(NO_3)_2$

(C) $LaCl_3$

(D) $C_6H_{12}O_6$

Answer: (D) $C_6H_{12}O_6$ · The council's preliminary key

Q75 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A solvent freezes at 17 °C and it has latent heat of fusion $180\ J\ g^{-1}$. The molal depression constant of the solvent is [units of $K_f = K\ kg\ mol^{-1}$]

(A) 3.88

(B) 3.55

(C) 3.70

(D) 4.77

Answer: (A) 3.88 · The council's preliminary key

Q76 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The Henry's law constant for the solubility of N_2 gas in water at 298 K is $1 \times 10^{+5}$ atm. The mole fraction of air is 0.8. The number of moles of N_2 from air dissolved in 10 moles of water at 298 K and 5 atm pressure is

(A) 4×10^{-5}

(B) 4×10^{-4}

(C) 5×10^{-4}

(D) 4×10^{-6}

Answer: (B) 4×10^{-4} · The council's preliminary key

Q77 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

What is the effect of external pressure on the osmotic pressure (OP) of a solution?

(A) OP decreases with increase of pressure

(B) OP decreases initially, then increases

(C) OP remained nearly same with increase / decrease of external pressure

(D) OP increases with increase of pressure

Answer: (C) OP remained nearly same with increase / decrease of external pressure · The council's preliminary key

Q78 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Calculate the quantity of CO_2 required to prepare 1 L of soda water when the soda water was packed under 2 atm of CO_2.

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[Henry's law constant for CO_2 is 1.67×10^8 Pa]

(A) 5.98 g
(B) 1.21 g
(C) 2.9 g
(D) 67.1 g

Answer: (C) 2.9 g · The council's preliminary key

Q79 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Which of the following substances show the highest colligative properties?

(A) 0.1 M $BaCl_2$
(B) 0.1 M $AgNO_3$
(C) 0.1 M urea
(D) 0.1 M $(NH_4)_3PO_4$

Answer: (D) 0.1 M $(NH_4)_3PO_4$ · The council's preliminary key

Q80 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Which of the following are correct for an ideal solution?
a) $\Delta V_{mix} = 0$
b) $V_{solvent} + V_{solute} = V_{solution}$
c) $\Delta H_{mix} = 0$
d) $H_2O + CO_2 \rightarrow H_2CO_3$ is an example of ideal solution.

(A) a, b only
(B) b, c only
(C) a, b, c only
(D) a, b, c, d

Answer: (C) a, b, c only · The council's preliminary key

Q81 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

At $0\ ^\circ C$, urea solution has an osmotic pressure of 400 mm. On dilution by x times, its osmotic pressure decreased to 100 mm at $20\ ^\circ C$. The dilution factor x is approximately

(A) 4.3
(B) 2
(C) 5
(D) 6.8

Answer: (A) 4.3 · The council's preliminary key

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Q82 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Which of the following is/are "not correct" for $CH_3OH + CH_3COOH$ mixture solution?

a) $\Delta H_{mix} < 0$

b) Does not obey Raoult's law

c) $\Delta H_{mix} > 0$

d) An example of ideal solution

(A) d only

(B) a, c only

(C) a, b, c only

(D) c, d only

Answer: (C) a, b, c only · The council's preliminary key

Q83 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Henry's law is valid for

A) Ammonia gas dissolution in water

B) O_2 gas dissolution in unsaturated blood

C) O_2 dissolution in water

D) CO_2 dissolution in water

(A) A and B

(B) B and C

(C) C and D

(D) B and D

Answer: (C) C and D · The council's preliminary key

Q84 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

At T (K), the partial pressure of dissolved oxygen in 1 L water is 1 bar. The concentration of oxygen is ppm is (K_H of O_2 at T(K) is 50 kbar)

(A) 71.0

(B) 35.50

(C) 17.75

(D) 81.10

Answer: (B) 35.50 · The council's preliminary key

Q85 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

At T(K) the molarity of CO_2(in $mol\ L^{-1}$) in 200 mL of soda water packed under a pressure of 3.4 bar is (K_H of CO_2 in water is $1.7X10^3$ bar at T(K))

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(A) $2.0X10^{-2}$
(B) $1.11X10^{-1}$
(C) $2.22X10^{-1}$
(D) $5.1X10^{-2}$

Answer: (B) $1.11X10^{-1}$ · The council's preliminary key

Q86 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The depression in freezing point of solution of molality $0.01\ \text{mol kg}^{-1}$ is highest with respect to which of the solvent? (Whose K_f is given is brackets)

(A) Water (1.86)
(B) Benzene (5.12)
(C) Carbon tetrachloride (31.8)
(D) Cyclohexane (20.0)

Answer: (C) Carbon tetrachloride (31.8) · The council's preliminary key

Q87 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

1.8 g of glucose (molar mass $180\ \text{g mol}^{-1}$) is dissolved in 0.1 kg of water. The freezing point of the solution (in °C) is (K_f for water = $1.86\ \text{K kg mol}^{-1}$)

(A) $+0.186$
(B) -0.372
(C) -0.186
(D) $+0.372$

Answer: (C) -0.186 · The council's preliminary key

Q88 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

For which of the following liquid mixtures $\Delta_{mix}H = 0$ and $\Delta_{mix}V = 0$?

(A) ethyl chloride, ethyl bromide
(B) ethanol, acetone
(C) phenol, aniline
(D) chloroform, acetone

Answer: (A) ethyl chloride, ethyl bromide · The council's preliminary key

Q89 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

At 298K, the vapour pressure of pure water is 25 torr. The vapour pressure of water, when 12 g of urea (molar mass, $60\ \text{g mol}^{-1}$) and 36 g of glucose (molar mass, $180\ \text{g mol}^{-1}$) is dissolved in 100g of water at the same temperature (in torr) is

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(A) 25.02
(B) 24.12
(C) 23.92
(D) 23.32

Answer: (D) 23.32 · The council's preliminary key

Q90 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Which of the following solution has the highest freezing point?

(A) 0.1 mol KCl in 1 kg water
(B) 0.1 mol K_2SO_4 in 1 kg water
(C) 0.1 mol Urea in 1 kg water
(D) 30 g of glucose in1 kg water

Answer: (C) 0.1 mol Urea in 1 kg water · The council's preliminary key

Q91 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

At 298 K, vapour pressures of two pure liquids A and B are 200 and 400 mm Hg respectively. If mole fractions of A and B in solution are 0.7 and 0.3 respectively. What is the mole fraction of B in vapour phase?

(A) 0.279
(B) 0.721
(C) 0.538
(D) 0.462

Answer: (D) 0.462 · The council's preliminary key

Q92 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The freezing point depression of a solution containing 0.6 g of urea (molar mass=60 g mol^{-1}) in 100g of benzene (in K) is (K_f of CH_3COOH = 4.0 K Kg mol^{-1})

(A) 0.30
(B) 0.58
(C) 0.40
(D) 0.24

Answer: (C) 0.40 · The council's preliminary key

Q93 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

0.05 mole of a non-volatile solute is dissolved in 500 g of water. What is the depression in freezing point of resultant solution? ($K_f(H_2O)$ = 1.86 K kg mol^{-1})

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(A) 0.047 K
(B) 0.372 K
(C) 0.093 K
(D) 0.186 K

Answer: (D) 0.186 K · The council's preliminary key

Q94 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Which of the following form an ideal solution?
(I) Chloroethane and bromoethane
(II) Benzene and toluene
(III) n - Hexane and n - heptane
(IV) Phenol and aniline

(A) I & II only
(B) I, II & III only
(C) II, III & IV only
(D) I & IV only

Answer: (B) I, II & III only · The council's preliminary key

Q95 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Which of the following condition is correct for reverse osmosis?

[C = Concentration of solution in $\mathrm{mol\,L^{-1}}$; T = Temperature in Kelvin scale; n = no of moles of solute]

(A) $\mathrm{P_{ext} = CRT}$
(B) $\mathrm{P_{ext} > CRT}$
(C) $\mathrm{P_{ext} < CRT}$
(D) $\mathrm{P_{ext} > nRT}$

Answer: (B) $\mathrm{P_{ext} > CRT}$ · The council's preliminary key

Q96 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Which of the following pair of solutions is isotonic?

