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CHEMISTRY · JEE MAIN

Mole Concept & Stoichiometry

Previous Year Questions with answers

253 questions · **181** papers · **2002–2026** · newest paper first

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What is in this PDF: every Mole Concept & Stoichiometry question we hold from past JEE Main and AIEEE 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 JEE app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

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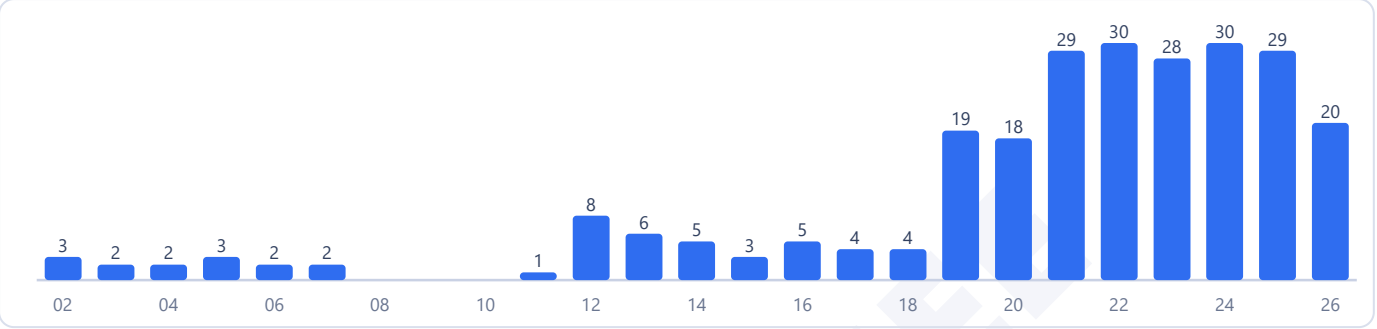
Chapter at a glance

4.4%	253	148 of 162	137 / 116
of Chemistry questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

Trend. Steady: 1.4 questions per paper in 2024–2026 against 1.2 in 2019–2023.

Questions per year



Counts are the questions we hold: 253 in 181 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2026)



How often it comes up

Mole concept and stoichiometry provides the quantitative foundation for chemical calculations under Unit 1: Some Basic Concepts in Chemistry in the Class 11 curriculum, holding rank 7 among 31 chemistry chapters with a 4.4 percent share of the entire chemistry section. In the computer-based testing era from 2019 to 2026, candidates faced 203 questions across 162 papers, representing an average rate of 1.3 questions per examination shift. The chapter featured in 148 of those 162 papers, and questions were set in every single year throughout the cycle. During the recent 2024 to 2026 period, testing recorded 79 questions across 58 papers, maintaining an average of 1.4 questions per shift and achieving a 5.1 percent subject share. The chapter's share is up compared to both the 3.7 percent share in the 2002 to 2018 window and the 4.4 percent baseline across 2019 to 2026. In 2026 alone, examiners presented 20 questions across 19 papers, showing up in 16 individual shifts. A remarkable 116 questions between 2019 and 2026 were formatted as numerical answer questions, meaning over half of all questions from this chapter demand exact arithmetic answers rather than multiple choice selection.

Most-asked topics

Questions in this chapter concentrate across five defined areas:

- **Stoichiometry**: 98 questions historically, with 82 asked between 2019 and 2026, tested up to 2026. This dominant area tests gravimetric calculations, limiting reagents, theoretical and percentage yields, eudiometry gas combustion analysis, and sequential multi-step chemical reactions.
- **Concentration Terms**: 85 total questions, including 70 from 2019 to 2026, tested in 2026. Problems assess molarity, molality, mole fraction, mass percentage, volume percentage, parts per million, mixing of solutions, and dilution calculations.

- **Mole & Molar Mass**: 35 lifetime problems, with 26 between 2019 and 2026, continuing in 2026. Concepts explore Avogadro's number conversions, molar volume of ideal gases at standard temperature and pressure, total atom counting across compounds, and average atomic masses.
- **Empirical & Molecular Formula**: 30 questions overall, with 22 from 2019 to 2026, tested through 2026. Themes evaluate percentage elemental compositions, simplest integer molar ratios, combustion analysis data, and determination of molecular formulas using molar masses.
- **Laws of Chemical Combination**: 5 questions since 2002, with 3 asked between 2019 and 2026, last tested in 2024. Questions examine Dalton's atomic theory postulates, law of conservation of mass, definite proportions, and multiple proportions.

What the questions look like

JEE Main problems in mole concept emphasize multi-step numerical problem solving and quantitative reasoning:

- **Hydrocarbon combustion eudiometry**: Gaseous hydrocarbons combusted with excess oxygen gas produce volume contractions before and after absorption by potassium hydroxide solutions, allowing deduction of the molecular formula.
- **Concentration conversion in acid mixtures**: Combining concentrated aqueous solutions of known mass percentages to evaluate the resulting mole fraction, molarity, or molality of the solute.
- **Limiting reagent and unreacted residue**: Two reactants mixed in non-stoichiometric proportions react to form a compound. Students determine which reactant is exhausted first, how much product forms, and what mass of excess reactant remains.
- **Titration neutralization stoichiometry**: Calculating the exact mass or volume of an acid neutralized by a standard alkaline titrant solution.

How to practise it

Always write balanced chemical equations before performing arithmetic. Convert all given reactant quantities into moles, divide by respective stoichiometric coefficients, and identify the smallest ratio to find the limiting reagent.

Build automatic fluency with concentration conversions. Practice converting directly between mass percentage, molarity, and molality using solution density. Remember that molality depends on kilograms of solvent, while molarity depends on liters of total solution.

With 116 numerical response questions appearing between 2019 and 2026, train yourself to compute without intermediate rounding errors. Keep track of decimal points and units when calculating masses in milligrams versus grams.

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Q1 JEE Main 2026 · 8 Apr · Shift 2 MCQ

Match **List - I** with **List - II**.

List - I Mass of substance	**List - II Number of atoms**
A. 1.8 mg water	I. $2 \times 10^{-4} \times N_A$
B. 9.8 mg sulphuric acid	II. $1.5 \times 10^{-4} \times N_A$
C. 1.8 mg carbon	III. $3 \times 10^{-4} \times N_A$
D. 5.85 mg salt (NaCl)	IV. $7 \times 10^{-4} \times N_A$

Choose the **correct** answer from the options given below :

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

Answer: (C) A-III, B-IV, C-II, D-I · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 MCQ

An oxide of iron contains 69.9% iron, its empirical formula, is:
(Given : Molar mass of Fe and O are 56 and 16 g mol^{-1} respectively.)

(A) FeO
(B) Fe_2O_3
(C) Fe_3O_4
(D) FeO_3

Answer: (B) Fe_2O_3 · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

Which of the following contain the same number of atoms ?
(Given : Molar mass in g mol^{-1} of H, He, O and S are 1, 4, 16 and 32 respectively)

A. 2 g of O_2 gas

B. 4 g of SO_2 gas

C. 1400 mL of O_2 at STP

D. 0.05 L of He at STP

E. 0.0625 mol of H_2 gas

Choose the **correct** answer from the options given below :

(A) A and B only
(B) B and C only
(C) C and D only
(D) A, C and E only

Answer: (D) A, C and E only · Official NTA final key

Q4 JEE Main 2026 · 5 Apr · Shift 1 MCQ

How many grams of residue is obtained by heating 2.76 g of silver carbonate?
(Given : Molar mass of C, O and Ag are 12, 16 and 108 g mol^{-1} respectively)

(A) 1.08 g
(B) 2.16 g
(C) 3.24 g
(D) 4.32 g

Answer: (B) 2.16 g · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 1 MCQ

What is the mole fraction of water in 10% by weight (w/w) of aqueous urea solution?

[Given: Molar mass of H, O, C and N are 1, 16, 12 and 14 g mol^{-1} respectively.]

(A) 0.825
(B) 0.032
(C) 0.867
(D) 0.967

Answer: (D) 0.967 · Official NTA final key

Q6 JEE Main 2026 · 5 Apr · Shift 2 MCQ

What volume of hydrogen gas at STP would be liberated by action of 50 mL of H_2SO_4 of 50% purity (density = 1.3 g mL^{-1}) on 20 g of zinc ?
Given : Molar mass of H, O, S, Zn are 1, 16, 32, 65 g mol^{-1} respectively.

(A) 5.824 L
(B) 7.428 L
(C) 6.892 L
(D) 8.375 L

Answer: (C) 6.892 L · Official NTA final key

Q7 JEE Main 2026 · 4 Apr · Shift 1 MCQ

Number of moles and number of molecules in 1.4187 L of SO_2 at STP respectively are

(A) $0.1266;\ 3.812 \times 10^{22}$
(B) $0.0633;\ 3.812 \times 10^{22}$
(C) $0.1266;\ 7.6238 \times 10^{22}$
(D) $0.0633;\ 7.6238 \times 10^{22}$

Answer: (B) $0.0633;\ 3.812 \times 10^{22}$ · Official NTA final key

Q8 JEE Main 2026 · 4 Apr · Shift 2 MCQ

The correct order of total number of atoms present in

(A) 2 moles of cyclohexane

(B) 684 g of sucrose

(C) 90.8 L of dihydrogen at STP

is:

(A) C > A > B
(B) C > B > A
(C) B > C > A
(D) B > A > C

Answer: (D) B > A > C · Official NTA final key

Q9 JEE Main 2026 · 2 Apr · Shift 1 MCQ

The mass of iron converted into Fe_3O_4 by the action of 18 g of steam is :
(Given : Molar mass of H, O and Fe are 1, 16 and 56 g mol^{-1} respectively)
Assume iron is present in excess :

(A) 2.1 g
(B) 4.2 g
(C) 21 g
(D) 42 g

Answer: (D) 42 g · Official NTA final key

Q10 JEE Main 2026 · 2 Apr · Shift 1 Numerical

One mole of an alkane (x) requires 8 mole oxygen for complete combustion. Sum of number of carbon and hydrogen atoms in the alkane (x) is _____.

Numerical value type: the answer is a number.

Answer: 17. · Official NTA final key

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Q11 JEE Main 2026 · 2 Apr · Shift 2 MCQ

The ratio of mass percentage (w/w) of C : H in a hydrocarbon is 12 : 1. It has two carbon atoms. The weight (in g) of $CO_2(g)$ formed when 3.38 g of this hydrocarbon is completely burnt in oxygen is : (Given : Molar mass in g mol^{-1} C : 12, H : 1, , O : 16)

(A) 5.68
(B) 11.44
(C) 22.74
(D) 17.05

Answer: (B) 11.44 · Official NTA final key

Q12 JEE Main 2026 · 28 Jan · Shift 2 MCQ

For the given reaction;

$$CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$$

If 90 g $CaCO_3$ is added to 300 mL of HCl which contains 38.55% HCl by mass and has density 1.13 g mL^{-1}, then which of the following option is **correct** ?

Given molar mass of H, Cl, Ca and O are 1, 35.5, 40 and 16 g mol^{-1} respectively.

(A) 60.32 g of HCl remains unreacted
(B) 32.85 g of $CaCO_3$ remains unreacted
(C) 97.30 g of HCl reacted
(D) 64.97 g of HCl remains unreacted

Answer: (D) 64.97 g of HCl remains unreacted · Official NTA final key

Q13 JEE Main 2026 · 24 Jan · Shift 2 MCQ

A student has planned to prepare acetanilide from aniline using acetic anhydride.

The student has started from 9.3 g of aniline. However, the student has managed to obtain 11 g of dry acetanilide.

The % yield of this reaction is :-

(A) 97.5%
(B) 81.5%
(C) 59.5%
(D) 72.5%

Answer: (B) 81.5% · Official NTA final key

Q14 JEE Main 2026 · 23 Jan · Shift 1 Numerical

x mg of pure HCl was used to make an aqueous solution. 25.0 mL of 0.1 M $Ba(OH)_2$ solution is used when the HCl solution was titrated against it. The numerical value of x is _____ $\times 10^{-1}$. (Nearest

integer)

Given : Molar mass of HCl and $Ba(OH)_2$ are 36.5 and 171.0 g mol^{-1} respectively.

Numerical value type: the answer is a number.

Answer: 1825. · Official NTA final key

Q15 JEE Main 2026 · 22 Jan · Shift 1 MCQ

In the reaction,

$2Al(s) + 6HCl(aq) \rightarrow 2\,Al^{3+}(aq) + 6\,Cl^{-}(aq) + 3H_2(g)$

(A) 11.2 L $H_2(g)$ at STP is produced for every mole of HCl consumed.

(B) 12 L HCl(aq) is consumed for every 6L $H_2(g)$ produced.

(C) 33.6 L $H_2(g)$ is produced regardless of temperature and pressure for every mole of Al that reacts.

(D) 67.2 L $H_2(g)$ at STP is produced for every mole of Al that reacts.

Answer: (A) 11.2 L $H_2(g)$ **at STP is produced for every mole of HCl consumed.** · Official NTA final key

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Q16 JEE Main 2026 · 22 Jan · Shift 2 MCQ

At T(K), 100 g of 98% H_2SO_4 (w/w) aqueous solution is mixed with 100 g of 49% H_2SO_4 (w/w) aqueous solution. What is the mole fraction of H_2SO_4 in the resultant solution ?

(Given : Atomic mass H = 1 u ; S = 32 u ; O = 16 u).

(Assume that temperature after mixing remains constant)

(A) 0.337

(B) 0.1

(C) 0.9

(D) 0.663

Answer: (A) 0.337 · Official NTA final key

Q17 JEE Main 2026 · 22 Jan · Shift 2 MCQ

$A + 2B \longrightarrow AB_2$

36.0 g of 'A' (Molar mass : 60 g mol^{-1}) and 56.0 g of 'B' (Molar mass : 80 g mol^{-1}) are allowed to react. Which of the following statements are **correct** ?

A. 'A' is the limiting reagent.

B. 77.0 g of AB_2 is formed.

C. Molar mass of AB_2 is 140 g mol^{-1}.

D. 15.0 g of A is left unreacted after the completion of reaction.

Choose the **correct** answer from the options given below :

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

Answer: (C) B and D Only · Official NTA final key

Q18 JEE Main 2026 · 21 Jan · Shift 1 MCQ

80 mL of a hydrocarbon on mixing with 264 mL of oxygen in a closed U-tube undergoes complete combustion. The residual gases after cooling to 273 K occupy 224 mL. When the system is treated with KOH solution, the volume decreases to 64 mL. The formula of the hydrocarbon is :

(A) C_2H_4
(B) C_2H_6
(C) C_2H_2
(D) C_4H_{10}

Answer: (C) C_2H_2 · Official NTA final key

Q19 JEE Main 2026 · 21 Jan · Shift 1 MCQ

14.0 g of calcium metal is allowed to react with excess HCl at 1.0 atm pressure and 273 K. Which of the following statements is **incorrect** ?
[Given : Molar mass in g mol^{-1} of Ca $-$ 40, Cl $-$ 35.5, H $-$ 1]

(A) 0.35 mol of H_2 gas is evolved.
(B) 7.84 L of H_2 gas is evolved.
(C) The limiting reagent is calcium metal.
(D) 33.3 g of $CaCl_2$ is produced.