A. 18 g/L of glucose of solution and 6 g/L of Urea solution

B. 10 g/L of glucose solution and 10 g/L of Urea solution

C. 0.01 M NaOH solution and 0.02 M glucose solution

D. 0.01M NaCl solution and 0.01 M glucose solution

(Assume that NaCl undergoes complete dissociation)

(A) A and B
(B) A and C
(C) B and D
(D) B and C

Answer: (B) A and C · The council's preliminary key

Q97 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

At T (K) x g of a non-volatile solid (molar mass 78 $\mathrm{g\,mol^{-1}}$) when added to 0.5 kg water, lowered its freezing point by 1.0°C. What is x (in g)? (K_f of water at T(K)= 1.86 $\mathrm{K\,Kg\,mol^{-1}}$)

(A) 10.48
(B) 20.96
(C) 41.92
(D) 5.24

Answer: (B) 20.96 · The council's preliminary key

Q98 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Assertion (A) : Blood cells collapse when suspended in saline water
Reason (R): Cell membrane dissolves in saline water

(A) Both (A) and (R) are correct and R is the correct explanation of A
(B) Both (A) and (R) are correct, but R is not the correct explanation of A
(C) (A) is correct but (R) is not correct
(D) (A) is incorrect but (R) is correct

Answer: (C) (A) is correct but (R) is not correct · The council's preliminary key

Q99 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A solution containing 6.0 g of urea is isotonic with a solution containing 10g of a non-electrolytic solute X. The molar mass of X (in $\mathrm{g\,mol^{-1}}$) is

(A) 50.0
(B) 100
(C) 75.0
(D) 68.0

Answer: (B) 100 · The council's preliminary key

Q100 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

x % (w/v) solution of urea is isotonic with 4% (w/v) solution of a non-volatile solute of molar mass 120 $\mathrm{g\,mol^{-1}}$. The value of x is

(A) 2
(B) 4
(C) 3
(D) 5

Answer: (A) 2 · The council's preliminary key

Q101 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

For a solution made up of n-hexane and n-heptane, which of the following conditions hold?

(A) $\Delta_{mix}H = 0\ ;\ \Delta_{mix}V < 0$
(B) $\Delta_{mix}H = 0\ ;\ \Delta_{mix}V = 0$
(C) $\Delta_{mix}H > 0\ ;\ \Delta_{mix}V = 0$
(D) $\Delta_{mix}H < 0\ ;\ \Delta_{mix}V < 0$

Answer: (B) $\Delta_{mix}H = 0\ ;\ \Delta_{mix}V = 0$ · The council's preliminary key

Q102 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A 25% solution of cane-sugar (mol mass= $342\ \text{g mol}^{-1}$) is isotonic with 5% solution of a substance A. Then find the molecular weight of A?

(A) $6.84\ \text{g mol}^{-1}$
(B) $68.4\ \text{g mol}^{-1}$
(C) $25\ \text{g mol}^{-1}$
(D) $684\ \text{g mol}^{-1}$

Answer: (B) $68.4\ \text{g mol}^{-1}$ · The council's preliminary key

Q103 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Henrys law constant for CO_2 in water is $1.67 \times 10^8\ \text{Pa}$. Calculate the approximate quantity of CO_2 in $500\ \text{ml}$ of soda water when packed under $5\ \text{atm}$ CO_2 at $298\ \text{K}$.

(A) $3.7\ \text{g}$
(B) $1.84\ \text{g}$
(C) $2.2\ \text{g}$
(D) $4.4\ \text{g}$

Answer: (A) $3.7\ \text{g}$ · The council's preliminary key

Q104 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Which of the following is not an ideal solution?

(A) Benzene and Toluene
(B) Chloro-benzene and 1,2-dichloro benzene
(C) Methyl iodide and Isopropanol
(D) Ethyl bromide and Methyl bromide

Answer: (C) Methyl iodide and Isopropanol · The council's preliminary key

Q105 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The elevation in boiling point of a solution of $10\ g$ of a binary electrolyte (of molecular mass 100) in $100\ g$ of water is ΔT_b. Then the value of K_b for water is _____

(A) $\frac{\Delta T_b}{2}$
(B) 10
(C) $10\ \Delta T_b$
(D) $\frac{\Delta T_b}{10}$

Answer: (A) $\frac{\Delta T_b}{2}$ · The council's preliminary key

Q106 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A gas X is dissolved in water at 2 bar pressure. Its mole fraction in the solution is 0.02. Find the mole fraction of water in the solution when the pressure of the gas is doubled at the same temperature.

(A) 0.04
(B) 0.98
(C) 0.96
(D) 0.02

Answer: (C) 0.96 · Checked by our team

Q107 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Which among the following is a colligative property?

(A) Surface tension
(B) Osmotic pressure
(C) Optical rotation
(D) Viscosity

Answer: (B) Osmotic pressure · The council's preliminary key

Q108 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$2\ g$ of a non-electrolyte solute (molar mass is $500\ g\ mol^{-1}$) was dissolved in $57.3\ g$ of xylene. If the freezing point depression constant K_f of Xylene is $4.3\ K\ kg\ mol^{-1}$. Then the depression in freezing point of Xylene is _____

(A) $57.3\ K$
(B) $0.3\ K$
(C) $4.3\ K$
(D) $0.002\ K$

Answer: (B) $0.3\ K$ · The council's preliminary key

Q109 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A 0.6 % solution of urea (molecular mass= 60) would be isotonic with _____

(A) 0.1 M glucose solution
(B) 0.6 % solution of glucose
(C) 0.1 M KCl solution
(D) 0.6 % KCl solution

Answer: (A) 0.1 M glucose solution · The council's preliminary key

Q110 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If the K_H values for $Ar_{(g)}$, $CO_{2(g)}$, $HCHO_{(g)}$ and $CH_{4(g)}$ respectively are 40.39, 1.67, 1.83×10^{-5} and 0.413, then identify the correct increasing order of their solubilities.

(A) $HCHO < CH_4 < CO_2 < Ar$
(B) $HCHO < CO_2 < CH_4 < Ar$
(C) $Ar < CO_2 < HCHO < CH_4$
(D) $Ar < CO_2 < CH_4 < HCHO$

Answer: (D) $Ar < CO_2 < CH_4 < HCHO$ · The council's preliminary key

Q111 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If two liquids A and B form a minimum boiling azeotrope at some specific composition, then which statement among the following is correct?

(A) $A - B$ molecular interactions are stronger than $A - A$ and $B - B$ interactions.
(B) The total vapour pressure of the mixture is greater than that corresponding to an ideal solution.
(C) There is a slight decrease in volume when the two components are mixed.
(D) ΔH_{mix} will have a negative value.

Answer: (B) The total vapour pressure of the mixture is greater than that corresponding to an ideal solution. · The council's preliminary key

Q112 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

The vapour pressure of a solvent decreased by 20 mm of Hg when a non-volatile solute was added to the solvent. The mole-fraction of the solute in the solution is 0.5. What should be the mole-fraction of the solvent for the decrease in the vapour pressure needs to be 10 mm of Hg?

(A) $\frac{3}{4}$
(B) $\frac{2}{3}$
(C) $\frac{1}{4}$
(D) $\frac{3}{2}$

Answer: (A) $\frac{3}{4}$ · The council's preliminary key

Q113 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Which of the following will form an ideal solution?

(A) C_2H_5OH & H_2O
(B) HNO_3 & H_2O
(C) $CHCl_3$ & CH_3COCH_3
(D) C_6H_6 & $C_6H_5CH_3$

Answer: (D) C_6H_6 & $C_6H_5CH_3$ · The council's preliminary key

Q114 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The molal elevation constant is the ratio of Elevation in boiling point to _____

(A) Molarity
(B) Molality
(C) Mole fraction of solute
(D) Mole fraction of solvent

Answer: (B) Molality · The council's preliminary key

Q115 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Which condition is not satisfied by an ideal solution?

(A) Both $\Delta_{mix}H = 0$ and $\Delta_{mix}S = 0$
(B) Obeyance on Raoult's law
(C) Both $\Delta_{mix}H = 0$ and $\Delta_{mix}V = 0$
(D) $\Delta_{mix}H = 0$

Answer: (A) Both $\Delta_{mix}H = 0$ and $\Delta_{mix}S = 0$ · The council's preliminary key

Q116 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A solution of urea (molar mass $60\ \text{g mol}^{-1}$) boils at 100.20°C at the atmospheric pressure. if K_f and K_b for water are 1.86 and $0.512\ \text{K Kg mol}^{-1}$ respectively. The freezing point of the solution will be _____

(A) $-0.654^{\circ}\mathrm{C}$
(B) $+0.654^{\circ}\mathrm{C}$
(C) $-0.726^{\circ}\mathrm{C}$
(D) $+0.726^{\circ}\mathrm{C}$

Answer: (C) $-0.726^{\circ}\mathrm{C}$ · The council's preliminary key

Q117 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

Which of the following mixture form an ideal solution?

(A) $\mathrm{CCl_4 + C_7H_8}$
(B) $\mathrm{CHCl_3 + C_6H_6}$
(C) $\mathrm{H_2O + CH_3OH}$
(D) $\mathrm{n-C_6H_{14} + n-C_7H_{16}}$

Answer: (D) $\mathrm{n-C_6H_{14} + n-C_7H_{16}}$ · The council's preliminary key

Q118 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The freezing point of an aqueous solution containing 25g of ethanol in 1000g of $\mathrm{H_2O}$ is [K_f=1.86 K kg $\mathrm{mol^{-1}}$]

(A) 0.25 °C
(B) 0.5 °C
(C) -1.5 °C
(D) -1 °C

Answer: (D) -1 °C · The council's preliminary key

Q119 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Calculate the molal depression constant of a solution, which freezes at $15^{\circ}\mathrm{C}$. The latent heat of fusion is $180.7\ \mathrm{J\,g^{-1}}$

(A) $3.81\ \mathrm{K\,molal^{-1}}$
(B) $0.381\ \mathrm{K\,molal^{-1}}$
(C) $1.90\ \mathrm{K\,molal^{-1}}$
(D) $0.19\ \mathrm{K\,molal^{-1}}$

Answer: (A) $3.81\ \mathrm{K\,molal^{-1}}$ · The council's preliminary key

Q120 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

pH of a $0.1\mathrm{M}$ monobasic acid is 2. Its osmotic pressure at a given temperature T (K) is (Given that the effective concentration for osmotic pressure is $(1+\alpha)\times$ concentration of acid; α is the dissociation factor)

(A) RT
(B) $0.11\ RT$
(C) $0.01\ RT$
(D) $0.001\ RT$

Answer: (B) $0.11\ RT$ · The council's preliminary key

Q121 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Match the following.
A) Ebullioscopic constant I) Depression of freezing point
B) Cryoscopic constant II) Total pressure is the sum of partial pressures of the components
C) Henry's law III) Elevation of boiling point
D) Dalton's law IV) Solubility of a gas in liquid
The correct match is

(A) A-III, B-I, C-II, D-IV
(B) A-I, B-III, C-II, D-IV
(C) A-III, B-I, C-IV, D-II
(D) A-I, B-III, C-IV, D-II

Answer: (C) A-III, B-I, C-IV, D-II · The council's preliminary key

Q122 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

On mixing urea, the boiling point of H_2O changed to $100.5\ ^\circ C$. Calculate the freezing point of the solution, if K_f of water is $1.87\ K.kg.mol^{-1}$ and K_b of water is $0.52\ K.kg.mol^{-1}$

(A) $-1\ ^\circ C$
(B) $-0.5\ ^\circ C$
(C) $-1.8\ ^\circ C$
(D) $0\ ^\circ C$

Answer: (C) $-1.8\ ^\circ C$ · The council's preliminary key

Q123 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A 3 ml of solution was made by dissolving 20 mg of protein at 0 °C. The osmotic pressure of the resulting solution is 3.8 torr. The molecular weight of the protein is approximately (in g / mol)

(A) 300
(B) 3×10^5
(C) 3×10^4
(D) 3×10^3

Answer: (C) 3×10^4 · The council's preliminary key

Q124 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

When salt is added to water, which of the following statement is true?

(A) Boiling point decreases
(B) Boiling point increases
(C) Boiling point remain constant
(D) Freezing point increases

Answer: (B) Boiling point increases · The council's preliminary key

Q125 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Given
Sol A: Phenol and aniline
Sol B : Chloroform and acetone
Which of following is correct as per Raoult's law?

(A) Sol A shows –ve and B shows +ve deviation
(B) Both solutions A and B show –ve deviation
(C) Sol A shows +ve and B shows –ve deviation
(D) Both solutions show +ve deviation

Answer: (B) Both solutions A and B show –ve deviation · The council's preliminary key

Q126 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The trend in the colligative properties for the same concentration of $\mathrm{BaCl_2}$, $\mathrm{MgCl_2}$ and NaCl, respectively, is

(A) $\mathrm{NaCl} > \mathrm{MgCl_2} > \mathrm{BaCl_2}$
(B) $\mathrm{NaCl} > \mathrm{BaCl_2} > \mathrm{MgCl_2}$
(C) $\mathrm{MgCl_2} = \mathrm{BaCl_2} < \mathrm{NaCl}$
(D) $\mathrm{MgCl_2} = \mathrm{BaCl_2} > \mathrm{NaCl}$

Answer: (D) $\mathrm{MgCl_2} = \mathrm{BaCl_2} > \mathrm{NaCl}$ · The council's preliminary key

Q127 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

K_H values for $\mathrm{H_2}$, $\mathrm{CO_2}$, $\mathrm{CH_4}$ and $\mathrm{O_2}$ at 298 K are 71.18, 1.67, 41.85 and 34.86 $Kbar$. respectively. Arrange these gases in the increasing order of their solubility.

(A) $\mathrm{H_2} < \mathrm{CH_4} < \mathrm{O_2} < \mathrm{CO_2}$
(B) $\mathrm{H_2} < \mathrm{CH_4} < \mathrm{CO_2} < \mathrm{O_2}$
(C) $\mathrm{CO_2} < \mathrm{O_2} < \mathrm{CH_4} < \mathrm{H_2}$
(D) $\mathrm{CO_2} < \mathrm{CH_4} < \mathrm{O_2} < \mathrm{H_2}$

Answer: (A) $\mathrm{H_2} < \mathrm{CH_4} < \mathrm{O_2} < \mathrm{CO_2}$ · Checked by our team

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Q128 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Which of the following solutions has the lowest freezing point?

(A) 1 M Urea
(B) 1 M Na_2SO_4
(C) 1 M NaCl
(D) 1 M $Al_2(SO_4)_3$

Answer: (D) 1 M $Al_2(SO_4)_3$ · Checked by our team

Q129 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Which of the following units is useful in relating concentration of solution with its vapour pressure?

(A) Mole fraction
(B) Parts per million
(C) Mass percentage
(D) Molality

Answer: (A) Mole fraction · The council's preliminary key

Q130 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M $MgCl_2$ solution is _____ (M.W. of $MgCl_2$ = 95, M.W. of glucose= 180)

(A) The same
(B) About twice
(C) About three times
(D) About six times

Answer: (C) About three times · The council's preliminary key

Q131 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Match the item given in Column-I (method used for determining colligative property) and Column-II (for the corresponding colligative property) and find the correct order.
Column-I: a. Beckmann method; b. Ostwald-Walker method; c. Berkeley-Hartley method; d. Landsberger method
Column-II: i. Osmotic pressure; ii. Elevation in B.P.; iii. Depression in F.P.; iv. Relative lowering of Vapour pressure

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(A) (a - ii), (b - iv), (c - iii), (d - i)
(B) (a - i), (b - iv), (c - ii), (d - iii)
(C) (a - ii), (b - iii), (c - iv), (d - i)
(D) (a - iii), (b - iv), (c - i), (d - ii)

Answer: (D) (a - iii), (b - iv), (c - i), (d - ii) · The council's preliminary key

Q132 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

160 g of non-volatile solute 'A' is dissolved in 54 ml of water at 373 K. What is the vapor pressure of aqueous solution of A. (given molecular weight of A= 160 g.mol^{-1})

(A) 760 Torr
(B) 720 Torr
(C) 570 Torr
(D) 450 Torr

Answer: (C) 570 Torr · The council's preliminary key

Q133 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Which of the following pairs of solutions is expected to be isotonic at same temperature?