Answer: (D) 33.3 g of $CaCl_2$ is produced. · Official NTA final key

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Q20 JEE Main 2026 · 21 Jan · Shift 2 MCQ

Aqueous HCl reacts with MnO_2(s) to form $MnCl_2$(aq), Cl_2(g) and H_2O(l). What is the weight (in g) of Cl_2 liberated when 8.7 g of MnO_2(s) is reacted with excess aqueous HCl solution ?
(Given Molar mass in g mol^{-1} Mn = 55, Cl = 35.5, O = 16, H = 1)

(A) 21.3
(B) 71
(C) 14.2
(D) 7.1

Answer: (D) 7.1 · Official NTA final key

Q21 JEE Main 2025 · 8 Apr · Shift 2 Numerical

20 mL of sodium iodide solution gave 4.74 g silver iodide when treated with excess of silver nitrate solution. The molarity of the sodium iodide solution is _____ M. (Nearest Integer value)

(Given : Na = 23, I = 127, Ag = 108, N = 14, O = 16 g mol^{-1})

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q22 JEE Main 2025 · 7 Apr · Shift 1 MCQ

At the sea level, the dry air mass percentage composition is given as nitrogen gas: 70.0, oxygen gas: 27.0 and argon gas: 3.0. If total pressure is 1.15 atm, then calculate the ratio of following respectively:

(i) partial pressure of nitrogen gas to partial pressure of oxygen gas

(ii) partial pressure of oxygen gas to partial pressure of argon gas

(Given: Molar mass of N, O and Ar are 14, 16 and $40 g\,mol^{-1}$ respectively.)

(A) 2.96, 11.2
(B) 2.59, 11.85
(C) 4.26, 19.3
(D) 5.46, 17.8

Answer: (A) 2.96, 11.2 · Key from source paper

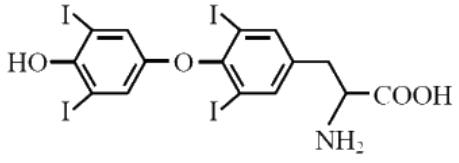
Q23 JEE Main 2025 · 7 Apr · Shift 1 Numerical

Thyroxine, the hormone has given below structure

(see the figure above)

The percentage of iodine in thyroxine is _____ %. (nearest integer) (Given molar mass in $g\,mol^{-1}$ C:12, H:1, O:16, N:14, I:127)

25. Thyroxine, the hormone has given below structure



The percentage of iodine in thyroxine is ____%. (nearest integer) (Given molar mass in $gmol^{-1}$ C : 12, H : 1, O : 16, N : 14, I : 127)

Numerical value type: the answer is a number.

Answer: 65. · Key from source paper

Q24 JEE Main 2025 · 7 Apr · Shift 2 Numerical

Butane reacts with oxygen to produce carbon dioxide and water following the equation given below.

$C_4H_{10}(g) + \frac{13}{2}O_2(g) \rightarrow 4CO_2(g) + 5H_2O(l)$

If 174.0 kg of butane is mixed with 320.0 kg of O_2, the volume of water formed in liters is _____ . (Nearest integer)

[Given : (a) Molar mass of C, H, O are $12, 1, 16 g\,mol^{-1}$ respectively, (b) Density of water $= 1 g\,mL^{-1}$]

Numerical value type: the answer is a number.

Answer: 138. · Key from source paper

Q25 JEE Main 2025 · 4 Apr · Shift 1 Numerical

Fortification of food with iron is done using $FeSO_4 \cdot 7H_2O$. The mass in grams of the $FeSO_4 \cdot 7H_2O$ required to achieve 12 ppm of iron in 150 kg of wheat is _____ (Nearest integer)

[Given: Molar mass of Fe, S and and O respectively are 56, 32 and $16 g\,mol^{-1}$]

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q26 JEE Main 2025 · 4 Apr · Shift 2 Numerical

The amount of calcium oxide produced on heating 150 kg limestone (75% pure) is _____ kg. (Nearest integer)

Given: Molar mass (in $gmol^{-1}$) of $Ca - 40, O - 16, C - 12$

Numerical value type: the answer is a number.

Answer: 63. · Key from source paper

Q27 JEE Main 2025 · 4 Apr · Shift 2 Numerical

Sea water, which can be considered as a 6 molar (6 M) solution of NaCl, has a density of $2 gmL^{-1}$. The concentration of dissolved oxygen (O_2) in sea water is 5.8 ppm. Then the concentration of dissolved oxygen (O_2) in sea water, is $x \times 10^{-4}$ m.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q28 JEE Main 2025 · 3 Apr · Shift 1 MCQ

Among 10^{-9} g (each) of the following elements, which one will have the highest number of atoms?

Element: Pb, Po, Pr and Pt

(A) Po
(B) Pt
(C) Pr
(D) Pb

Answer: (C) Pr · Key from source paper

Q29 JEE Main 2025 · 3 Apr · Shift 2 MCQ

10 mL of 2 M NaOH solution is added to 20 mL of 1 M HCl solution kept in a beaker. Now, 10 mL of this mixture is poured into a volumetric flask of 100 mL containing 2 moles of HCl and made the volume upto the mark with distilled water. The solution in this flask is :

(A) Neutral solution
(B) 10 M HCl solution
(C) 20 M HCl solution
(D) 0.2 M NaCl solution

Answer: (C) 20 M HCl solution · Key from source paper

Q30 JEE Main 2025 · 3 Apr · Shift 2 MCQ

Mass of magnesium required to produce 220 mL of hydrogen gas at STP on reaction with excess of dil. HCl is

Given: Molar mass of Mg is $24g\ mol^{-1}$.

(A) 2.444 g
(B) 0.24 mg
(C) 236 mg
(D) 235.7 g

Answer: (C) 236 mg · Key from source paper

Q31 JEE Main 2025 · 3 Apr · Shift 2 Numerical

X g of nitrobenzene on nitration gave 4.2 g of m -dinitrobenzene. X= _____ g. (nearest integer)

[Given: molar mass (in $gmol^{-1}$) C:12,H:1,O:16,N:14]

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q32 JEE Main 2025 · 2 Apr · Shift 1 MCQ

$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$

Consider the above reaction, what mass of $CaCl_2$ will be formed if 250 mL of 0.76 M HCl reacts with 1000 g of $CaCO_3$?

(Given : Molar mass of Ca, C, O, H and Cl are 40,12,16,1 and $35.5gmol^{-1}$, respectively)

(A) 10.545 g
(B) 3.908 g
(C) 5.272 g
(D) 2.636 g

Answer: (A) 10.545 g · Key from source paper

Q33 JEE Main 2025 · 2 Apr · Shift 1 MCQ

On complete combustion 1.0 g of an organic compound (X) gave 1.46 g of CO_2 and 0.567 g of H_2O. The empirical formula mass of compound (X) is _____

(Given molar mass in $gmol^{-1} C : 12, H : 1, O : 16$)

(A) 45
(B) 15
(C) 30
(D) 60

Answer: (C) 30 · Key from source paper

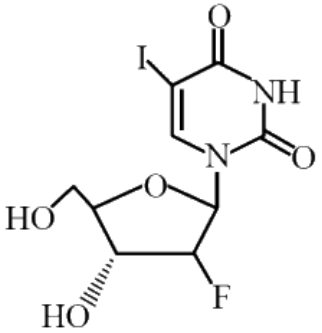
Q34 JEE Main 2025 · 2 Apr · Shift 1 Numerical

0.1 mol of the following given antiviral compound (P) will weigh _____ $\times 10^{-1} g$ (nearest integer).

(see the figure above)

(Given : molar mass in g mol^{-1} H: 1, C: 12, N: 14, O: 16, F: 19, I: 127)

23. 0.1 mol of the following given antiviral compound (P) will weigh _____ $\times 10^{-1} g$ (nearest integer).



(P)

(Given : molar mass in g mol^{-1} H: 1, C: 12, N: 14, O: 16, F: 19, I: 127)

Numerical value type: the answer is a number.

Answer: 372. · Key from source paper

Q35 JEE Main 2025 · 2 Apr · Shift 2 MCQ

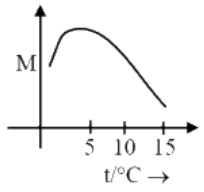
'x' g of NaCl is added to water in a beaker with a lid. The temperature of the system is raised from $1^{\circ}C$ to $25^{\circ}C$. Which out of the following plots, is best suited for the change in the molarity (M) of the

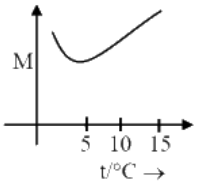
solution with respect to temperature?

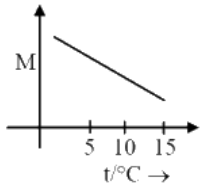
[Consider the solubility of NaCl remains unchanged over the temperature range]

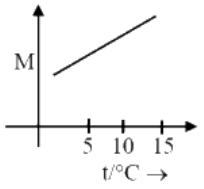
6. 'x' g of NaCl is added to water in a beaker with a lid. The temperature of the system is raised from $1^{\circ}C$ to $25^{\circ}C$. Which out of the following plots, is best suited for the change in the molarity (M) of the solution with respect to temperature?

[Consider the solubility of NaCl remains unchanged over the temperature range]

(1) 

(2) 

(3) 

(4) 

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

Answer: (A) · Key from source paper

Q36 JEE Main 2025 · 29 Jan · Shift 1 MCQ

Choose the correct statements. (A) Weight of a substance is the amount of matter present in it. (B) Mass is the force exerted by gravity on an object. (C) Volume is the amount of space occupied by a substance. (D) Temperatures below $0^{\circ}C$ are possible in Celsius scale, but in Kelvin scale negative temperature is not possible. (E) Precision refers to the closeness of various measurements for the same quantity. Choose the correct answer from the options given below :

(A) (A), (D) and (E) Only
(B) (C), (D) and (E) Only
(C) (A), (B) and (C) Only
(D) (B), (C) and (D) Only

Answer: (B) (C), (D) and (E) Only · Key from source paper

Q37 JEE Main 2025 · 29 Jan · Shift 2 Numerical

In the Claisen-Schmidt reaction to prepare, dibenzalacetone from 5.3 g of benzaldehyde, a total of 3.51 g of product was obtained. The percentage yield in this reaction was _____ %.

Numerical value type: the answer is a number.

Answer: 60. · Key from source paper

Q38 JEE Main 2025 · 28 Jan · Shift 1 Numerical

The molarity of a 70% (mass / mass) aqueous solution of a monobasic acid (X) is _____ $\times 10^{-1}$ M(Nearest integer) [Given: Density of aqueous solution of (X) is 1.25 g mL^{-1} Molar mass of the acid is

70 g mol^{-1}]

Numerical value type: the answer is a number.

Answer: 125. · Key from source paper

Q39 JEE Main 2025 · 28 Jan · Shift 1 Numerical

Quantitative analysis of an organic compound (X) shows following % composition. C : 14.5% Cl : 64.46% H: 1.8 % (Empirical formula mass of the compound (X) is _____ $\times 10^{-1}$ (Given molar mass in gmol^{-1} of C : 12, H : 1, O : 16, Cl : 35.5)

Numerical value type: the answer is a number.

Answer: 1655. · Key from source paper

Q40 JEE Main 2025 · 28 Jan · Shift 2 MCQ

Concentrated nitric acid is labelled as 75% by mass. The volume in mL of the solution which contains 30 g of nitric acid is _____ . Given : Density of nitric acid solution is 1.25 g/mL.

(A) 40
(B) 32
(C) 45
(D) 55

Answer: (B) 32 · Key from source paper

Q41 JEE Main 2025 · 24 Jan · Shift 1 Numerical

Xg of benzoic acid on reaction with aq $\mathrm{NaHCO_3}$ released $\mathrm{CO_2}$ that occupied 11.2 L volume at STP. X is _____ g.

Numerical value type: the answer is a number.

Answer: 61. · Key from source paper

Q42 JEE Main 2025 · 24 Jan · Shift 1 Numerical

Consider the following reaction occurring in the blast furnace: $\mathrm{Fe_3O_{4(s)}} + 4\mathrm{CO_{(g)}} \rightarrow 3\mathrm{Fe_{(l)}} + 4\mathrm{CO_{2(g)}}$ ' x ' kg of iron is produced when 2.32×10^3 $\mathrm{kgFe_3O_4}$ and 2.8×10^2 kgCO are brought together in the furnace. The value of ' x ' is _____ . (nearest integer) Given: molar mass of $\mathrm{Fe_3O_4}$ = 232 g mol^{-1} molar mass of CO = 28 g mol^{-1} molar mass of Fe = 56 g mol^{-1} }

Numerical value type: the answer is a number.

Answer: 420. · Key from source paper

Q43 JEE Main 2025 · 24 Jan · Shift 2 MCQ

The elemental composition of a compound is 54.2%C, 9.2%H and 36.6%O. If the molar mass of the compound is 132 g mol^{-1}, the molecular formula of the compound is : [Given : The relative atomic

mass of C : H : O = 12 : 1 : 16]

(A) $C_4H_9O_3$

(B) $C_6H_{12}O_6$

(C) $C_4H_8O_2$

(D) $C_6H_{12}O_3$

Answer: (D) $C_6H_{12}O_3$ · Key from source paper

Q44 JEE Main 2025 · 23 Jan · Shift 1 MCQ

2.8×10^{-3} mol of CO_2 is left after removing 10^{21} molecules from its ' x ' mg sample. The mass of CO_2 taken initially is Given: $N_A = 6.02 \times 10^{23}\ mol^{-1}$

(A) 98 .3 mg

(B) 48.2 mg

(C) 196 .2 mg

(D) 150 .4 mg

Answer: (C) 196 .2 mg · Key from source paper

Q45 JEE Main 2025 · 23 Jan · Shift 2 Numerical

0.01 mole of an organic compound (X) containing 10% hydrogen, on complete combustion produced 0.9 gH_2O. Molar mass of (X) is _____ $gmol^{-1}$.

Numerical value type: the answer is a number.

Answer: 100. · Key from source paper

Q46 JEE Main 2025 · 23 Jan · Shift 2 Numerical

When 81.0 g of aluminium is allowed to react with 128.0 g of oxygen gas, the mass of aluminium oxide produced in grams is _____ - (Nearest integer) Given : Molar mass of Al is 27.0 g mol^{-1} Molar mass of O is 16.0 g mol^{-1}

Numerical value type: the answer is a number.

Answer: 153. · Key from source paper

Q47 JEE Main 2025 · 22 Jan · Shift 1 Numerical

Some CO_2 gas was kept in a sealed container at a pressure of 1 atm and at 273 K . This entire amount of CO_2 gas was later passed through an aqueous solution of $Ca(OH)_2$. The excess unreacted $Ca(OH)_2$ was later neutralized with 0.1 M of 40 mL HCl . If the volume of the sealed container of CO_2 was x, then x is _____ cm^3 (nearest integer). [Given : The entire amount of CO_2(g) reacted with exactly half of the initial amount of $Ca(OH)_2$ present in the aqueous solution.]

Numerical value type: the answer is a number.

Answer: 45. · Key from source paper

Q48 JEE Main 2025 · 22 Jan · Shift 2 MCQ

Density of 3 M NaCl solution is 1.25 g/mL. The molality of the solution is :

(A) 1.79 m
(B) 2.79 m
(C) 2 m
(D) 3 m

Answer: (B) 2.79 m · Key from source paper

Q49 JEE Main 2025 · 22 Jan · Shift 2 Numerical

20 mL of 2 M NaOH solution is added to 400 mL of 0.5 M NaOH solution. The final concentration of the solution is _____ $\times 10^{-2}$M. (Nearest integer)

Numerical value type: the answer is a number.

Answer: 57. · Key from source paper

Q50 JEE Main 2024 · 9 Apr · Shift 1 Numerical

Molarity (M) of an aqueous solution containing x g of anhyd. $CuSO_4$ in 500 mL solution at 32°C is 2×10^{-1}M. Its molality will be _____ $\times 10^{-3}$ m. (nearest integer). [Given density of the solution = 1.25 g/mL]

Numerical value type: the answer is a number.

Answer: 164. · Key from source paper

Q51 JEE Main 2024 · 9 Apr · Shift 2 MCQ

The candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency ' A ' $\times 10^{12}$ hertz and that has a radiant intensity in that direction of \frac{1}{'\B\'} watt per steradian. 'A' and 'B' are respectively

(A) 540 and 683
(B) 450 and 683
(C) 450 and $\frac{1}{683}$
(D) 540 and $\frac{1}{683}$

Answer: (A) 540 and 683 · Key from source paper

Q52 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Combustion of glucose $(C_6H_{12}O_6)$ produces CO_2 and water. The amount of oxygen (in g) required for the complete combustion of 900 g of glucose is : [Molar mass of glucose in $gmol^{-1}$ = 180]

(A) 480
(B) 800
(C) 960
(D) 32

Answer: (C) 960 · Key from source paper

Q53 JEE Main 2024 · 8 Apr · Shift 2 Numerical

A solution is prepared by adding 1 mole ethyl alcohol in 9 mole water. The mass percent of solute in the solution is _____ (Integer answer) (Given : Molar mass in gmol^{-1} Ethyl alcohol : 46 water: 18)

Numerical value type: the answer is a number.

Answer: 22. · Key from source paper

Q54 JEE Main 2024 · 8 Apr · Shift 2 Numerical

Molality of an aqueous solution of urea is 4.44 m. Mole fraction of urea in solution is $x \times 10^{-3}$. Value of x is - (Integer answer)

Numerical value type: the answer is a number.

Answer: 74. · Key from source paper

Q55 JEE Main 2024 · 6 Apr · Shift 1 MCQ

The density of ' x ' M solution (' X ' molar) of NaOH is 1.12 g mL^{-1}, while in molality, the concentration of the solution is 3 m(3molal). Then x is (Given : Molar mass of NaOH is 40 g/mol)

(A) 3.5
(B) 3.8
(C) 2.8
(D) 3.0

Answer: (D) 3.0 · Key from source paper

Q56 JEE Main 2024 · 6 Apr · Shift 2 MCQ

Molality (m) of 3M aqueous solution of NaCl is : (Given : Density of solution = 1.25 g mL^{-1}, Molar mass in gmol^{-1} : Na $-$ 23, Cl $-$ 35.5)

(A) 1.9 m
(B) 3.85 m
(C) 2.79 m
(D) 2.90 m

Answer: (C) 2.79 m · Key from source paper

EdLoop JEE

Q57 JEE Main 2024 · 5 Apr · Shift 1 MCQ

An organic compound has 42.1% carbon, 6.4% hydrogen and remainder is oxygen. If its molecular weight is 342, then its molecular formula is :

(A) $C_{11}H_{18}O_{12}$
(B) $C_{12}H_{20}O_{12}$
(C) $C_{12}H_{22}O_{11}$
(D) $C_{14}H_{20}O_{10}$

Answer: (C) $C_{12}H_{22}O_{11}$ · Key from source paper

Q58 JEE Main 2024 · 5 Apr · Shift 1 MCQ

The incorrect postulates of the Dalton's atomic theory are : (A) Atoms of different elements differ in mass. (B) Matter consists of divisible atoms. (C) Compounds are formed when atoms of different element combine in a fixed ratio. (D) All the atoms of given element have different properties including mass. (E) Chemical reactions involve reorganisation of atoms. Choose the correct answer from the options given below :

(A) (C), (D), (E) only
(B) (B), (D) only
(C) (A), (B), (D) only
(D) (B), (D), (E) only

Answer: (B) (B), (D) only · Key from source paper

Q59 JEE Main 2024 · 5 Apr · Shift 1 Numerical

9.3 g of pure aniline is treated with bromine water at room temperature to give a white precipitate of the product ' P '. The mass of product ' P ' obtained is 26.4 g. The percentage yield is _____ %.

Numerical value type: the answer is a number.

Answer: 80. · Key from source paper

Q60 JEE Main 2024 · 5 Apr · Shift 2 MCQ

The number of moles of methane required to produce 11 gCO_2(g) after complete combustion is : (Given molar mass of methane in $gmol^{-1}$: 16)

(A) 0.35
(B) 0.5
(C) 0.75
(D) 0.25

Answer: (D) 0.25 · Key from source paper

Q61 JEE Main 2024 · 5 Apr · Shift 2 Numerical

In the Claisen-Schmidt reaction to prepare 351 g of dibenzalacetone using 87 g of acetone, the amount of benzaldehyde required is _____ g. (Nearest integer)

Numerical value type: the answer is a number.

Answer: 318. · Key from source paper

Q62 JEE Main 2024 · 4 Apr · Shift 1 MCQ

The Molarity (M) of an aqueous solution containing 5.85 g of NaCl in 500 mL water is : (Given : Molar Mass Na : 23 and Cl : 35.5gmol^{-1})

(A) 2
(B) 20
(C) 4
(D) 0.2

Answer: (D) 0.2 · Key from source paper

Q63 JEE Main 2024 · 4 Apr · Shift 2 MCQ

Choose the Incorrect Statement about Dalton's Atomic Theory

(A) chemical reactions involve reorganization of atoms
(B) Matter consists of indivisible atoms.
(C) Compounds are formed when atoms of different elements combine in any ratio.
(D) Compounds are formed when atoms of different elements combine in any ratio. All the atoms of a given element have identical properties including identical mass.

Answer: (C) Compounds are formed when atoms of different elements combine in any ratio. · Key from source paper

Q64 JEE Main 2024 · 4 Apr · Shift 2 Numerical

From 6.55 g of aniline, the maximum amount of acetanilide that can be prepared will be _____ $\times 10^{-1}$ g.

Numerical value type: the answer is a number.

Answer: 95. · Key from source paper

Q65 JEE Main 2024 · 1 Feb · Shift 1 Numerical

Consider the following reaction:

$$3PbCl_2 + 2(NH_4)_3PO_4 \rightarrow Pb_3(PO_4)_2 + 6NH_4Cl$$

If 72 mmol $PbCl_2$ is mixed with 50 mmol of $(NH_4)_3PO_4$, then amount of $Pb_3(PO_4)_2$ formed in mmol. (nearest integer)

Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q66 JEE Main 2024 · 1 Feb · Shift 2 Numerical

10 mL of gaseous hydrocarbon on combustion gives 40 mL of CO_2g and 50 mL of water vapour. Total number of carbon and hydrogen atoms in the hydrocarbon is _____.

Numerical value type: the answer is a number.

Answer: 14. · Key from source paper

Q67 JEE Main 2024 · 31 Jan · Shift 1 Numerical

Number of moles of methane required to produce 22 g $CO_{2(g)}$ after combustion is $x \times 10^{-2}$ moles. The value of x is

Numerical value type: the answer is a number.

Answer: 50. · Key from source paper

Q68 JEE Main 2024 · 31 Jan · Shift 2 MCQ

A sample of $CaCO_3$ and $MgCO_3$ weighed 2.21 g is ignited to constant weight of 1.152 g. The composition of the mixture is:
(Given molar mass in g mol^{-1}, $CaCO_3$: 100, $MgCO_3$: 84)

(A) 1.187 g $CaCO_3$ + 1.023 g $MgCO_3$
(B) 1.023 g $CaCO_3$ + 1.023 g $MgCO_3$
(C) 1.187 g $CaCO_3$ + 1.187 g $MgCO_3$
(D) 1.023 g $CaCO_3$ + 1.187 g $MgCO_3$

Answer: (A) 1.187 g $CaCO_3$ + 1.023 g $MgCO_3$ · Key from source paper

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Q69 JEE Main 2024 · 31 Jan · Shift 2 Numerical

The molarity of 1L orthophosphoric acid H_3PO_4 having 70% purity by weight (specific gravity 1.54 g cm^{-3}) is _____ M. (Molar mass of H_3PO_4 = 98 g mol^{-1})

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q70 JEE Main 2024 · 30 Jan · Shift 1 Numerical

1. 05 cm thick coating of silver is deposited on a plate of 0. 05 m^2 area. The number of silver atoms deposited on plate are _____ $\times 10^{23}$. (At mass Ag = 108, d = 7. 9 g cm^{-3}) Round off to the nearest integer.

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q71 JEE Main 2024 · 30 Jan · Shift 1 Numerical

The mass of sodium acetate ($\mathrm{CH_3COONa}$) required to prepare 250 mL of 0. 35M aqueous solution is _____ g. (Molar mass of $\mathrm{CH_3COONa}$ is 82. 02 g $\mathrm{mol^{-1}}$) Round off to the nearest integer.

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q72 JEE Main 2024 · 30 Jan · Shift 2 MCQ

If a substance 'A' dissolves in solution of a mixture of 'B' and 'C' with their respective number of moles as n_A, n_B and n_C, mole fraction of C in the solution is:

(A) $\frac{n_C}{n_A \times n_B \times n_C}$

(B) $\frac{n_C}{n_A + n_B + n_C}$

(C) $\frac{n_C}{n_A - n_B - n_C}$

(D) $\frac{n_B}{n_A + n_B}$

Answer: (B) $\frac{n_C}{n_A + n_B + n_C}$ · Key from source paper

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Q73 JEE Main 2024 · 29 Jan · Shift 1 Numerical

A solution of $\mathrm{H_2SO_4}$ is 31.4% $\mathrm{H_2SO_4}$ by mass and has a density of 1.25 g/ mL. The molarity of the $\mathrm{H_2SO_4}$ solution is M (nearest integer) [Given molar mass of $\mathrm{H_2SO_4}$ = 98 g $\mathrm{mol^{-1}}$]

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q74 JEE Main 2024 · 29 Jan · Shift 2 Numerical

If 50 mL of 0.5M oxalic acid is required to neutralise 25 mL of NaOH solution, the amount of NaOH in 50 mL of given NaOH solution is _____ g.

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q75 JEE Main 2024 · 29 Jan · Shift 2 Numerical

Molality of 0.8M $\mathrm{H_2SO_4}$ solution (density 1.06 g $\mathrm{cm^{-3}}$) is _____ $\times 10^{-3}$ m.

Round off your answer to the nearest integer.

Numerical value type: the answer is a number.

Answer: 815. · Key from source paper

Q76 JEE Main 2024 · 27 Jan · Shift 1 Numerical

Mass of methane required to produce 22 g of CO after complete combustion is g. (Given Molar mass in g mol^{-1}, C = 12.0, H = 1.0, O = 16.0)

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q77 JEE Main 2024 · 27 Jan · Shift 2 MCQ

The quantity which changes with temperature is:

(A) Molarity
(B) Mass percentage
(C) Molality
(D) Mole fraction

Answer: (A) Molarity · Key from source paper

Q78 JEE Main 2024 · 27 Jan · Shift 2 Numerical

Volume of 3M NaOH (formula weight 40 g mol^{-1}) which can be prepared from 84 g of NaOH is _____ $\times 10^{-1}\,dm^3$.

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q79 JEE Main 2024 · 27 Jan · Shift 2 Numerical

9.3 g of aniline is subjected to reaction with excess acetic anhydride to prepare acetanilide. The mass of acetanilide produced if the reaction is 100% completed is _____ $\times 10^{-1}$ g.

(Given molar mass in g mol^{-1} N = 14, O = 16, C = 12, H = 1)

Numerical value type: the answer is a number.

Answer: 135. · Key from source paper

Q80 JEE Main 2023 · 13 Apr · Shift 1 Numerical

20 mL of calcium hydroxide was consumed when it was reacted with 10 mL of unknown solution of H_2SO_4. Also 20 mL standard solution of 0.5 M HCl containing 2 drops of phenolphthalein was titrated with calcium hydroxide, the mixture showed pink colour when burette displayed the value of 35.5 mL whereas the burette showed 25.5 mL initially. The concentration of H_2SO_4 is _____ M. (Nearest integer)

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q81 JEE Main 2023 · 13 Apr · Shift 2 Numerical

1 g of a carbonate M_2CO_3 on treatment with excess HCl produces 0.01 mol of CO_2. The molar mass of M_2CO_3 is g mol^{-1}. (Nearest integer)

Numerical value type: the answer is a number.

Answer: 100. · Key from source paper

Q82 JEE Main 2023 · 12 Apr · Shift 1 MCQ

A metal chloride contains 55.0% of chlorine by weight. 100 mL vapours of the metal chloride at STP weigh 0.57 g. The molecular formula of the metal chloride is
(Given: Atomic mass of chlorine is 35.5 u)

(A) MCl_4
(B) MCl_3
(C) MCl_2
(D) MCl

Answer: (C) MCl_2 · Key from source paper

Q83 JEE Main 2023 · 11 Apr · Shift 1 Numerical

A solution of sugar is obtained by mixing 200 g of its 25% solution and 500 g of its 40 % solution (both by mass). The mass percentage of the resulting sugar solution is _____ (Nearest integer)

Numerical value type: the answer is a number.

Answer: 36. · Key from source paper

Q84 JEE Main 2023 · 11 Apr · Shift 2 MCQ

A solution is prepared by adding 2 g of "X" to 1 mole of water. Mass percent of "X" in solution is

(A) 5%
(B) 20%
(C) 2%
(D) 10%

Answer: (D) 10% · Key from source paper

Q85 JEE Main 2023 · 11 Apr · Shift 2 Numerical

The volume of hydrogen liberated at STP by treating 2.4 g of magnesium with excess of hydrochloric acid is _____ $\times 10^{-2}$ L. Given Molar volume of gas is 22.4 L at STP. Molar mass of magnesium is 24 g mol^{-1}

Numerical value type: the answer is a number.