(A) 0.1 M Urea and 0.1 M NaCl
(B) 0.1 M Glucose and 0.2 M NaCl
(C) 0.1 M NaCl and 0.1 M $\mathrm{CH_3COOH}$
(D) 0.1 M NaCl and 0.1 M $\mathrm{KNO_3}$

Answer: (D) 0.1 M NaCl and 0.1 M $\mathrm{KNO_3}$ · The council's preliminary key

Q134 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Which of the following changes decrease the vapor pressure of water kept in a sealed vessel?

(A) Decreasing the quantity of water
(B) Adding salt to water
(C) Decreasing the volume of the vessel to one-half
(D) Keeping the temperature of water constant

Answer: (B) Adding salt to water · The council's preliminary key

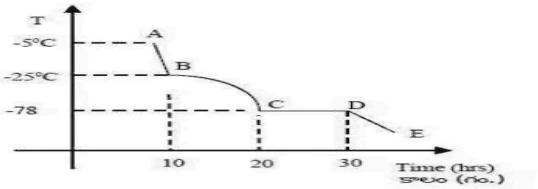
Q135 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

A beaker containing a mixture of liquid A and liquid B, in equilibrium with each other, is cooled very slowly. If point 'D' on the graph is where solidification of both liquids is complete, how many different phases coexist along line 'CD' if freezing point of liquid B and liquid A are -25°C and -78°C respectively.
(see the figure above)

Orientation : Vertical

A beaker containing a mixture of liquid A and liquid B, in equilibrium with each other, is cooled very slowly. If point 'D' on the graph is where solidification of both liquids is complete, how many different phases coexist along line 'CD' if freezing point of liquid B and liquid A are $-25°C$ and $-78°C$ respectively.

ఒక దానితో ఒకటి సమతాస్థితిలో ఉన్న A, B ద్రవాల మిశ్రమము గల బీకరును చాలా నెమ్మదిగా చల్ల బరచినారు. ఆ ప్రక్రియకు సంబంధించిన రేఖాపాతములో D బిందువు వద్ద రెండు ద్రవాలూ పూర్తిగా ఘనీభవించాయి. ద్రవము B మరియు ద్రవము A యొక్క ఘనీభవన స్థానాలు వరుసగా $-25°C$ మరియు $-78°C$ అయితే CD రేఖ గుండా కలిసి ఉండే వివిధ దశలు ఎన్ని?



Options :

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1. 1
2. 2
3. 3
4. 4

(A) 1
(B) 2
(C) 3
(D) 4

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q136 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The observed molar mass determined for Na_2SO_4 by freezing point depression method is 50.0 g/mol. The molecular weight of Na_2SO_4 is 142. What will be the degree of dissociation α for Na_2SO_4 in water?

(A) 0.23
(B) 0.18
(C) 0.78
(D) 0.92

Answer: (D) 0.92 · Official TGCHE final key

Q137 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Relative lowering of vapor pressure of a dilute solution is 0.5. What is the mole fraction of the non-volatile solute?

(A) 0.5
(B) 0.25
(C) 1
(D) 2

Answer: (A) 0.5 · Official TGCHE final key

Q138 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

The solubility product of a sparingly soluble AB_2 salt is $2.56 \times 10^{-4}\ M^3$ at $25^\circ C$. The K_f of water is $1.8\ K\ kg\ mol^{-1}$. The depression in freezing point of a standard solution of AB_2 is

(A) $0.432\ K$
(B) $0.216\ K$
(C) $0.108\ K$
(D) $13.824\ K$

Answer: (B) $0.216\ K$ · Official TGCHE final key

Q139 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

15% aqueous solution of glucose (molecular weight = 180 g/mol) is isotonic with 8% aqueous solution containing an unknown non-dissociable solute. What is the molecular weight of the unknown solute?

(A) 108
(B) 96
(C) 84
(D) 9.6

Answer: (B) 96 · Official TGCHE final key

Q140 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

The vapour pressure of pure water is 23 mmHg. The vapour pressure of an aqueous solution which contains 10 mass percent of solute 'A' having molecular weight 50 is

(A) 0.003 atm
(B) 34.5 atm
(C) 22 atm
(D) 0.028 atm

Answer: (D) 0.028 atm · Official TGCHE final key

Q141 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A 1.17% solution of solute A is isotonic with 7.2% solution of glucose. If the molecular weight of solute A is 58.5, the value of van't Hoff factor, 'i' is

(A) 2
(B) 3
(C) 4
(D) 5

Answer: (A) 2 · Official TGCHE final key

Q142 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A mixture of 3.0 mol of Na_2O and 1.5 mol of KO_2 is dissolved in 1000 mL of water. The vapour pressure of the solution in Torr, at 100 °C is

(A) 740
(B) 760
(C) 580
(D) 608

Answer: (C) 580 · Checked by our team

Q143 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

A^{2+}, B^{2+} and C^{-} form an ionic complex like $A_{x-2}[B(C)_x]_2$. If the complex is 75% dissociated in a solvent with i = 4, the coordination number of B is

(A) 3
(B) 4
(C) 5
(D) 6

Answer: (C) 5 · Official TGCHE final key

Q144 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The freezing point of equimolal aqueous solution will be highest for

(A) $BaCl_2$
(B) $Ca(NO_3)_2$
(C) Urea
(D) Na_2SO_4

Answer: (C) Urea · Official TGCHE final key

Q145 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

The freezing point depression of 0.001 M of $A_xB_y[Fe(CN)_6]$ is 5.58×10^{-3} K. If the oxidation state of Fe is +2 and $K_f = 1.86\ K\ kg\ mol^{-1}$, then the total number of possibilities for different types of A and B cations are

(A) 1
(B) 2
(C) 3
(D) 4

Answer: (C) 3 · Official TGCHE final key

Q146 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

When 2.44 grams of benzoic acid (C_6H_5COOH) dissolved in 25 grams of benzene, it shows depression of freezing point equal to 2.2 K. Molal depression constant of benzene is $5.0\ K\ kg\ mol^{-1}$. What is the percentage association of acid, if it forms dimer in solution?

(A) 50%
(B) 77%
(C) 95%
(D) 90%

Answer: (D) 90% · Official TGCHE final key

Q147 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Correct order of osmotic pressure of the following solutions is
(i) 30 gm L^{-1} of glucose
(ii) 60 gm L^{-1} of NH_2CONH_2
(iii) 80 gm L^{-1} of glucose
(iv) 58.5 gm L^{-1} of NaCl

(A) (ii) < (i) < (iii) < (iv)
(B) (i) < (iii) < (ii) < (iv)
(C) (i) < (iv) < (ii) < (iii)
(D) (iii) < (i) < (iv) < (ii)

Answer: (B) (i) < (iii) < (ii) < (iv) · Official TGCHE final key

Q148 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The osmotic pressure of 0.1 M monobasic acid of pH 3 at 27 °C is

(A) 2.42 atm
(B) 242.4 atm
(C) 60.6 atm
(D) 50.9 atm

Answer: (A) 2.42 atm · Official TGCHE final key

Q149 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The vapour pressure of pure $\mathrm{CCl_4}$ (Molar mass = 154 g $\mathrm{mol^{-1}}$) and $\mathrm{SnCl_4}$ (Molar mass = 170 g $\mathrm{mol^{-1}}$) at 25 °C are 115.0 and 238.0 Torr respectively. Assuming ideal behavior, calculate the total approximate vapour pressure in Torr of a solution containing 10 g of $\mathrm{CCl_4}$ and 15 g of $\mathrm{SnCl_4}$.

(A) 185.85
(B) 190.0
(C) 180.7
(D) 182.1

Answer: (A) 185.85 · Official TGCHE final key

Q150 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A camphor sample melts at 176 °C. K_f for camphor is 40 K kg $\mathrm{mol^{-1}}$. A solution of 0.02 g of a hydrocarbon in 0.8 g of camphor melts at 156.77 °C. The hydrocarbon is made up of 92.3% of carbon. What is the molecular formula of the hydrocarbon?