Answer: 224. · Key from source paper

Q86 JEE Main 2023 · 10 Apr · Shift 1 MCQ

The number of molecules and moles in 2.8375 litres of O_2 at STP are respectively

(A) 7.527×10^{23} and 0.125 mol
(B) 7.527×10^{22} and 0.250 mol
(C) 1.505×10^{23} and 0.250 mol
(D) 7.527×10^{22} and 0.125 mol

Answer: (D) 7.527×10^{22} **and** 0.125 **mol** · Key from source paper

Q87 JEE Main 2023 · 10 Apr · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: $3.1500\ g$ of hydrated oxalic acid dissolved in water to make $250.0\ mL$ solution will result in $0.1\ M$ oxalic acid solution.
Reason R: Molar mass of hydrated oxalic acid is $126\ g\ mol^{-1}$.
In the light of the above statements, choose the correct answer from the options given below:

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

Answer: (C) Both A and R are true and R is the correct explanation of A · Key from source paper

Q88 JEE Main 2023 · 10 Apr · Shift 2 MCQ

Match List-I with List-II
List-I List-II
A 16 g of CH_4 (g) I Weighs 28g
B 1 g of H_2 (g) II 60.2×10^{23} electrons
C 1 mole of N_2 (g) III Weighs 32g
D 0.5 mol of SO_2 (g) IV Occupies11.4 L volume at STP
Choose the correct answer from the options given below:

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

Answer: (B) A-II, B-IV, C-I, D-III · Key from source paper

Q89 JEE Main 2023 · 8 Apr · Shift 2 MCQ

Which of the following have same number of significant figures?

(A) 0.00253

(B) 1.0003

(C) 15.0

(D)163

Choose the correct answer from the options given below

(A) A, B and C only

(B) C and D only

(C) B and C only

(D) A, C and D only

Answer: (D) A, C and D only · Key from source paper

Q90 JEE Main 2023 · 6 Apr · Shift 1 Numerical

If 5 moles of $BaCl_2$ is mixed with 2 moles of Na_3PO_4, the maximum number of moles of $Ba_3(PO_4)_2$ formed is _____ (Nearest integer)

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q91 JEE Main 2023 · 6 Apr · Shift 2 MCQ

The volume of $0.02\ M$ aqueous HBr required to neutralize $10.0\ mL$ of $0.01\ M$ aqueous $Ba(OH)_2$ is (Assume complete neutralization)

(A) $2.5\ mL$

(B) $5.0\ mL$

(C) $10.0\ mL$

(D) $7.5\ mL$

Answer: (C) $10.0\ mL$ · Key from source paper

Q92 JEE Main 2023 · 1 Feb · Shift 1 Numerical

The density of 3M solution of NaCl is 1.0 $g\ mL^{-1}$. Molality of the solution is _____ $\times 10^{-2}$ m (Nearest integer).
Given: Molar mass of Na and Cl is 23 and 35.5 $g\ mol^{-1}$ respectively.

Numerical value type: the answer is a number.

Answer: 364. · Key from source paper

Q93 JEE Main 2023 · 1 Feb · Shift 2 Numerical

The molality of a 10%(v/V) solution of di-bromine solution in CCl_4 (carbon tetrachloride) is x '. x = _____ $\times 10^{-2}$M. (Nearest integer)
[Given : molar mass of Br_2 = 160 $g\ mol^{-1}$
atomic mass of C = 12 $g\ mol^{-1}$

atomic mass of Cl = 35.5 $\mathrm{g\ mol^{-1}}$
density of dibromine = 3.2 $\mathrm{g\ cm^{-3}}$
density of $\mathrm{CCl_4}$ = 1.6 $\mathrm{g\ cm^{-3}}$]

Numerical value type: the answer is a number.

Answer: 139. · Key from source paper

Q94 JEE Main 2023 · 31 Jan · Shift 1 Numerical

Zinc reacts with hydrochloric acid to give hydrogen and zinc chloride. The volume of hydrogen gas produced at STP from the reaction of 11.5 g of zinc with excess HCl is _____ L (Nearest integer)
(Given : Molar mass of Zn is 65.4 $\mathrm{g\ mol^{-1}}$ and Molar volume of $\mathrm{H_2}$ at STP = 22.7 L)

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q95 JEE Main 2023 · 31 Jan · Shift 2 MCQ

When a hydrocarbon A undergoes complete combustion it requires 11 equivalents of oxygen and produces 4 equivalents of water. What is the molecular formula of A?

(A) $\mathrm{C_{11}H_8}$
(B) $\mathrm{C_{11}H_4}$
(C) $\mathrm{C_5H_8}$
(D) $\mathrm{C_9H_8}$

Answer: (D) $\mathrm{C_9H_8}$ · Key from source paper

Q96 JEE Main 2023 · 31 Jan · Shift 2 Numerical

Assume carbon burns according to following equation :
$\mathrm{2C(s) + O_2(g) \rightarrow 2\,CO\ (g)}$
when 12 g carbon is burnt in 48 g of oxygen, the volume of carbon monoxide produced is _____ $\times 10^{-1}$ L at STP [nearest integer]
[Given : Assume CO as ideal gas, Mass of C is 12 g mol^{-1}, mass of O is 16 g mol^{-1} and molar volume of an idal gas at STP is 22.7 L mol^{-1}]

Numerical value type: the answer is a number.

Answer: 227. · Key from source paper

Q97 JEE Main 2023 · 30 Jan · Shift 1 Numerical

A 300 mL bottle of soft drink has 0.2 M $\mathrm{CO_2}$ dissolved in it. Assuming $\mathrm{CO_2}$ behaves as an ideal gas, the volume of the dissolved $\mathrm{CO_2}$ at STP is _____ mL. (Nearest integer)
Given: At STP, molar volume of an ideal gas is 22.7 L mol^{-1}

Numerical value type: the answer is a number.

Answer: 1362. · Key from source paper

Q98 JEE Main 2023 · 30 Jan · Shift 1 Numerical

Some amount of dichloromethane CH_2Cl_2 is added to 671.141 mL of chloroform $CHCl_3$ to prepare 2.6×10^{-3} M solution of CH_2Cl_2 DCM. The concentration of DCM is _____ ppm (by mass).
Given: Atomic mass : C = 12; H: 1; Cl = 35.5 density of $CHCl_3$ = 1.49 g cm^{-3}

Numerical value type: the answer is a number.

Answer: 148. · Key from source paper

Q99 JEE Main 2023 · 29 Jan · Shift 2 Numerical

The volume of HCl, containing 73g L^{-1}, required to completely neutralise NaOH obtained by reacting 0.69 g of metallic sodium with water, is _____ mL. (Nearest Integer)
(Given : molar Masses of Na, Cl, O, H are 23, 35.5, 16 and 1g mol^{-1} respectively)

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q100 JEE Main 2023 · 29 Jan · Shift 2 MCQ

When a hydrocarbon A undergoes combustion in the presence of air, it requires 9.5 equivalents of oxygen and produces 3 equivalents of water. What is the molecular formula of A?

(A) C_8H_6
(B) C_9H_9
(C) C_6H_6
(D) C_9H_6

Answer: (A) C_8H_6 · Key from source paper

Q101 JEE Main 2023 · 29 Jan · Shift 2 Numerical

When 0.01 mol of an organic compound containing 60% carbon was burnt completely, 4.4 g of CO_2 was produced. The molar mass of compound is _____ $g\,mol^{-1}$ (Nearest integer)

Numerical value type: the answer is a number.

Answer: 200. · Key from source paper

Q102 JEE Main 2023 · 25 Jan · Shift 1 Numerical

The density of a monobasic strong acid (Molar mass 24.2 $g\,mol^{-1}$) is 1.21 $kg\,L^{-1}$. The volume of its solution required for the complete neutralization of 25 mL of 0.24 M NaOH is 10^{-2} mL (Nearest integer)

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q103 JEE Main 2023 · 25 Jan · Shift 2 Numerical

Number of hydrogen atoms per molecule of a hydrocarbon A having 85.8% carbon is (Given : Molar mass of A = 84 g mol^{-1})

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q104 JEE Main 2023 · 25 Jan · Shift 2 MCQ

What is the mass ratio of ethylene glycol ($C_2H_6O_2$, molar mass = 62 g/ mol) required for making 500 g of 0.25 molal aqueous solution and 250 mL of 0.25 molar aqueous solution?

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

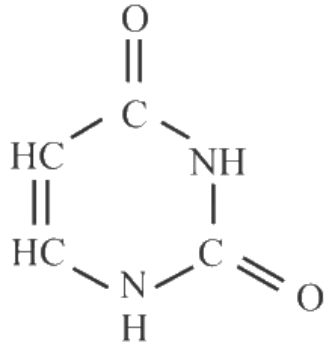
Answer: (C) 2 : 1 · Key from source paper

Q105 JEE Main 2023 · 24 Jan · Shift 1 Numerical

Uracil is base present in RNA with the following structure. % of N in uracil is _____.

(see the figure above)

Q54. Uracil is base present in RNA with the following structure. % of N in uracil is _____.



Uracil (U)

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q106 JEE Main 2023 · 24 Jan · Shift 1 Numerical

5 g of NaOH was dissolved in deionized water to prepare a 450 mL stock solution. What volume (in mL) of this solution would be required to prepare 500 mL of 0.1 M solution ? Given : Molar Mass of Na, O and H is 23, 16 and 1 g mol^{-1} respectively

Numerical value type: the answer is a number.

Answer: 180. · Key from source paper

Q107 JEE Main 2023 · 24 Jan · Shift 2 Numerical

The number of units, which are used to express concentration of solutions from the following is _____.

(Mass percent, Mole, Mole fraction, Molarity, ppm, Molality.)

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q108 JEE Main 2022 · 29 Jul · Shift 1 MCQ

$\mathrm{N_{2(g)}} + 3\mathrm{H_{2(g)}} \rightleftharpoons 2\mathrm{NH_{3(g)}}$ 20 g 5 g

Consider the above reaction. If 20g of dinitrogen reacts with 5g of dihydrogen, then the limiting reagent of the reaction and number of moles of $\mathrm{NH_3}$ formed respectively are

(A) $\mathrm{H_2}$, 1.42 moles
(B) $\mathrm{H_2}$, 0.71 moles
(C) $\mathrm{N_2}$, 1.42 moles
(D) $\mathrm{N_2}$, 0.71 moles

Answer: (C) $\mathrm{N_2}$, 1.42 moles · Key from source paper

Q109 JEE Main 2022 · 29 Jul · Shift 1 Numerical

In bromination of Propyne, with Bromine 1, 1, 2, 2-tetrabromopropane is obtained in 27% yield. The amount of 1, 1, 2, 2 tetrabromopropane obtained from 1 g of Bromine in this reaction is _____ $\times 10^{-1}$ g . (Molar Mass : Bromine = 80 g/ mol)

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q110 JEE Main 2022 · 29 Jul · Shift 2 MCQ

Consider the reaction

$4\mathrm{HNO_3(l)} + 3\mathrm{KCl(s)} \rightarrow \mathrm{Cl_2(g)} + \mathrm{NOCl(g)} + 2\mathrm{H_2O(g)} + 3\mathrm{KNO_3(s)}$

The amount of $\mathrm{HNO_3}$ required to produce 110.0 g of $\mathrm{KNO_3}$ is

(Given : Atomic masses of H, O, N and K are 1, 16, 14 and 39, respectively.)

(A) 32.2 g
(B) 69.4 g
(C) 91.5 g
(D) 162.5 g

Answer: (C) 91.5 g · Key from source paper

Q111 JEE Main 2022 · 29 Jul · Shift 2 Numerical

A 1.84 mg sample of polyhydric alcoholic compound 'X' of molar mass 92.0 g / mol gave 1.344 mL of H_2 gas at STP. The number of alcoholic hydrogen present in compound 'X' is

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q112 JEE Main 2022 · 28 Jul · Shift 1 Numerical

In the given reaction,
$X + Y + 3Z \rightleftarrows XYZ_3$
if one mole of each of X and Y with $0.05\ mol$ of Z gives compound XYZ_3. (Given : Atomic masses of X, Y and Z are 10,20 and 30amu, respectively). The yield of XYZ_3 is _____ g.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q113 JEE Main 2022 · 28 Jul · Shift 2 Numerical

$2\ L$ of $0.2\ M\ H_2SO_4$ is reacted with $2\ L$ of $0.1\ M\ NaOH$ solution, the molarity of the resulting product Na_2SO_4 in the solution is _____ millimolar.

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q114 JEE Main 2022 · 27 Jul · Shift 1 MCQ

250 g solution of D-glucose in water contains 10.8% of carbon by weight. The molality of the solution is nearest to (Given: Atomic Weights are H = 1u; C = 12 u; O = 16 u)

(A) 1.03
(B) 2.06
(C) 3.09
(D) 5.40

Answer: (B) 2.06 · Key from source paper

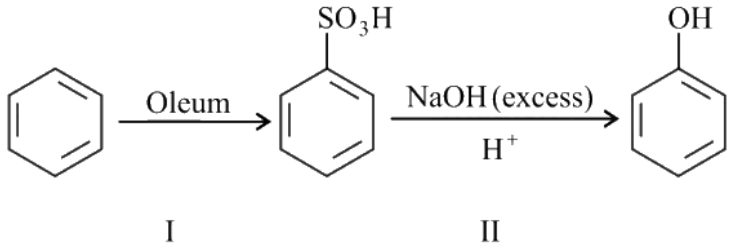
Q115 JEE Main 2022 · 27 Jul · Shift 1 Numerical

In the following reaction

(see the figure above)

The % yield for reaction I is 60% and that of reaction II is 50%. The overall yield of the complete reaction is%

Q56. In the following reaction



The % yield for reaction I is 60% and that of reaction II is 50%. The overall yield of the complete reaction is%

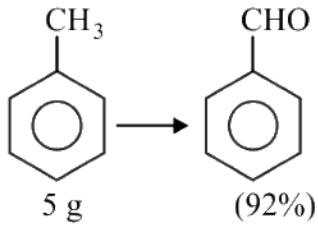
Numerical value type: the answer is a number.

Answer: 30. · Key from source paper

Q116 JEE Main 2022 · 27 Jul · Shift 2 Numerical

see figure

Q51.



In the above reaction, 5 g of toluene is converted into benzaldehyde with 92% yield. The amount of benzaldehyde produced is____ $\times 10^{-2}$ g

Numerical value type: the answer is a number.

Answer: 530. · Key from source paper

Q117 JEE Main 2022 · 27 Jul · Shift 2 Numerical

The normality of H_2SO_4 in the solution obtained on mixing 100 mL of 0.1M H_2SO_4 with 50 mL of 0.1M NaOH is _____ $\times 10^{-1}$ N.