(A) $\mathrm{C_6H_6}$
(B) $\mathrm{C_{12}H_{12}}$
(C) $\mathrm{C_4H_4}$
(D) $\mathrm{C_8H_8}$

Answer: (C) $\mathrm{C_4H_4}$ · Official TGCHE final key

Q151 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Calculate the depression in the freezing point of a solution containing 0.1 g of $\mathrm{K_3[Fe(CN)_6]}$ in 100 g of $\mathrm{H_2O}$? (molecular weight of $\mathrm{K_3[Fe(CN)_6]}$ = 329, $K_f = 1.86\ \mathrm{K\ kg\ mol^{-1}}$)

(A) 0
(B) 1.223
(C) 0.0226
(D) 0.226

Answer: (C) 0.0226 · Official TGCHE final key

Q152 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A solution of 17.1 w% of sucrose (molar mass = 342 $\mathrm{g\ mol^{-1}}$) is isotonic with a x w% solution of oxalic acid (molar mass = 90 $\mathrm{g\ mol^{-1}}$). Assume the degree of dissociation of oxalic acid as 0.01. What is x?

(A) 9
(B) 0.45
(C) 4.41
(D) 0.90

Answer: (C) 4.41 · Official TGCHE final key

Q153 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If a solute associates in a solvent, its experimentally calculated molar mass using boiling point elevation method will be

(A) Half of the actual value
(B) Will remain same as actual value
(C) One fourth of the actual value
(D) Higher than the actual value

Answer: (D) Higher than the actual value · Official TGCHE final key

Q154 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The freezing point of solution containing 10 mL of non-volatile and non-electrolyte liquid "A" in 500 g of water is $-0.413\ ^{\circ}$C. If K_f of water is 1.86 K kg mol^{-1} and the molecular weight of A = 60 g mol^{-1}, what is the density of the solution in g mL^{-1}?
(Assume $\Delta_{\text{mix}}V = 0$)

(A) 1.13
(B) 1.3
(C) 0.90
(D) 0.993

Answer: (D) 0.993 · Official TGCHE final key

Q155 TS EAMCET 2019 · 3 May · Shift 2 MCQ

How many grams of glucose are required to prepare an aqueous solution of glucose having a vapor pressure of 23.324 mm Hg at 25°C in 100 g of water? The vapor pressure of pure water at 25°C is 23.8 mm Hg. (Molar mass of glucose = 180 g mol^{-1})

(A) 20.4
(B) 10.3
(C) 5.4
(D) 7.4

Answer: (A) 20.4 · Official TGCHE final key

Q156 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If 0.1 M solution of NaCl is isotonic with 1.1 w% urea solution, the degree of ionisation of NaCl is (Molar masses of urea and NaCl are 60 and 58.5 g mol^{-1} respectively)

(A) 2
(B) 0.83
(C) 1
(D) 1.83

Answer: (B) 0.83 · Official TGCHE final key

Q157 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

At 298 K, the vapour pressure of a solution of 7.5 g of non-volatile solute in 90 g of water is 2.8 kPa. If 18 g of water is added to this solution the vapour pressure becomes 2.81 kPa at same temperature, the molar mass of solute in $\mathrm{g\,mol}^{-1}$ is

(A) 17.5
(B) 68.2
(C) 71.5
(D) 51.8

Answer: (C) 71.5 · Official APSCHE final key

Q158 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

At T(K), the vapour pressures of pure liquids A and B are 100 mm and 160 mm respectively. An ideal solution is formed by mixing 2 moles of A and 3 moles of B at the same temperature. The mole fraction of A and B in the vapour state respectively are

(A) 0.706, 0.294
(B) 0.294, 0.706
(C) 0.40, 0.60
(D) 0.60, 0.40

Answer: (B) 0.294, 0.706 · Official APSCHE final key

Q159 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

At $300\ \mathrm{K}$ an ideal solution is formed by mixing $460\ \mathrm{g}$ of toluene with $390\ \mathrm{g}$ benzene. If the vapour pressure of pure toluene and benzene at $300\ \mathrm{K}$ are 32 and $40\ \mathrm{mm}$ respectively, the mole fraction of toluene in vapour phase is

(A) 0.196
(B) 0.588
(C) 0.294
(D) 0.444

Answer: (D) 0.444 · Official APSCHE final key

Q160 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If aqueous solution contains 9% and 1% (W/W) of two non-volatile, non-electrolytes X(molecular weight 180) and Y(molecular weight 50) respectively, the boiling point of solution in $^{\circ}\mathrm{C}$ approximately is $(\mathrm{K_b} = 0.52\ \mathrm{K\,kg\,mol^{-1}})$

(A) 101.4
(B) 100.4
(C) 102.4
(D) 100.8

Answer: (B) 100.4 · Official APSCHE final key

Q161 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

An ideal solution of hexane and heptane at 30 °C has a vapour pressure of 95 bar with hexane mole fraction 0.305. In vapour phase hexane mole fraction is 0.555. The vapour pressures of pure hexane and heptane at 30 °C respectively in bar are

(A) 172.9, 60.9
(B) 60.8, 172.9
(C) 30.4, 86.5
(D) 86.5, 30.4

Answer: (A) 172.9, 60.9 · Official APSCHE final key

Q162 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The vapour pressure of a solution (b) as a function of temperature (a) is plotted as a graph for two solutions of same molar concentration along with water as shown below. A, B and C are respectively.
(see the figure above)

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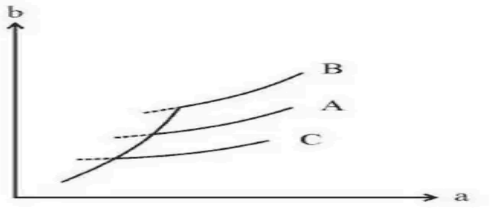
Question Number : 142 Question Id : 1874634622 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The vapour pressure of a solution (b) as a function of temperature (a) is plotted as a graph for two solutions of same molar concentration along with water as shown below. A, B and C are respectively.

నీటితోపాటు సమాన మోలార్ గాఢతలు గల రెండు ద్రావణాల బాష్పపీడనాల (b) ను ఉష్ణోగ్రత (a) ప్రమేయంగా, క్రింద ఇచ్చిన విధంగా గ్రాఫ్ గీసారు. A, B మరియు C లు వరుసగా



Options :

1. $H_2NCONH_2, H_2O, NaCl$
2. $H_2O, H_2NCONH_2, NaCl$
3. $NaCl, H_2O, H_2NCONH_2$
4. $NaCl, H_2NCONH_2, H_2O$

(A) $H_2NCONH_2, H_2O, NaCl$

(B) $H_2O, H_2NCONH_2, NaCl$

(C) $NaCl, H_2O, H_2NCONH_2$

(D) $NaCl, H_2NCONH_2, H_2O$

Answer: (A) $H_2NCONH_2, H_2O, NaCl$ · Official APSCHE final key

Q163 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A solution is prepared by dissolving 10 g of a non-volatile solute (molar mass, 'M' $g\,mol^{-1}$) in 360 g of water. What is the molar mass in $g\,mol^{-1}$ of solute if the relative lowering of vapour pressure of solution is 5×10^{-3}?

(A) 199

(B) 99.5

(C) 299

(D) 149.5

Answer: (B) 99.5 · Official APSCHE final key

Q164 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

x g of $MgSO_4$ ($i = 1.8$) is in 2.5 L of solution has an osmotic pressure of 2.463 atm. at 27 °C. What is the value of x in g?

(A) 33.2
(B) 6.6
(C) 3.3
(D) 16.6

Answer: (D) 16.6 · Official APSCHE final key

Q165 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

The vapour pressures of chloroform ($CHCl_3$), dichloromethane (CH_2Cl_2) at 298 K are 200 mm Hg and 415 mm Hg respectively. An ideal solution is prepared by mixing 59.75 g of $CHCl_3$ and 21.25 g of CH_2Cl_2, the mole fractions of chloroform and dichloromethane in vapour phase respectively are

(A) 0.509, 0.491
(B) 0.491, 0.509
(C) 0.201, 0.799
(D) 0.799, 0.201

Answer: (B) 0.491, 0.509 · Official APSCHE final key

Q166 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

The elevation in boiling point of an aqueous solution of NaCl is $0.01\ ^\circ C$. If its van't Hoff factor is 1.92, the molality of NaCl solution is
(K_b for water $= 0.52\ K\ kg\ mol^{-1}$)

(A) 0.01 m
(B) 0.001 m
(C) 0.005 m
(D) 0.02 m

Answer: (A) 0.01 m · Official APSCHE final key

Q167 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

6 g of a mixture of naphthalene ($C_{10}H_8$) and anthracene ($C_{14}H_{10}$) is dissolved in 300 g of benzene. If the depression in freezing point is 0.70 K, the composition of naphthalene and anthracene in the mixture respectively in g are
(molal depression constant of benzene is 5.1 K kg mol^{-1})