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q118 JEE Main 2022 · 26 Jul · Shift 1 Numerical

Chlorophyll extracted from the crushed green leaves was dissolved in water to make 2 L solution of Mg of concentration 48ppm. The number of atoms of Mg in this solution is x $\times$ 10^{20} atoms. The value

of x is
(Nearest Integer) (Given : Atomic mass of Mg is 24 g mol^{-1}, $\mathrm{N_A}$ = 6.02×10^{23} mol^{-1})

Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q119 JEE Main 2022 · 26 Jul · Shift 1 Numerical

When 800 mL of 0.5M nitric acid is heated in a beaker, its volume is reduced to half and 11.5 g of nitric acid is evaporated. The molarity of the remaining nitric acid solution is x $\times 10^{-2}$M. (Molar mass of nitric acid is 63 g mol^{-1})

Numerical value type: the answer is a number.

Answer: 54. · Key from source paper

Q120 JEE Main 2022 · 26 Jul · Shift 2 MCQ

Hemoglobin contains 0.34% of iron by mass. The number of Fe atoms in 3.3 g of hemoglobin is (Given : Atomic mass of Fe is 56u, $\mathrm{N_A}$ in6.022×10^{23} mol^{-1})

(A) 1.21×10^{5}
(B) 12.0×10^{16}
(C) 1.21×10^{20}
(D) 3.4×10^{22}

Answer: (C) 1.21×10^{20} · Key from source paper

Q121 JEE Main 2022 · 25 Jul · Shift 1 MCQ

$\mathrm{SO_2Cl_2}$ on reaction with excess of water results into acidic mixture $\mathrm{SO_2Cl_2 + 2H_2O \rightarrow H_2SO_4 + 2HCl}$ 16 moles of NaOH is required for the complete neutralisation of the resultant acidic mixture. The number of moles of $\mathrm{SO_2Cl_2}$ used is

(A) 16
(B) 8
(C) 4
(D) 2

Answer: (C) 4 · Key from source paper

Q122 JEE Main 2022 · 25 Jul · Shift 2 Numerical

56.0 L of nitrogen gas is mixed with excess of hydrogen gas and it is found that 20 L of ammonia gas is produced, The volume of unused nitrogen gas is found to be _____ L.

Numerical value type: the answer is a number.

Answer: 46. · Key from source paper

EdLoop JEE

Q123 JEE Main 2022 · 29 Jun · Shift 1 MCQ

Production of iron in blast furnace follows the following equation
$Fe_3O_4(s) + 4CO(g) \rightarrow 3Fe(l) + 4CO_2(g)$
when 4.640 kg of Fe_3O_4 and 2.520 kg of CO are allowed to react then the amount of iror (in g) produced is :
[Given: Molar Atomic mass $(gmol^{-1})$: Fe $= 56$
Molar Atomic mass $(gmolm^{-1})$: O $= 16$
Molar Atomic mass $(gmolm^{-1})$: C $= 12$]

(A) 1400
(B) 2200
(C) 3360
(D) 4200

Answer: (C) 3360 · Key from source paper

Q124 JEE Main 2022 · 29 Jun · Shift 2 MCQ

Using the rules for significant figures, the correct answer for the expression $\frac{0.02858 \times 0.112}{0.5702}$ will be:

(A) 0.005613
(B) 0.00561
(C) 0.0056
(D) 0.006

Answer: (B) 0.00561 · Key from source paper

Q125 JEE Main 2022 · 28 Jun · Shift 2 MCQ

Compound A contains 8.7% Hydrogen, 74% Carbon and 17.3% Nitrogen. The molecular formula of the compound is, Given : Atomic masses of C, H and N are 12, 1 and 14 amu respectively.
The molar mass of the compound A is 162 g mol^{-1}.

(A) $C_4H_6N_2$
(B) C_2H_3N
(C) C_5H_7N
(D) $C_{10}H_{14}N_2$

Answer: (D) $C_{10}H_{14}N_2$ · Key from source paper

Q126 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion and the other is labelled as Reason.
Assertion: At $10\ ^\circ C$, the density of a 5 M solution of KCl [atomic masses of K & Cl are 39 & 35.5 g mol^{-1} respectively], is 'x' gml^{-1}. The solution is cooled to $-21\ ^\circ C$. The molality of the solution will remain unchanged.

Reason: The molality of a solution does not change with temperature as mass remains unaffected with temperature.
In the light of the above statements, choose the correct answer from the options given below.

(A) Assertion is true but Reason is false.
(B) Assertion is false but Reason is true.
(C) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(D) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

Answer: (C) Both Assertion and Reason are true and Reason is the correct explanation of Assertion. · Key from source paper

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Q127 JEE Main 2022 · 27 Jun · Shift 1 · Numerical

Two elements A and B which form 0.15 moles of A_2B and AB_3 type compounds. If both A_2B and AB_3 weigh equally, then the atomic weight of A is _____ times of atomic weight of B.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q128 JEE Main 2022 · 27 Jun · Shift 2 · Numerical

116 g of a substance upon dissociation reaction, yields 7.5 g of hydrogen, 60 g of oxygen and 48.5 g of carbon. Given that the atomic masses of H, O and C are $1, 16$ and 12, respectively. The data agrees with how many formulae of the following?
A. $CH_3\ COOH$
B. $HCHO$
C. $CH_3\ OOCH_3$
D. $CH_3\ CHO$

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q129 JEE Main 2022 · 26 Jun · Shift 1 · MCQ

A commercially sold conc. HCl is 35% HCl by mass. If the density of this commercial acid is 1.46 g/ mL, the molarity of this solution is : (Atomic mass : Cl = 35.5 amu, H = 1 amu)

(A) 10.2 M
(B) 14.0 M
(C) 12.5 M
(D) 18.2 M

Answer: (B) 14.0 M · Key from source paper

Q130 JEE Main 2022 · 26 Jun · Shift 2 Numerical

CNG is an important transportation fuel. When $100\ \mathrm{g}$ CNG is mixed with $208\ \mathrm{g}$ oxygen in vehicles, it leads to the formation of $\mathrm{CO_2}$ and $\mathrm{H_2O}$ and produces large quantity of heat during this combustion, then the amount of carbon dioxide, produced in grams is [nearest integer] [Assume CNG to be methane]

Numerical value type: the answer is a number.

Answer: 143. · Key from source paper

Q131 JEE Main 2022 · 26 Jun · Shift 2 Numerical

The moles of methane required to produce $81\ \mathrm{g}$ of water after complete combustion is _____ $\times 10^{-2}$ mol. [nearest integer]

Numerical value type: the answer is a number.

Answer: 225. · Key from source paper

Q132 JEE Main 2022 · 25 Jun · Shift 1 Numerical

The number of N atoms in $681\ \mathrm{g}$ of $\mathrm{C_7H_5N_3O_6}$ is $x \times 10^{21}$. The value of x is $\mathrm{N_A} = 6.02 \times 10^{23}\ \mathrm{mol^{-1}}$ (Nearest Integer)

Numerical value type: the answer is a number.

Answer: 5418. · Key from source paper

Q133 JEE Main 2022 · 25 Jun · Shift 1 Numerical

$1\ \mathrm{L}$ aqueous solution of $\mathrm{H_2SO_4}$ contains $0.02\ \mathrm{m\ mol}$ $\mathrm{H_2SO_4}$. 50% of this solution is diluted with deionized water to give $1\ \mathrm{L}$ solution A. In solution A, $0.01\ \mathrm{m\ mol}$ of $\mathrm{H_2SO_4}$ are added. Total m mols of $\mathrm{H_2SO_4}$ in the final solution is _____ $\times 10^{-3}$ m moles.

Numerical value type: the answer is a number.

Answer: 20. · Key from source paper

Q134 JEE Main 2022 · 25 Jun · Shift 1 Numerical

Number of grams of bromine that will completely react with $5.0\ \mathrm{g}$ of pent-1-ene is _____ $\times 10^{-2}$ g. (Atomic mass of Br = $80\ \mathrm{g/mol}$) [Nearest integer]

Numerical value type: the answer is a number.

Answer: 1143. · Key from source paper

Q135 JEE Main 2022 · 25 Jun · Shift 2 Numerical

A protein 'A' contains 0.30% of glycine (molecular weight 75). The minimum molar mass of the protein 'A' is _____ $\times 10^{3}\ \mathrm{g\ mol^{-1}}$ [nearest integer]

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q136 JEE Main 2022 · 25 Jun · Shift 2 Numerical

The neutralization occurs when $10\ \mathrm{mL}$ of $0.1\ \mathrm{M}$ acid 'A' is allowed to react with $30\ \mathrm{mL}$ of $0.05\ \mathrm{M}$ base $\mathrm{MOH_2}$. The basicity of the acid 'A' is
[M is a metal]

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q137 JEE Main 2022 · 24 Jun · Shift 1 MCQ

If a rocket runs on a fuel $(\mathrm{C_{15}H_{30}})$ and liquid oxygen, the weight of oxygen required and $\mathrm{CO_2}$ released for every litre of fuel respectively are :
(Given : density of the fuel is $0.756\ \mathrm{g/mL}$)

(A) $1188\ \mathrm{g}$ and $1296\ \mathrm{g}$
(B) $2376\ \mathrm{g}$ and $2592\ \mathrm{g}$
(C) $2592\ \mathrm{g}$ and $2376\ \mathrm{g}$
(D) $3429\ \mathrm{g}$ and $3142\ \mathrm{g}$

Answer: (C) $2592\ \mathrm{g}$ **and** $2376\ \mathrm{g}$ · Key from source paper

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Q138 JEE Main 2021 · 1 Sep · Shift 2 Numerical

The number of atoms in 8 g of sodium is $x \times 10^{23}$. The value of x is _____. (Nearest integer)
Given : $\mathrm{N_A} = 6.02 \times 10^{23}\ \mathrm{mol^{-1}}$ Atomic mass of Na = 23.0u]

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q139 JEE Main 2021 · 1 Sep · Shift 2 Numerical

If 80 g of copper sulphate $\mathrm{CuSO_4 \cdot 5H_2O}$ is dissolved in deionised water to make 5 L of solution. The concentration of the copper sulphate solution is $x \times 10^{-3}$ mol $\mathrm{L^{-1}}$. The value of x is _____.
[Atomic masses Cu : 63.54u, S : 32u, O : 16u, H : 1u]

Numerical value type: the answer is a number.

Answer: 64. · Key from source paper

Q140 JEE Main 2021 · 31 Aug · Shift 1 Numerical

The molarity of the solution prepared by dissolving 6.3 g of oxalic acid $(\mathrm{H_2C_2O_4 \cdot 2H_2O})$ in 250 mL of water in mol $\mathrm{L^{-1}}$ is x $\times 10^{-2}$. The value of x is _____. (Nearest integer)
[Atomic mass : H : 1.0, C : 12.0, O : 16.0 J]

Numerical value type: the answer is a number.

Answer: 20. · Key from source paper

Q141 JEE Main 2021 · 31 Aug · Shift 2 Numerical

Sodium oxide reacts with water to produce sodium hydroxide. 20.0 g of sodium oxide is dissolved in 500 mL of water. Neglecting the change in volume, the concentration of the resulting NaOH solution is _____ $\times 10^{-1}$M. (Nearest integer)
[Atomic mass : Na = 23.0, O = 16.0, H = 1.0]

Numerical value type: the answer is a number.

Answer: 13. · Key from source paper

Q142 JEE Main 2021 · 27 Aug · Shift 2 Numerical

100 g of propane is completely reacted with 1000 g of oxygen. The mole fraction of carbon dioxide in the resulting mixture is $x \times 10^{-2}$. The value of x is (Nearest integer)

Numerical value type: the answer is a number.

Answer: 19. · Key from source paper

Q143 JEE Main 2021 · 26 Aug · Shift 1 Numerical

An aqueous KCl solution of density $1.20\ \mathrm{g\ mL^{-1}}$ has a molality of $3.30\ \mathrm{mol\ kg^{-1}}$. The molarity of the solution in $\mathrm{molL^{-1}}$ is____.(The Nearest integer)
[Molar mass of $\mathrm{KCl} = 74.5$ g]

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q144 JEE Main 2021 · 26 Aug · Shift 2 Numerical

$100\ \mathrm{mL}$ of $\mathrm{Na_3PO_4}$ solution contains 3.45 g of sodium. The molarity of the solution is ..... $\times 10^{-2}\ \mathrm{mol\ L^{-1}}$. (Nearest integer)
[Atomic Masses - Na : 23.0u, O : 16.0u, P : 31.0u]

Numerical value type: the answer is a number.

Answer: 50. · Key from source paper

Q145 JEE Main 2021 · 27 Jul · Shift 2 Numerical

$2\,\mathrm{SO_2(g)} + \mathrm{O_2(g)} \rightarrow 2\,\mathrm{SO_3(g)}$
The above reaction is carried out in a vessel starting with partial pressure $\mathrm{P_{SO_2}} = 250\ \mathrm{m\ bar}$, $\mathrm{P_{O_2}} = 750\ \mathrm{m\ bar}$ and $\mathrm{P_{SO_3}} = 0\ \mathrm{bar}$. When the reaction is complete, the total pressure in the reaction vessel is _____ $\mathrm{m\ bar}$.
(Round off of the nearest integer).

Numerical value type: the answer is a number.

Answer: 875. · Key from source paper

Q146 JEE Main 2021 · 25 Jul · Shift 1 Numerical

Consider the complete combustion of butane, the amount of butane utilized to produce $72.0\ \mathrm{g}$ of water is _____ $\times 10^{-1}$ g. (in nearest integer)

Numerical value type: the answer is a number.

Answer: 464. · Key from source paper

Q147 JEE Main 2021 · 25 Jul · Shift 2 Numerical

The number of significant figures in 0.00340 is _____

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q148 JEE Main 2021 · 22 Jul · Shift 1 Numerical

Methylation of $10\ \mathrm{g}$ of benzene gave $9.2\ \mathrm{g}$ of toluene. Calculate the percentage yield of toluene (Nearest integer)

Numerical value type: the answer is a number.

Answer: 78. · Key from source paper

Q149 JEE Main 2021 · 22 Jul · Shift 1 Numerical

If the concentration of glucose ($\mathrm{C_6H_{12}O_6}$) in blood is $0.72\ \mathrm{gL^{-1}}$, the molarity of glucose in blood is _____ $\times 10^{-3}\mathrm{M}$ (Nearest integer):
[Given : Atomic mass of $\mathrm{C} = 12$, $\mathrm{H} = 1$, $\mathrm{O} = 16\ \mathrm{u}$]

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q150 JEE Main 2021 · 20 Jul · Shift 1 Numerical

$250\ \mathrm{mL}$ of $0.5\mathrm{M}$ NaOH was added to $500\ \mathrm{mL}$ of $1\mathrm{M}$ HCl. The number of unreacted HCl molecules in the solution after the complete reaction is $\mathrm{p} \times 10^{21}$. Find out p
(Nearest integer) ($\mathrm{N_A} = 6.022 \times 10^{23}$)

Numerical value type: the answer is a number.

Answer: 226. · Key from source paper

Q151 JEE Main 2021 · 20 Jul · Shift 2 Numerical

4 g equimolar mixture of NaOH and $\mathrm{Na_2\,CO_3}$ contains xg of NaOH and yg of $\mathrm{Na_2\,CO_3}$. The value of x is g.

(Nearest integer)

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q152 JEE Main 2021 · 18 Mar · Shift 1 Numerical

_____ grams of $3-$Hydroxy propanal (MW = 74) must be dehydrated to produce 7.8 g of acrolein (MW = 56)(C_3H_4O) if the percentage yield is 64. (Round off to the Nearest Integer).
[Given: Atomic masses : C : 12.0u, H : 1.0u, O : 16.0u]

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q153 JEE Main 2021 · 18 Mar · Shift 1 Numerical

Complete combustion of 3 g of ethane gives $x \times 10^{22}$ molecules of water. The value of x is _____ (Round off to the Nearest Integer).
[Use : $N_A = 6.023 \times 10^{23}$; Atomic masses in u : C: 12.0; O: 16.0; H: 1.0]

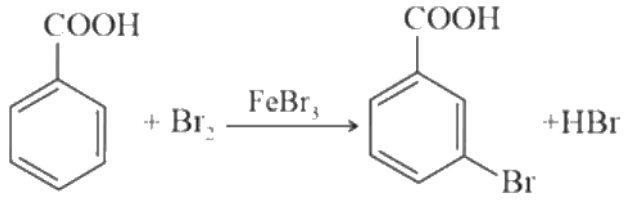
Numerical value type: the answer is a number.

Answer: 18. · Key from source paper

Q154 JEE Main 2021 · 18 Mar · Shift 2 Numerical

see figure

Q51.



Consider the above reaction where 6.1 g of benzoic acid is used to get 7.8 g of m-bromo benzoic acid. The percentage yield of the product is ___ .
(Round off to the Nearest integer)
[Given : Atomic masses : $C = 12.0$ u, $H : 1.0$ u, $O : 16.0$ u, $Br = 80.0$ u]

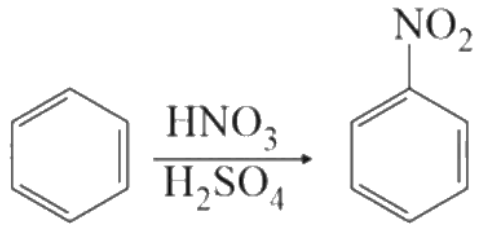
Numerical value type: the answer is a number.

Answer: 78. · Key from source paper

Q155 JEE Main 2021 · 17 Mar · Shift 1 Numerical

see figure

Q51.



In the above reaction, 3.9 g of benzene on nitration gives 4.92 g of nitrobenzene. The percentage yield of nitrobenzene in the above reaction is _____ %. (Round off to the Nearest Integer).
(Given atomic mass : C : 12.0 u, H : 1.0 u O : 16.0 u, N : 14.0 u)

Numerical value type: the answer is a number.

Answer: 80. · Key from source paper

Q156 JEE Main 2021 · 17 Mar · Shift 1 Numerical

The mole fraction of a solute in a 100 molal aqueous solution _____ $\times 10^{-2}$. (Round off to the Nearest Integer).
[Given : Atomic masses: H : 1.0 u, O : 16.0 u]

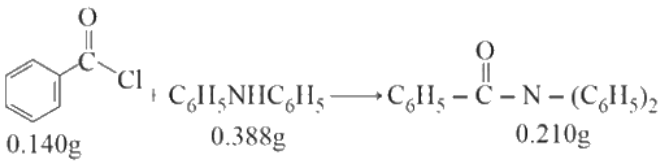
Numerical value type: the answer is a number.

Answer: 64. · Key from source paper

Q157 JEE Main 2021 · 17 Mar · Shift 2 Numerical

see figure

Q51.



Consider the above reaction. The percentage yield of amide product is (Round off to the Nearest Integer).
(Given : Atomic mass : C : 12.0u, H : 1.0u N : 14.0u, O : 16.0u, Cl : 35.5u)

Numerical value type: the answer is a number.

Answer: 77. · Key from source paper

Q158 JEE Main 2021 · 17 Mar · Shift 2 Numerical

The number of chlorine atoms in 20 mL of chlorine gas at STP is _____ 10^{21}. (Round off to the Nearest Integer). [Assume chlorine is an ideal gas at STP $R = 0.083$ L bar mol^{-1} K^{-1}, $N_A = 6.023 \times 10^{23}$]

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q159 JEE Main 2021 · 16 Mar · Shift 1 Numerical

A 6.50 molal solution of $\mathrm{KOH(aq.)}$ has a density of $1.89\ \mathrm{g\ cm^{-3}}$. The molarity of the solution is mol $\mathrm{dm^{-3}}$. (Round off to the Nearest Integer).
[Atomic masses: $\mathrm{K}: 39.0\mathrm{u}; \mathrm{O}: 16.0\mathrm{u}; \mathrm{H}: 1.0\mathrm{u}$]

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q160 JEE Main 2021 · 16 Mar · Shift 2 Numerical

When $35\ \mathrm{mL}$ of $0.15\ \mathrm{M}$ lead nitrate solution is mixed with $20\ \mathrm{mL}$ of $0.12\ \mathrm{M}$ chromic sulphate solution, _____ $\times 10^{-5}$ moles of lead sulphate precipitate out. (Round off to the Nearest Integer).

Numerical value type: the answer is a number.

Answer: 525. · Key from source paper

Q161 JEE Main 2021 · 26 Feb · Shift 1 Numerical

The number of significant figures in 50000.020×10^{-3} is _____

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q162 JEE Main 2021 · 26 Feb · Shift 2 Numerical

The $\mathrm{NaNO_3}$ weighed out to make $50\ \mathrm{mL}$ of an aqueous solution containing $70.0\ \mathrm{mg\ Na^+}$ per mL is _____ g. (Rounded off to the nearest integer) [Given : Atomic weight in $\mathrm{g\,mol^{-1}}$ – Na : 23; N : 14; O : 16]

Numerical value type: the answer is a number.

Answer: 13. · Key from source paper

Q163 JEE Main 2021 · 25 Feb · Shift 2 Numerical

Consider titration of NaOH solution versus 1.25 M oxalic acid solution. At the end point following burette readings were obtained.
(i) $4.5\ \mathrm{mL}$
(ii) $4.5\ \mathrm{mL}$
(iii) $4.4\ \mathrm{mL}$
(iv) $4.4\ \mathrm{mL}$
(v) $4.4\ \mathrm{mL}$
If the volume of oxalic acid taken was $10.0\ \mathrm{mL}$ then the molarity of the NaOH solution is _____ M. (Rounded-off to the nearest integer)

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q164 JEE Main 2021 · 24 Feb · Shift 1 Numerical

$4.5\ \mathrm{g}$ of compound A M.W. = 90 was used to make $250\ \mathrm{mL}$ of its aqueous solution. The molarity of the solution in M is $\mathrm{x} \times 10^{-1}$. The value of x is _____ (Rounded off to the nearest integer)

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q165 JEE Main 2021 · 24 Feb · Shift 2 Numerical

The formula of a gaseous hydrocarbon which requires 6 times of its own volume of $\mathrm{O_2}$ for complete oxidation and produces 4 times its own volume of $\mathrm{CO_2}$ is $\mathrm{C_xH_y}$. The value of y is _____.

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q166 JEE Main 2021 · 24 Feb · Shift 2 Numerical

$1.86\ \mathrm{g}$ of aniline completely reacts to form acetanilide. 10% of the product is lost during purification. Amount of acetanilide obtained after purification (in g) is _____ $\times 10^{-2}$.

Numerical value type: the answer is a number.

Answer: 243. · Key from source paper

Q167 JEE Main 2020 · 6 Sep · Shift 1 MCQ

A solution of two components containing $\mathrm{n_1}$ moles of the 1st component and $\mathrm{n_2}$ moles of the 2nd component is prepared. $\mathrm{M_1}$ and $\mathrm{M_2}$ are the molecular weights of component 1 and 2 respectively. If d is the density of the solution in $\mathrm{gmI^{-1}}$, $\mathrm{C_2}$ is the molarity and $\mathrm{x_2}$ is the mole fraction of the 2nd component, then $\mathrm{C_2}$ can be expressed as :

(A) $\mathrm{C_2} = \frac{1000x_2}{\mathrm{M_1}+x_2(\mathrm{M_2}-\mathrm{M_1})}$

(B) $\mathrm{C_2} = \frac{\mathrm{d}x_2}{\mathrm{M_1}+x_2(\mathrm{M_2}-\mathrm{M_1})}$

(C) $\mathrm{C_2} = \frac{1000\ \mathrm{d}x_2}{\mathrm{M_1}+x_2(\mathrm{M_2}-\mathrm{M_1})}$

(D) $\mathrm{C_2} = \frac{\mathrm{d}x_1}{\mathrm{M_2}+x_2(\mathrm{M_2}-\mathrm{M_1})}$

Answer: (C) $\mathrm{C_2} = \frac{1000\ \mathrm{d}x_2}{\mathrm{M_1}+x_2(\mathrm{M_2}-\mathrm{M_1})}$ · Key from source paper

Q168 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The average molar mass of chlorine is $35.5\ \mathrm{g\ mol^{-1}}$. The ratio of $^{35}\mathrm{Cl}$ to $^{37}\mathrm{Cl}$ in naturally occurring chlorine is close to :

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

Answer: (B) $3:1$ · Key from source paper

Q169 JEE Main 2020 · 5 Sep · Shift 1 Numerical

The minimum number of moles of O_2 required for complete combustion of 1 mole of propane and 2 moles of butane is.....

Numerical value type: the answer is a number.

Answer: 18. · Key from source paper

Q170 JEE Main 2020 · 4 Sep · Shift 1 Numerical

The mass of ammonia in grams produced when $2.8\ kg$ of dinitrogen quantitatively reacts with $1\ kg$ of dihydrogen is _____

Numerical value type: the answer is a number.

Answer: 3400. · Key from source paper

Q171 JEE Main 2020 · 4 Sep · Shift 2 Numerical

A 100 mL solution was made by adding $1.43\ g$ of $Na_2\ CO_3.xH_2\ O$. The normality of the solution is $0.1\ N$. The value of x is _____
(The atomic mass of Na is $23 g/\ mol$)

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q172 JEE Main 2020 · 3 Sep · Shift 1 Numerical

The mole fraction of glucose $(C_6H_{12}O_6)$ in an aqueous binary solution is 0.1. The mass percentage of water in it, to the nearest integer, is _____ .

Numerical value type: the answer is a number.

Answer: 47. · Key from source paper

Q173 JEE Main 2020 · 3 Sep · Shift 2 MCQ

The strengths of 5. 6 volume hydrogen peroxide (of density $1\ g/\ mL$) in terms of mass percentage and molarity(M) respectively, are: (Take molar mass of hydrogen peroxide as $34\ g/\ mol$)

(A) 1.7 and 0.5

(B) 0.85 and 0.25

(C) 1.7 and 0.25

(D) 0.85 and 0.5

Answer: (A) 1.7 and 0.5 · Key from source paper

Q174 JEE Main 2020 · 3 Sep · Shift 2 Numerical

0.023×10^{22} molecules are present in 10gof a substance 'x'. The molarity of a solution containing 5g of substance 'x' in 2 L solution is _____ $\times 10^{-3}$.

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q175 JEE Main 2020 · 3 Sep · Shift 2 Numerical

The volume (in mL) of 0.1 N NaOH required to neutralise10 mL of 0.1 N phosphinic acid is _____ .

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q176 JEE Main 2020 · 2 Sep · Shift 2 Numerical

The ratio of the mass percentages of 'C & H' and 'C & O' of a saturated acyclic organic compound 'X' are $4:1$ and $3:4$ respectively. Then, the moles of oxygen gas required for complete combustion of two moles of organic compound 'X' is _____

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q177 JEE Main 2020 · 9 Jan · Shift 1 Numerical

The molarity of HNO_3 in a sample which has density 1.4 g/mL and mass percentage of 63% is _____ (Molecular Weight of HNO_3 = 63)

Numerical value type: the answer is a number.

Answer: 14. · Key from source paper

Q178 JEE Main 2020 · 9 Jan · Shift 1 Numerical

The hardness of a water sample containing 10^{-3} M $MgSO_4$ expressed as $CaCO_3$ equivalents (in ppm) is . (molar mass of $MgSO_4$ is 120.37 g/mol)

Numerical value type: the answer is a number.

Answer: 100. · Key from source paper

Q179 JEE Main 2020 · 9 Jan · Shift 1 Numerical

The mass percentage of nitrogen in histamine is _____.

Numerical value type: the answer is a number.

Answer: 37.8. · Key from source paper

Q180 JEE Main 2020 · 9 Jan · Shift 2 Numerical

10.30mg of O_2 is dissolved into a liter of sea water of density $1.03 g/mL$. The concentration of O_2 in ppm is _____.

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q181 JEE Main 2020 · 8 Jan · Shift 1 Numerical

Ferrous sulphate heptahydrate is used to fortify foods with iron. The amount (in grams) of the salt required to achieve 10ppm of iron in 100kg of wheat is _____.
Atomic weight: Fe = 55.85; S = 32.00; O = 16.00

Numerical value type: the answer is a number.

Answer: 4.95. · Key from source paper

Q182 JEE Main 2020 · 8 Jan · Shift 2 Numerical

$NaClO_3$ is used, even in spacecrafts, to produce O_2. The daily consumption of pure O_2 by a person in $492\ L$ at $1\ atm, 300K$. How much amount of $NaClO_3$, in grams, is required to produce O_2 for the daily consumption of a person at $1\ atm, 300K$? ____
$NaClO_3(s) + Fe(s) \rightarrow O_2(g) + NaCl(s) + FeO(s)$
$R = 0.082\ L\ atm\ mol^{-1}\ K^{-1}$

Numerical value type: the answer is a number.

Answer: 2130. · Key from source paper

Q183 JEE Main 2020 · 7 Jan · Shift 1 MCQ

Amongst the following statements, that which was not proposed by Dalton was :

(A) chemical reactions involve reorganization of atoms. These are neither created nor destroyed in a chemical reaction.

(B) all the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass.

(C) when gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T & P.

(D) matter consists of indivisible atoms.