(A) 2.60, 3.40
(B) 3.40, 2.60
(C) 2.90, 3.10
(D) 3.10, 2.90

Answer: (B) 3.40, 2.60 · Official APSCHE final key

Q168 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

1.2 mL of acetic acid having density $1.06\ \mathrm{gcm^{-3}}$ is dissolved in 1 litre of water. The depression in freezing point observed for this concentration of acid was $0.041^{\circ}\mathrm{C}$. The van't Hoff factor of the acid is ($\mathrm{K_f}$ of water = $1.86\ \mathrm{K\,kgmol^{-1}}$)

(A) 0.41
(B) 1.04
(C) 0.96
(D) 1.54

Answer: (B) 1.04 · Official APSCHE final key

Q169 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

100 mL of 1.5% (w/v) solution of urea is found to have an osmotic pressure of 6.0 atm and 100 mL of 3.42% (w/v) solution of cane sugar is found to have an osmotic pressure of 2.4 atm. If the two solutions are mixed, the osmotic pressure of the resulting solution in atm is
(Assume that there is no reaction between urea and cane sugar)

(A) 8.4
(B) 16.8
(C) 4.2
(D) 2.1

Answer: (C) 4.2 · Official APSCHE final key

Q170 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If the degree of association is 70% for the reaction $2\mathrm{A} \rightleftharpoons (\mathrm{A})_2$, the van't Hoff factor for the solute 'A' is

(A) 0.30
(B) 0.70
(C) 0.35
(D) 0.65

Answer: (D) 0.65 · The council's preliminary key

Q171 TS EAMCET 2018 · 5 May · Shift 1 MCQ

How many grams of glucose must be added to 0.5 liter of a solution so that its osmotic pressure is same as that of a solution of 9.2 g of glucose dissolved in a liter?

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(A) 1.15
(B) 9.22
(C) 2.31
(D) 4.60

Answer: (D) 4.60 · The council's preliminary key

Q172 TS EAMCET 2018 · 5 May · Shift 2 MCQ

In an experiment to estimate the molecular weight of benzoic acid by elevation in boiling point method, the experimental value of molecular weight was double the actual value. Calculate the degree of association of dimer if the elevation in B.P. is $2\,^{\circ}\mathrm{C}$.

(A) 1.0
(B) 0.5
(C) 0.9
(D) 2.0

Answer: (A) 1.0 · The council's preliminary key

Q173 TS EAMCET 2018 · 5 May · Shift 2 MCQ

$2.0\ \mathrm{g}$ of a non-electrolyte dissolved in $100\ \mathrm{g}$ of benzene lowers the freezing point of benzene by $1.2\ \mathrm{K}$. The freezing point depression constant of benzene is $5.12\ \mathrm{K\,kg\,mol^{-1}}$. The molar mass of the solute is

(A) $55\ \mathrm{g\,mol^{-1}}$
(B) $85\ \mathrm{g\,mol^{-1}}$
(C) $120\ \mathrm{g\,mol^{-1}}$
(D) $155\ \mathrm{g\,mol^{-1}}$

Answer: (B) $85\ \mathrm{g\,mol^{-1}}$ · The council's preliminary key

Q174 TS EAMCET 2018 · 4 May · Shift 1 MCQ

At 300 K, a one litre solution of sucrose (molecular weight : 342) was prepared by dissolving 40 g of sucrose. What is the approximate osmotic pressure (in kPa) of solution at the same temperature? ($R = 8.314 \times 10^{6}\ \mathrm{cm^{3}\,Pa\,K^{-1}\,mol^{-1}}$)

(A) 292
(B) 500
(C) 292000
(D) 600

Answer: (A) 292 · The council's preliminary key

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Q175 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Calculate the approximate ΔT_b (in K) for 0.001 molal KCl solution if its van't Hoff factor is 1.98. [K_b of water is 0.52 K kg mol^{-1}]

(A) 1.03
(B) 1.03×10^{-3}
(C) 1.03×10^{-5}
(D) 1.03×10^{-1}

Answer: (B) 1.03×10^{-3} · The council's preliminary key

Q176 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Henry's law constant for CO_2 in water is 1.67 kbar at 25 °C. The quantity of CO_2 in 1000 mL of soda water when packed under 5 bar CO_2 pressure at 25 °C is

(A) 0.084 mol
(B) 0.167 mol
(C) 0.252 mol
(D) 0.336 mol

Answer: (B) 0.167 mol · The council's preliminary key

Q177 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If CO_2 gas having a partial pressure of 1.67 bar is bubbled through 1 L water at 298 K, the amount of CO_2 dissolved in water in $g\,L^{-1}$ is approximately
(Henry's law constant of CO_2 is 1.67 k bar at 298 K).

(A) 24.42
(B) 12.21
(C) 2.44
(D) 1.22

Answer: (C) 2.44 · The council's preliminary key

Q178 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

12.25 g of $CH_3CH_2CHClCOOH$ is added to 250 g of water to make a solution. If the dissociation constant of above acid is 1.44×10^{-3}, the depression in freezing point of water in °C is
(K_f for water is 1.86 K kg mol^{-1})

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(A) 0.789
(B) 0.394
(C) 1.183
(D) 0.592

Answer: (A) 0.789 · The council's preliminary key

Q179 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Match the following.
List - I
A) Azeotrope
B) Henry's law
C) Cryoscopic constant
D) Van't Hoff factor
List - II
I) $\Delta T_b = iK_b m$
II) $p = K_H x$
III) $\Delta T_f / m$
IV) Deviation from Raoult's law
V) $\pi = CRT$
The correct answer is

(A) A-II, B-III, C-V, D-IV
(B) A-IV, B-II, C-III, D-I
(C) A-IV, B-II, C-I, D-III
(D) A-I, B-III, C-II, D-IV

Answer: (B) A-IV, B-II, C-III, D-I · The council's preliminary key

Q180 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The mass of ascorbic acid ($C_6H_8O_6$) to be dissolved in 100 g of acetic acid to lower its freezing point by $1.5\ ^\circ C$ in g is :
(K_f for acetic acid is $4.0\ K\ kg\ mol^{-1}$)

(A) 17.6
(B) 8.8
(C) 6.6
(D) 13.2

Answer: (C) 6.6 · The council's preliminary key

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Q181 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

When 36 g of a non-volatile, non-electrolytic solute having the empirical formula CH_2O is dissolved in 1.2 kg of water, the solution freezes at $-0.93\ ^\circ C$. The molecular formula of the solute is (K_f of water = 1.86 K kg mol^{-1})

(A) CH_2O
(B) $C_2H_4O_2$
(C) $C_3H_6O_3$
(D) $C_4H_8O_4$

Answer: (B) $C_2H_4O_2$ · The council's preliminary key

Q182 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Benzene and toluene form an ideal solution over the entire range of composition. The vapour pressure of pure benzene and toluene at T (K) are 50 mm Hg and 40 mm Hg respectively. What is the mole fraction of toluene in vapour phase when 117 g of benzene is mixed with 46 g of toluene ? (molar mass of benzene and toluene are 78 and 92 g mol^{-1} respectively)

(A) 0.78
(B) 0.21
(C) 0.64
(D) 0.35

Answer: (B) 0.21 · The council's preliminary key

Q183 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

The quantity of CO_2 in 500 mL of soda water when packed under 3.34 bar CO_2 pressure at 298 K in g is (Henry's law constant for CO_2 in water at 298 K is 1.67×10^8 Pa).