Answer: (C) when gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T & P. · Key from source paper

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Q184 JEE Main 2020 · 7 Jan · Shift 2 MCQ

The ammonia (NH_3) released on quantitative reaction of 0.6 g urea (NH_2CONH_2) with sodium hydroxide ($NaOH$) can be neutralized by

(A) 200 ml of 0.4 N HCl

(B) 200 ml of 0.2 N HCl

(C) 100 ml of 0.2 N HCl

(D) 100 ml of 0.1 N HCl

Answer: (C) 100 ml of 0.2 N HCl · Key from source paper

Q185 JEE Main 2019 · 12 Apr · Shift 1 MCQ

5 moles of AB_2 weigh 125×10^{-3} kg and 10 moles of A_2B_2 weigh 300×10^{-3} kg . The molar mass of A (M_A) in kg mol^{-1} are:

(A) $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$

(B) $M_A = 25 \times 10^{-3}$ and $M_B = 50 \times 10^{-3}$

(C) $M_A = 50 \times 10^{-3}$ and $M_B = 25 \times 10^{-3}$

(D) $M_A = 10 \times 10^{-3}$ and $M_B = 5 \times 10^{-3}$

Answer: (A) $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$ · Key from source paper

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Q186 JEE Main 2019 · 12 Apr · Shift 1 MCQ

The mole fraction of a solvent in aqueous solution of a solute is 0.8 . The molality (in mol kg^{-1}) of the aqueous solution is:

(A) 13.88×10^{-3}

(B) 13.88×10^{-1}

(C) 13.88

(D) 13.88×10^{-2}

Answer: (C) 13.88 · Key from source paper

EdLoop JEE

Q187 JEE Main 2019 · 12 Apr · Shift 2 MCQ

25 g of an unknown hydrocarbon upon burnig produces 88 g of CO_2 and 9g of H_2O. This unknown hydrocarbon contains:

(A) 24 g of carbon and 1 g of hydrogen
(B) 18 g of carbon annd 7 g of hydrogen
(C) 22 g of carbon and 3 g of hydrogen
(D) 20 g carbon and 5 g of hydrogen

Answer: (A) 24 g of carbon and 1 g of hydrogen · Key from source paper

Q188 JEE Main 2019 · 10 Apr · Shift 1 MCQ

At 300 K and 1 atmospheric pressure, 10 mL of a hydrocarbon required 55 mL of O_2 for complete combustion, and 40 mL of CO_2 is formed. The formula of the hydrocarbon is:

(A) C_4H_8
(B) C_4H_{10}
(C) C_4H_6
(D) C_4H_7Cl

Answer: (C) C_4H_6 · Key from source paper

Q189 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The minimum amount of O_2g consumed per gram of reactant is for the reaction:
(Given atomic mass: Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

(A) $P_4s + 5O_2g \rightarrow P_4O_{10}s$
(B) $2\ Mgs + O_2g \rightarrow 2MgOs$
(C) $4Fes + 3O_2g \rightarrow 2Fe_2O_3s$
(D) $C_3H_8g + 5O_2g \rightarrow 3CO_2g + 4H_2O\ (l)$

Answer: (C) $4Fes + 3O_2g \rightarrow 2Fe_2O_3s$ · Key from source paper

Q190 JEE Main 2019 · 9 Apr · Shift 1 MCQ

For a reaction, $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$, identify di-hydrogen ($H_2$) as a limiting reagent in the following reaction mixtures.

(A) 28 g of N_2 + 6 g of H_2
(B) 35 g of N_2 + 8 g of H_2
(C) 56 g of N_2 + 10 g of H_2
(D) 14 g of N_2 + 4 g of H_2

Answer: (C) 56 g of N_2 + 10 g of H_2 · Key from source paper

EdLoop JEE

Q191 JEE Main 2019 · 9 Apr · Shift 2 MCQ

What would be the molality of 20% (mass/mass) aqueous solution of KI ? (molar mass of KI = 166 $\mathrm{g\ mol^{-1}}$)

(A) 1.35
(B) 1.51
(C) 1.08
(D) 1.48

Answer: (B) 1.51 · Key from source paper

Q192 JEE Main 2019 · 8 Apr · Shift 1 MCQ

100 mL of a water sample contains 0.81 g of calcium bicarbonate and 0.73 g of magnesium bicarbonate. The hardness of this water sample expressed in terms of equivalents of $\mathrm{CaCO_3}$ is: (molar mass of calcium bicarbonate is 162 $\mathrm{gm\ mol^{-1}}$ and magnesium bicarbonate is 146 $\mathrm{g\ mol^{-1}}$)

(A) 100 ppm
(B) 1,000 ppm
(C) 5,000 ppm
(D) 10,000 ppm

Answer: (D) 10,000 ppm · Key from source paper

Q193 JEE Main 2019 · 8 Apr · Shift 2 MCQ

The percentage composition of carbon by mole in methane is:

(A) 75 %
(B) 20 %
(C) 80 %
(D) 25 %

Answer: (B) 20 % · Key from source paper

Q194 JEE Main 2019 · 8 Apr · Shift 2 MCQ

0.27 g of a long chain fatty acid was dissolved in 100 $\mathrm{cm^3}$ of hexane. 10 mL of this solution was added dropwise to the surface of water in a round watch glass. Hexane evaporates and a monolayer is formed. The distance from edge to centre of the watch glass is 10 cm . What is the height of the monolayer?
[Density of fatty acid = 0.9 g $\mathrm{cm^{-3}}$; π = 3]

(A) 10^{-4} m
(B) 10^{-6} m
(C) 10^{-8} m
(D) 10^{-2} m

Answer: (B) 10^{-6} m · Key from source paper

Q195 JEE Main 2019 · 12 Jan · Shift 1 MCQ

50 mL of 0 .5 M oxalic acid is needed to neutralize 25 mL of sodium hydroxide solution. What is the amount of NaOH in 50 mL of the given sodium hydroxide solution?

(A) 2 g
(B) 4 g
(C) 1 g
(D) 8 g

Answer: (B) 4 g · Key from source paper

Q196 JEE Main 2019 · 12 Jan · Shift 1 MCQ

What is the hardness of a water sample (in terms of equivalents of $CaCO_3$) containing 10^{-3}M $CaSO_4$? (Molar mass of $CaSO_4$ = 136 g mol^{-1})

(A) 90 ppm
(B) 50 ppm
(C) 10 ppm
(D) 100 ppm

Answer: (D) 100 ppm · Key from source paper

Q197 JEE Main 2019 · 12 Jan · Shift 2 MCQ

8 g of NaOH is dissolved in 18g of H_2O. Mole fraction of NaOH in solution and molality (in mol kg^{-1}) of the solution respectively are:

(A) 0.167, 11.11
(B) 0.167, 22.20
(C) 0.2, 11.11
(D) 0.2, 22.20

Answer: (A) 0.167, 11.11 · Key from source paper

Q198 JEE Main 2019 · 11 Jan · Shift 1 MCQ

A 10mg effervescent tablet containing sodium bicarbonate and oxalic acid releases 0.25 mL of CO_2 at T = 298.15 K and P = 1 bar. If molar volume of CO_2 is 25.0 L under such condition, what is the percentage of sodium bicarbonate in each tablet? [Molar mass of $NaHCO_3$ = 84 g mol^{-1}]

(A) 0.84
(B) 33.6
(C) 16.8
(D) 8.4

Answer: (D) 8.4 · Key from source paper

Q199 JEE Main 2019 · 11 Jan · Shift 2 MCQ

25 mL of the given HCl solution requires 30 mL of 0.1M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30 mL of 0.2M aqueous NaOH solution?

(A) 25 mL
(B) 75 mL
(C) 50 mL
(D) 12.5 mL

Answer: (A) 25 mL · Key from source paper

Q200 JEE Main 2019 · 10 Jan · Shift 1 MCQ

A mixture of 100 m mol of Ca $(OH)_2$ and 2 g of sodium sulphate was dissolved in water and the volume was made up to 100 mL. What is the mass of calcium sulphate formed and the concentration of OH^- in resulting solution, respectively? (Molar mass of Ca $(OH)_2$, Na_2 SO_4 and $CaSO_4$ are 74, 143 and 136 g mol^{-1}, respectively; K_{sp} of Ca $(OH)_2$ is 5.5 $\times 10^{-6}$)

(A) 1.9 g, 0.14 mol L^{-1}
(B) 13.6 g, 0.28 mol L^{-1}
(C) 1.9 g, 0.28 mol L^{-1}
(D) 13.6 g, 0.14 mol L^{-1}

Answer: (C) 1.9 g, 0.28 mol L^{-1} · Key from source paper

Q201 JEE Main 2019 · 10 Jan · Shift 2 MCQ

The amount of sugar $(C_{12}H_{22}O_{11})$ required to prepare $2L$ of its 0.1 M aqueous solution is:

(A) 17.1 g
(B) 136.8 g
(C) 68.4 g
(D) 34.2 g

Answer: (C) 68.4 g · Key from source paper

Q202 JEE Main 2019 · 9 Jan · Shift 1 MCQ

A solution of sodium sulphate contains 92 g of Na^+ ions per kilogram of water. The molality of Na^+ ions in that solution in $mol\ kg^{-1}$ is:

(A) 16
(B) 4
(C) 12
(D) 8

Answer: (B) 4 · Key from source paper

Q203 JEE Main 2019 · 9 Jan · Shift 2 MCQ

For the following reaction, the mass of water produced from $445\ \text{g}$ of $\text{C}_{57}\text{H}_{110}\text{O}_6$ is:
$2\ \text{C}_{57}\text{H}_{110}\text{O}_6(\text{s}) + 163\text{O}_2(\text{g}) \rightarrow 114\ \text{CO}_2(\text{g}) + 110\text{H}_2\text{O}(\text{l})$

(A) $490\ \text{g}$
(B) $890\ \text{g}$
(C) $445\ \text{g}$
(D) $495\ \text{g}$

Answer: (D) $495\ \text{g}$ · Key from source paper

Q204 JEE Main 2018 · 16 Apr · Online MCQ

An unknown chlorohydrocarbon has $3.55\ \%$ of chlorine. If each molecule of the hydrocarbon has one chlorine atom only; chlorine atoms present in 1 g of chlorohydrocarbon are :(Atomic wt. of Cl $= 35.5$ u; Avogadro constant $= 6.023 \times 10^{23}\ \text{mol}^{-1}$)

(A) 6.023×10^{9}
(B) 6.023×10^{23}
(C) 6.023×10^{21}
(D) 6.023×10^{20}

Answer: (D) 6.023×10^{20} · Key from source paper

Q205 JEE Main 2018 · 15 Apr · Shift 1 MCQ

A sample of NaClO_3 is converted by heat to NaCl with a loss of $0.16\ \text{g}$ of oxygen. The residue is dissolved in water and precipitated as AgCl. The mass of AgCl (in g) obtained will be: (Given: Molar mass of $\text{AgCl} = 143.5\ \text{g mol}^{-1}$)

(A) 0.35
(B) 0.54
(C) 0.41
(D) 0.48

Answer: (D) 0.48 · Key from source paper

Q206 JEE Main 2018 · 15 Apr · Shift 2 MCQ

For per gram of reactant, the maximum quantity of N_2 gas is produced in which of the following thermal decomposition reactions? (Given: Atomic wt. : $Cr = 52u,\ Ba = 137u$).

(A) $Ba(N_3)_2\,(s) \longrightarrow Ba(C) + 3\,N_2(g)$
(B) $(NH_4)_2Cr_2O_7(s) \longrightarrow N_2(g) + 4H_2O(g) + Cr_2O_3(s)$
(C) $2NH_3(g) \longrightarrow N_2(g) + 3H_2(g)$
(D) $2NH_4NO_3(s) \longrightarrow 2\,N_2(g) + 4H_2O(g) + O_2(g)$

Answer: (C) $2NH_3(g) \longrightarrow N_2(g) + 3H_2(g)$ · Key from source paper

Q207 JEE Main 2018 · 8 Apr · Offline MCQ

The ratio of mass percent of C and H of an organic compound $(C_XH_YO_Z)$ is $6 : 1$. If one molecule of the above compound $(C_XH_YO_Z)$ contains half as much oxygen as required to burn one molecule of compound C_XH_Y completely to CO_2 and H_2O. The empirical formula of the compound $C_XH_YO_Z$ is

(A) $C_2H_4O_3$
(B) $C_3H_6O_3$
(C) C_2H_4O
(D) $C_3H_4O_2$

Answer: (A) $C_2H_4O_3$ · Key from source paper

Q208 JEE Main 2017 · 9 Apr · Online MCQ

What quantity (in mL) of a 45% acid solution of a mono-protic strong acid must be mixed with a 20% solution of the same acid to produce 800 mL of a 29.875% acid solution?

(A) 316
(B) 320
(C) 325
(D) 330

Answer: (A) 316 · Key from source paper

Q209 JEE Main 2017 · 8 Apr · Online MCQ

Excess of $NaOH$ (aq) was added to 100 mL of $FeCl_3$ (aq) resulting into 2.14 g of $Fe(OH)_3$. The molarity of $FeCl_3$(aq) is:
(Given the molar mass of Fe = 56 g mol^{-1} and molar mass of Cl = 35.5 g mol^{-1})

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(A) 0.3 M
(B) 0.2 M
(C) 0.6 M
(D) 1.8 M

Answer: (B) 0.2 M · Key from source paper

Q210 JEE Main 2017 · 2 Apr · Offline MCQ

1 gram of a carbonate M_2CO_3 on treatment with excess HCl produces 0.01186 moles of CO_2. The molar mass of M_2CO_3 in $gmol^{-1}$ is:

(A) 84.3
(B) 118.6
(C) 11.86
(D) 1186

Answer: (A) 84.3 · Key from source paper

Q211 JEE Main 2017 · 2 Apr · Offline MCQ

The most abundant elements by mass in the body of a healthy human adult are:
Oxygen (61.4%); Carbon (22.9%), Hydrogen (10.0%); and Nitrogen (2.6%). The weight which a 75kg person would gain if all ^1H atoms are replaced by ^2H atoms is:

(A) 37.5 kg
(B) 7.5 kg
(C) 10 kg
(D) 15 kg

Answer: (B) 7.5 kg · Key from source paper

Q212 JEE Main 2016 · 10 Apr · Online MCQ

The volume of 0.1 M strong dibasic acid sufficient to neutralize 1g of a base that furnishes 0.04 mole of OH^- in aqueous solution is :

(A) 400 mL
(B) 600 mL
(C) 200 mL
(D) 800 mL

Answer: (C) 200 mL · Key from source paper

Q213 JEE Main 2016 · 9 Apr · Online MCQ

An organic compound contains C, H and S. The minimum molecular weight of the compound containing 8% Sulphur is

(A) $600\ \text{g mol}^{-1}$
(B) $200\ \text{g mol}^{-1}$
(C) $400\ \text{g mol}^{-1}$
(D) $300\ \text{g mol}^{-1}$

Answer: (C) $400\ \text{g mol}^{-1}$ · Key from source paper

Q214 JEE Main 2016 · 9 Apr · Online MCQ

The amount of arsenic pentasulphide that can be obtained when 35.5 g arsenic acid is treated with excess H_2S in the presence of conc. HCl (assuming 100% conversion) is

(A) 0.25 mol
(B) 0.50 mol
(C) 0.333 mol
(D) 0.125 mol

Answer: (D) 0.125 mol · Key from source paper

Q215 JEE Main 2016 · 9 Apr · Online MCQ

5 L of an alkane requires 25 L of oxygen for its complete combustion. If all volumes are measured at constant temperature and pressure, the alkane is

(A) Isobutane
(B) Ethane
(C) Butane
(D) Propane

Answer: (D) Propane · Key from source paper

Q216 JEE Main 2016 · 3 Apr · Offline MCQ

At 300 K and 1 atm, 15 mL of a gaseous hydrocarbon requires 375 mL air containing 20% O_2 by volume, for complete combustion. After combustion, the gases occupy 345 mL. Assuming that the water formed is in liquid form and the volumes were measured at the same temperature and pressure, the formula of the hydrocarbon is:
(Assume complete combustion of reactant)

(A) C_4H_8
(B) C_4H_{10}
(C) C_3H_6
(D) C_3H_8

Answer: (D) C_3H_8 · Key from source paper

Q217 JEE Main 2015 · 11 Apr · Online MCQ

In the following reaction:
A + 2B + 3C $\rightleftharpoons$ AB_2C_3
6.0 g of A, 6.0×10^{23} atoms of B and 0.036 mol of C reacted and formed 4.8 g of compound AB_2C_3. If atomic mass of A and C are 60 and 80 amu, respectively. What is the atomic mass of B in amu? (Avogadro number$= 6 \times 10^{23}$)

(A) 40 amu
(B) 60 amu
(C) 70 amu
(D) 50 amu

Answer: (D) 50 amu · Key from source paper

Q218 JEE Main 2015 · 10 Apr · Online MCQ

A sample of a hydrate of barium chloride weighing 61 g was heated until all the water of hydration is removed. The dried sample weighed 52 g. The formula of the hydrated salt is: (atomic mass, Ba = 137 amu, Cl = 35.5 amu)

(A) $BaCl_2 \cdot H_2O$
(B) $BaCl_2 \cdot 3H_2O$
(C) $BaCl_2 \cdot 4H_2O$
(D) $BaCl_2 \cdot 2H_2O$

Answer: (D) $BaCl_2 \cdot 2H_2O$ · Key from source paper

Q219 JEE Main 2015 · 4 Apr · Offline MCQ

The molecular formula of a commercial resin used for exchanging ions in water softening is $C_8H_7SO_3Na$ (molecular weight $= 206$). What would be the maximum uptake of Ca^{2+} ions by the resin if expressed in mol per gm?