(A) 2.442
(B) 1.221
(C) 4.884
(D) 3.663

Answer: (A) 2.442 · The council's preliminary key

Q184 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

300 mL of an aqueous solution of a protein contains 2.52 g of the protein. If osmotic pressure of such a solution at 300 K is 5.04×10^{-3} bar, the molar mass of the protein in g mol^{-1} is

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(A) 83.0×10^3
(B) 20.8×10^3
(C) 41.5×10^3
(D) 41.5×10^4

Answer: (C) 41.5×10^3 · The council's preliminary key

Q185 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

The measured osmotic pressure of a solution prepared by dissolving $17.4\ \text{mg}$ of K_2SO_4 in 2L of water at $27\ ^\circ\text{C}$ is 3.735×10^{-3} bar. The Van't Hoff factor is
($R = 0.083\ \text{L bar K}^{-1}\ \text{mol}^{-1}$; atomic weights K = 39 ; S = 32 ; O = 16)

(A) 2.84
(B) 3.0
(C) 2.0
(D) 2.32

Answer: (B) 3.0 · The council's preliminary key

Q186 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

At T(K), the vapour pressure of pure benzene is 0.85 bar. A non-volatile, non-electrolyte substance weighing 0.5 g when added to 39 g of benzene, the vapour pressure of the solution is 0.845 bar. The molar mass (in g mol^{-1}) of the substance is

(A) 180
(B) 270
(C) 160
(D) 169

Answer: (D) 169 · The council's preliminary key

Q187 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

0.1 m solution each of sodium sulphate, urea and sodium chloride are taken. The correct ratio of elevation of boiling point of these solutions is

(A) 1 : 1 : 1
(B) 3 : 1 : 2
(C) 1 : 2 : 3
(D) 2 : 3 : 1

Answer: (B) 3 : 1 : 2 · The council's preliminary key

Q188 TS EAMCET 2017 · 12 May · Offline MCQ

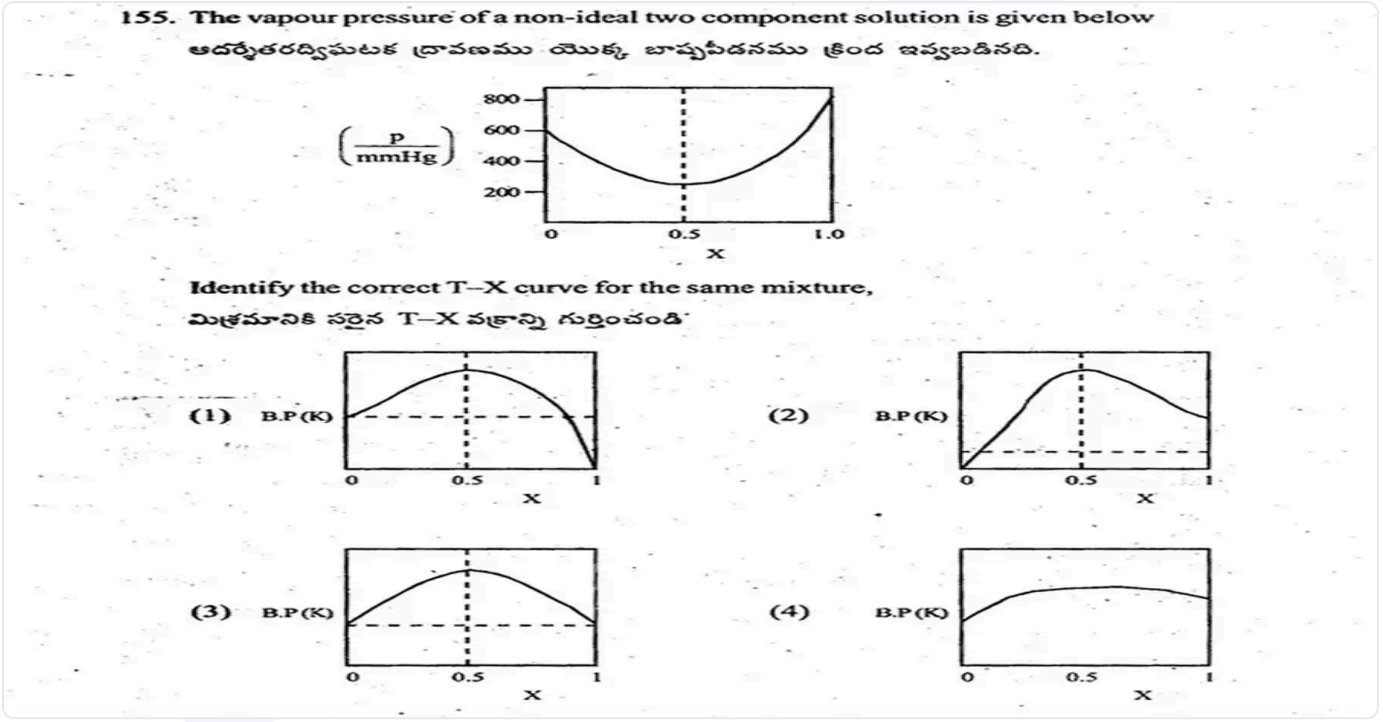
Which of the following conditions are correct for real solutions showing negative deviation from Raoult's law?

(A) $\Delta H_{\text{Mix}} < 0$; $\Delta V_{\text{Mix}} > 0$
(B) $\Delta H_{\text{Mix}} > 0$; $\Delta V_{\text{Mix}} > 0$
(C) $\Delta H_{\text{Mix}} > 0$; $\Delta V_{\text{Mix}} < 0$
(D) $\Delta H_{\text{Mix}} < 0$; $\Delta V_{\text{Mix}} < 0$

Answer: (D) $\Delta H_{\text{Mix}} < 0$; $\Delta V_{\text{Mix}} < 0$ · The council's preliminary key

Q189 TS EAMCET 2017 · 12 May · Offline MCQ

The vapour pressure of a non-ideal two component solution is given below *(see the figure above)*
Identify the correct T-X curve for the same mixture,



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (A) · The council's preliminary key

Q190 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

31 g of ethylene glycol ($C_2H_6O_2$) is dissolved in 600 g of water. The freezing point depression of the solution is (K_f for water is $1.86\ \text{K kg mol}^{-1}$)

(A) $3.10\ \mathrm{K}$
(B) $4.65\ \mathrm{K}$
(C) $0.77\ \mathrm{K}$
(D) $1.55\ \mathrm{K}$

Answer: (D) $1.55\ \mathrm{K}$ · The council's preliminary key

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Q191 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Which one of the following solutions of compounds show highest osmotic pressure? (AB, $\mathrm{AB_2}$ and $\mathrm{A_2B_3}$ are ionic compounds)

(A) 3.0 M AB type i = 1.6 and temperature is $27^{\circ}\mathrm{C}$
(B) 2.5 M $\mathrm{AB_2}$ type i = 2.5 and temperature is $57^{\circ}\mathrm{C}$
(C) 1.5 M $\mathrm{A_2B_3}$ type i = 4.1 and temperature is $27^{\circ}\mathrm{C}$
(D) 5.0 M urea i = 1.0 and temperature is $67^{\circ}\mathrm{C}$

Answer: (B) 2.5 M $\mathrm{AB_2}$ type i = 2.5 and temperature is $57^{\circ}\mathrm{C}$ · The council's preliminary key

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Q192 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

At T(K), the vapour pressures of two liquids, heptane and octane are 106 kPa and 47 kPa respectively. If 25g of heptane and 57g of octane form an ideal solution, at T(K) the vapour pressure of solution in kPa is :

(A) 66.66
(B) 76.5
(C) 50.0
(D) 60.0

Answer: (A) 66.66 · The council's preliminary key

Q193 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

At 27 °C, the osmotic pressure of a solution containing 4g of a non-electrolyte solute in 1.0 L of solution is 0.4 bar. The molar mass of the solute in $\mathrm{g\,mol^{-1}}$ is :
($R = 0.083\ \mathrm{L\,bar\,K^{-1}mol^{-1}}$)

(A) 24.6
(B) 49.2
(C) 249
(D) 180

Answer: (C) 249 · The council's preliminary key

Q194 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The ideal solutions formed by mixing two liquids A and B at 300 K in the molar ratio 1 : 1 and 1 : 2 have vapour pressures of 400 mm and 350 mm respectively. At the same temperature, the vapour pressures of pure liquids A and B in mm respectively are:

(A) 250, 550
(B) 500, 500
(C) 550, 250
(D) 350, 450

Answer: (C) 550, 250 · The council's preliminary key

Q195 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

0.8 mL of acetic acid of density 1.06 g mL^{-1} when dissolved in 1 kg of water causes depression in freezing point by 0.0325 °C. The Van't Hoff factor is: (K_f of $\mathrm{H_2O}$ = 1.86 K kg mol^{-1})

(A) 1.24
(B) 1.04
(C) 0.09
(D) 2.05

Answer: (A) 1.24 · The council's preliminary key

Q196 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

At T(K), the vapour pressure of pure benzene (molar mass $= 78\ \mathrm{g\ mol}^{-1}$) is 0.85 bar. When 2.0 g of non-volatile, non-electrolyte solute is added to 39 g of benzene, the vapour pressure of solution at T(K) is 0.83 bar. The elevation in boiling point (in K) of the same solution [is] ($\mathrm{K_b}$ of benzene is $2.6\ \mathrm{K\ kg\ mol}^{-1}$)

(A) 0.0784
(B) 0.196
(C) 1.568
(D) 0.784

Answer: (D) 0.784 · The council's preliminary key

Q197 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

At 27°C, two liquids A and B form an ideal solution with mole fractions 0.67 and 0.33 respectively. If the vapour pressure of pure A and B at 27°C are 300 mm and 450 mm respectively, the total vapour pressure of the solution in mm is:

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(A) 349.5
(B) 700
(C) 249.5
(D) 148.5

Answer: (A) 349.5 · The council's preliminary key

Q198 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

What is the molar mass (in $\mathrm{g\,mol^{-1}}$) of a substance, which forms a 7% by mass solution in water, which freezes at $-0.93^{\circ}\mathrm{C}$? (K_f of $\mathrm{H_2O} = 1.86\ \mathrm{K\,kg\,mol^{-1}}$)

(A) 140.4
(B) 150.5
(C) 160.6
(D) 155.5

Answer: (B) 150.5 · The council's preliminary key

Q199 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Assertion (A): The vapour pressure of 0.1M sugar solution is less than that of 0.1M KCl solution
Reason (R): Lowering of vapour pressure is directly proportional to the number of particles of non-volatile solute present in the solution
The correct answer is

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(B) Both (A) and (R) are correct and (R) is not the correct explanation of (A)
(C) (A) is correct but (R) is not correct
(D) (A) is not correct but (R) is correct

Answer: (D) (A) is not correct but (R) is correct · The council's preliminary key

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Q200 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

At 350 K, the vapour pressure of pure liquids A and B are 450 mm and 700 mm respectively. If the total vapour pressure of liquid mixture is 600 mm of Hg, the mole fractions of A and B in vapour phase respectively are :

(A) 0.4, 0.6
(B) 0.6, 0.4
(C) 0.3, 0.7
(D) 0.7, 0.3

Answer: (C) 0.3, 0.7 · The council's preliminary key

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Q201 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

At 298 K, Henry's law constant for CO_2 in water is 1.67×10^8 Pa. At 298 K, the quantity of CO_2 in 1000 mL of soda water when packed at 1.67×10^2 kPa CO_2 pressure in mol L^{-1} is : (water density = 1.0 g cm^{-3})

(A) 5.55×10^{-3}
(B) 0.555
(C) 5.55×10^{3}
(D) 5.55×10^{-2}

Answer: (D) 5.55×10^{-2} · The council's preliminary key

Q202 TS EAMCET 2016 · 15 May · Offline MCQ

The experimental depression in freezing point of a dilute solution is 0.025 K. If the van't Hoff factor (i) is 2.0, the calculated depression in freezing point (in K) is

(A) 0.00125
(B) 0.025
(C) 0.0125
(D) 0.05

Answer: (C) 0.0125 · Official TGCHE final key

Q203 TS EAMCET 2016 · 15 May · Offline MCQ

The molality of an aqueous dilute solution containing non-volatile solute is 0.1 m. What is the boiling temperature (in °C) of solution ? (Boiling point elevation constant, $K_b = 0.52 \text{ kg mol}^{-1} \text{ K}$; boiling temperature of water = 100°C).

(A) 100.0052
(B) 100.052
(C) 100.0
(D) 100.52

Answer: (B) 100.052 · Official TGCHE final key

Q204 AP EAMCET 2016 · 29 Apr · Offline MCQ

The vapour pressures of pure benzene and toluene are 160 and 60 mm Hg respectively. The mole fraction of benzene in vapour phase in contact with equimolar solution of benzene and toluene is

(A) 0.073
(B) 0.027
(C) 0.27
(D) 0.73

Answer: (D) 0.73 · The council's preliminary key

Q205 AP EAMCET 2016 · 29 Apr · Offline MCQ

6 g of a non volatile, non electrolyte X dissolved in 100 g of water freezes at $-0.93^{\circ}\mathrm{C}$. The molar mass of X in $\mathrm{g\,mol^{-1}}$ is (K_f of $\mathrm{H_2O}$ = 1.86 $\mathrm{K\,kg\,mol^{-1}}$)

(A) 60
(B) 140
(C) 180
(D) 120

Answer: (D) 120 · The council's preliminary key

Q206 AP EAMCET 2014 · 22 May · Offline MCQ

The molar mass of a solute X in g $\mathrm{mol^{-1}}$, if its 1% solution is isotonic with a 5% solution of cane sugar (molar mass = 342 g $\mathrm{mol^{-1}}$), is

(A) 68.4
(B) 34.2
(C) 136.2
(D) 171.2

Answer: (A) 68.4 · The council's preliminary key

Q207 AP EAMCET 2014 · 22 May · Offline MCQ

Vapour pressure in mm Hg of 0.1 mole of urea in 180 g of water at 25°C is
(The vapour pressure of water at 25°C is 24 mm Hg)

(A) 2.376
(B) 20.76
(C) 23.76
(D) 24.76

Answer: (C) 23.76 · The council's preliminary key

Q208 AP EAMCET 2013 · 10 May · Offline MCQ

Which one of the following is an isotonic pair of solutions ?

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(A) 0.15 M NaCl and 0.1 M Na_2SO_4
(B) 0.2 M Urea and 0.1 M Sugar
(C) 0.1 M $BaCl_2$ and 0.2 M Urea
(D) 0.2 M $MgSO_4$ and 0.1 M NH_4Cl

Answer: (A) 0.15 M NaCl and 0.1 M Na_2SO_4 · The council's preliminary key

Q209 AP EAMCET 2013 · 10 May · Offline MCQ

The vapour pressure in mm of Hg, of an aqueous solution obtained by adding 18 g of glucose ($C_6H_{12}O_6$) to 180 g of water at 100°C is :

(A) 7.60
(B) 76.0
(C) 759
(D) 752.4

Answer: (D) 752.4 · The council's preliminary key

Q210 AP EAMCET 2012 · 12 May · Offline MCQ

The weight in grams of a non-volatile solute (M. wt : 60) to be dissolved in 90 g of water to produce a relative lowering of vapour pressure of 0.02 is

(A) 4
(B) 8
(C) 6
(D) 10

Answer: (C) 6 · Official APSCHE final key

Q211 AP EAMCET 2012 · 12 May · Offline MCQ

The experimentally determined molar mass of a non-volatile solute, $BaCl_2$ in water by Cottrell's method, is

(A) equal to the calculated molar mass
(B) more than the calculated molar mass
(C) less than the calculated molar mass
(D) double of the calculated molar mass

Answer: (C) less than the calculated molar mass · Official APSCHE final key

Q212 AP EAMCET 2011 · 8 May · Offline MCQ

A solution of 10 g of a non-volatile binary electrolyte (mol. wt. = 100) in 500 g of water freezes at -0.74°C. What is the degree of ionisation ?
(k_f of water = 1.85 K molality^{-1})

(A) 50%
(B) 75%
(C) 100%
(D) 0%

Answer: (C) 100% · The council's preliminary key

Q213 AP EAMCET 2010 · 30 May · Offline MCQ

If $BaCl_2$ ionizes to an extent of 80% in aqueous solution, the value of Van't Hoff factor is :

(A) 2.6
(B) 0.4
(C) 0.8
(D) 2.4

Answer: (A) 2.6 · Official APSCHE final key

Q214 AP EAMCET 2010 · 30 May · Offline MCQ

X is a non-volatile solute and Y is a volatile solvent. The following vapour pressures are observed by dissolving X in Y :

X/mol lit^{-1}	Y/mm of Hg
0.10	P_1
0.25	P_2
0.01	P_3

The correct order of vapour pressures is :

(A) $P_1 < P_2 < P_3$
(B) $P_3 < P_2 < P_1$
(C) $P_3 < P_1 < P_2$
(D) $P_2 < P_1 < P_3$

Answer: (D) $P_2 < P_1 < P_3$ · Official APSCHE final key

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