(A) $\frac{1}{412}$
(B) $\frac{1}{103}$
(C) $\frac{1}{206}$
(D) $\frac{2}{309}$

Answer: (A) $\frac{1}{412}$ · Key from source paper

Q220 JEE Main 2014 · 12 Apr · Online MCQ

The amount of $BaSO_4$ formed upon mixing $100\ mL$ of $20.8\% BaCl_2$ solution with $50\ mL$ of $9.8\%\ H_2SO_4$ solution will be: (Ba $= 137$, Cl $= 35.5$, S $= 32$, H $= 1$ and O $= 16$)

(A) $23.3\ \text{g}$
(B) $11.65\ \text{g}$
(C) $30.6\ \text{g}$
(D) $33.2\ \text{g}$

Answer: (B) $11.65\ \text{g}$ · Checked by our team

Q221 JEE Main 2014 · 11 Apr · Online MCQ

A gaseous compound of nitrogen and hydrogen contains 12.5% (by mass) of hydrogen. The density of the compound relative to hydrogen is 16. The molecular formula of the compound is:

(A) NH_2
(B) N_3H
(C) NH_3
(D) N_2H_4

Answer: (D) N_2H_4 · Key from source paper

Q222 JEE Main 2014 · 9 Apr · Online MCQ

Dissolving 120 g of a compound of (mol. wt. 60) in 1000 g of water gave a solution of density 1.12 g/mL. The molarity of the solution is :

(A) 2.50 M
(B) 1.00 M
(C) 2.00 M
(D) 4.00 M

Answer: (C) 2.00 M · Key from source paper

Q223 JEE Main 2014 · 9 Apr · Online MCQ

The amount of oxygen in 3.6 moles of water is:

(A) 57.6 g
(B) 115.2 g
(C) 18.4 g
(D) 28.8 g

Answer: (A) 57.6 g · Key from source paper

Q224 JEE Main 2014 · 6 Apr · Offline MCQ

The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is 1 : 4. The ratio of number of their molecules is:

(A) 1 : 4
(B) 7 : 32
(C) 1 : 8
(D) 3 : 16

Answer: (B) 7 : 32 · Key from source paper

Q225 JEE Main 2013 · 25 Apr · Online MCQ

6 litres of an alkene require 27 litres of oxygen at constant temperature and pressure for complete combustion. The alkene is :

(A) Ethene
(B) Propene
(C) 1—Butene
(D) 2—Butene

Answer: (B) Propene · Checked by our team

Q226 JEE Main 2013 · 25 Apr · Online MCQ

10 mL of 2(M) NaOH solution is added to 200 mL of 0.5 (M) of NaOH solution. What is the final concentration ?

(A) 0.57(M)
(B) 5.7(M)
(C) 11.4(M)
(D) 1.14(M)

Answer: (A) 0.57(M) · Key from source paper

Q227 JEE Main 2013 · 23 Apr · Online MCQ

Number of atoms in the following samples of substances is largest in:

(A) 4.0 g of hydrogen
(B) 71.0 g of chlorine
(C) 127.0 g of iodine
(D) 48.0 g of magnesium

Answer: (A) 4.0 g of hydrogen · Key from source paper

Q228 JEE Main 2013 · 22 Apr · Online MCQ

The density of 3M solution of sodium chloride is $1.252\ \mathrm{g\ mL^{-1}}$. The molality of the solution will be : (molar mass, $\mathrm{NaCl} = 58.5\ \mathrm{g\ mol^{-1}}$)

(A) $260\ \mathrm{m}$
(B) $2.18\ \mathrm{m}$
(C) $2.79\ \mathrm{m}$
(D) $3.00\ \mathrm{m}$

Answer: (C) $2.79\ \mathrm{m}$ · Key from source paper

Q229 JEE Main 2013 · 7 Apr · Offline MCQ

The molarity of a solution obtained by mixing 750 mL of 0.5(M) HCl with 250 mL of 2(M) HCl will be

(A) 1.75 M
(B) 0.975 M
(C) 0.875 M
(D) 1.00 M

Answer: (C) 0.875 M · Key from source paper

Q230 JEE Main 2013 · 7 Apr · Offline MCQ

A gaseous hydrocarbon on combustion gives 0.72 g of water and 3.08 g CO_2. What is the empirical formula of the hydrocarbon?

(A) C_6H_5
(B) C_7H_8
(C) C_2H_4
(D) C_3H_4

Answer: (B) C_7H_8 · Key from source paper

Q231 AIEEE 2012 · 26 May · Online MCQ

A transition metal M forms a volatile chloride which has a vapour density of 94.8. If it contains 74.75% of chlorine the formula of the metal chloride will be

(A) MCl_3
(B) MCl_2
(C) MCl_4
(D) MCl_5

Answer: (C) MCl_4 · Key from source paper

Q232 AIEEE 2012 · 19 May · Online MCQ

When $CO_{2(g)}$ is passed over red hot coke it partially gets reduced to $CO(g)$. Upon passing $0.5\ \mathrm{L}$ of $CO_2(g)$ over red hot coke, the total volume of the gases increased to $700\ \mathrm{mL}$. The composition of the gaseous mixture at STP is

(A) $CO_2 = 300\ mL; CO = 400\ mL$
(B) $CO_2 = 0.0\ mL; CO = 700\ mL$
(C) $CO_2 = 200\ mL; CO = 500\ mL$
(D) $CO_2 = 350\ mL; CO = 350\ mL$

Answer: (A) $CO_2 = 300\ mL; CO = 400\ mL$ · Key from source paper

Q233 AIEEE 2012 · 12 May · Online MCQ

An aqueous solution of oxalic acid dihydrate contains its 6.3 g in 250ml. The volume of 0.1 N NaOH required to completely neutralize 10ml of this solution

(A) 4ml
(B) 20ml
(C) 2ml
(D) 40ml

Answer: (D) 40ml · Key from source paper

Q234 AIEEE 2012 · 12 May · Online MCQ

5 g of benzene on nitration gave 6.6 g of nitrobenzene. The theoretical yield of the nitrobenzene will be

(A) 4.5 g
(B) 5.6 g
(C) 8.09 g
(D) 6.6 g

Answer: (C) 8.09 g · Key from source paper

Q235 AIEEE 2012 · 12 May · Online MCQ

The ppm level of F^- in a 500 g sample of a tooth paste containing 0.2 g F^- is

(A) 400
(B) 1000
(C) 250
(D) 200

Answer: (A) 400 · Key from source paper

Q236 AIEEE 2012 · 7 May · Online MCQ

The concentrated sulphuric acid that is peddled commercial is $95\% H_2SO_4$ by weight. If the density of this commercial acid is $1.834\ g\ cm^{-3}$, the molarity of this solution is

(A) 17.8M
(B) 12.0M
(C) 10.5M
(D) 15.7M

Answer: (A) 17.8M · Key from source paper

Q237 AIEEE 2012 · 7 May · Online MCQ

The ratio of number of oxygen atoms (O) in 16.0 g ozone (O_3), 28.0 g carbon monoxide (CO) and 16.0 oxygen (O_2) is (Atomic mass : C = 12, O = 16 and Avogadro's constant $N_A = 6.0 \times 10^{23}\ mol^{-1}$)

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

Answer: (D) 1 : 1 : 1 · Key from source paper

Q238 AIEEE 2012 · Offline MCQ

The density of a solution prepared by dissolving $120\ g$ of urea (mol. Mass = $60u$) in $1000\ g$ of water is $1.15\ g/mL$. The molarity of this solution is :

(A) $0.50\ M$
(B) $1.78\ M$
(C) $1.02\ M$
(D) $2.05\ M$

Answer: (D) $2.05\ M$ · Key from source paper

Q239 AIEEE 2011 MCQ

A 5.2 molal aqueous solution of methyl alcohol, CH_3OH, is supplied. What is the mole fraction of methyl alcohol in the solution?

(A) 0.190
(B) 0.086
(C) 0.050
(D) 0.100

Answer: (B) 0.086 · Key from source paper

Q240 AIEEE 2007 MCQ

The density (in $g\ mL^{-1}$) of a 3.60 M sulphuric acid solution that is 29% H_2SO_4 (Molar mass = 98 $g\ mol^{-1}$) by mass will be

(A) 1.64
(B) 1.88
(C) 1.22
(D) 1.45

Answer: (C) 1.22 · Key from source paper

Q241 AIEEE 2007 MCQ

In the reaction. $2Al_{(s)} + 6HCl_{(s)} \longrightarrow 2Al^{3+}_{(aq)} + 6Cl^{-}_{(aq)} + 3H_{2(g)}$,

(A) 6 L $HCl_{(aq)}$ is consumed for every 3 L $H_{2(g)}$ produced
(B) 33.6 L $H_{2(g)}$ is produced regardless of temperature and pressure for every mole Al that reacts
(C) 67.2 L $H_{2(g)}$ at STP is produced for every mole Al that reacts
(D) 11.2 $H_{2(g)}$ at STP is produced for every mole $HCl_{(aq)}$ consumed

Answer: (D) 11.2 $H_{2(g)}$ at STP is produced for every mole $HCl_{(aq)}$ consumed · Key from source paper

Q242 AIEEE 2006 MCQ

How many moles of magnesium phosphate, $Mg_3(PO_4)_2$ will contain 0.25 mole of oxygen atoms?

(A) 0.02
(B) 3.125×10^{-2}
(C) 1.25×10^{-2}
(D) 2.5×10^{-2}

Answer: (B) 3.125×10^{-2} · Key from source paper

Q243 AIEEE 2006 MCQ

Density of a 2.05M solution of acetic acid in water is 1.02 g/mL. The molality of the solution is

(A) $1.14\ mol\ kg^{-1}$
(B) $2.28\ mol\ kg^{-1}$
(C) $3.28\ mol\ kg^{-1}$
(D) $0.44\ mol\ kg^{-1}$

Answer: (B) $2.28\ mol\ kg^{-1}$ · Checked by our team

Q244 AIEEE 2005 MCQ

Two solutions of a substance (non electrolyte) are mixed in the following manner. 480 ml of 1.5 M first solution + 520 mL of 1.2 M second solution. What is the molarity of the final mixture?

(A) 1.20 M
(B) 1.50 M
(C) 1.344 M
(D) 2.70 M

Answer: (C) 1.344 M · Key from source paper

Q245 AIEEE 2005 MCQ

If we consider that $\frac{1}{6}$, in place of $\frac{1}{12}$; mass of carbon atom is taken to be the relative atomic mass unit, the mass of one mole of a substance will

(A) Decrease twice
(B) Increase two fold
(C) Remain unchanged
(D) Be a function of the molecular mass of the substance

Answer: (C) Remain unchanged · Key from source paper

Q246 AIEEE 2005 MCQ

An organic compound having molecular mass 60 is found to contain C = 20%, H = 6.67% and N = 46.67% while rest is oxygen. On heating it gives NH_3 alongwith a solid residue. The solid residue give violet colour with alkaline copper sulphate solution. The compound is

(A) CH_3NCO
(B) CH_3CONH_2
(C) $(NH_2)_2CO$
(D) $CH_3CH_2CONH_2$

Answer: (C) $(NH_2)_2CO$ · Key from source paper

Q247 AIEEE 2004 MCQ

6.02×10^{20} molecules of urea are present in 100ml of its solution. The concentration of urea solution is

(A) $0.001\,M$
(B) $0.1\,M$
(C) $0.02\,M$
(D) $0.01\,M$

Answer: (D) $0.01\,M$ · Key from source paper

Q248 AIEEE 2004 MCQ

To neutralize completely 20 mL of 0.1M aqueous solution of phosphorous acid (H_3PO_3), the volume of 0.1M aqueous KOH solution required is

(A) $10\ \mathrm{mL}$
(B) $60\ \mathrm{mL}$
(C) $40\ \mathrm{mL}$
(D) $20\ \mathrm{mL}$

Answer: (C) $40\ \mathrm{mL}$ · Key from source paper

Q249 AIEEE 2003 MCQ

What volume of hydrogen gas, at 273 K and 1 atm, pressure will be consumed in obtaining 21.6 g of elemental boron (atomic mass $= 10.8$) from the reduction of boron trichloride by hydrogen?

(A) 67.2 L
(B) 44.8 L
(C) 22.4 L
(D) 89.6 L

Answer: (A) 67.2 L · Key from source paper

Q250 AIEEE 2003 MCQ

25ml of a solution of barrium hydroxide on titration with a 0.1 molar solution of hydrochloric acid gave a litre value of 35ml. The molarity of barrium hydroxide solution was

(A) 0.14
(B) 0.28
(C) 0.35
(D) 0.07

Answer: (D) 0.07 · Key from source paper

Q251 AIEEE 2002 MCQ

In a compound C, H and N atoms are present in 9 : 1 : 3.5 by weight. Molecular weight of compound is 108. Molecular formula of compound is

(A) $\mathrm{C_2H_6N_2}$
(B) $\mathrm{C_3H_4N}$
(C) $\mathrm{C_6H_8N_2}$
(D) $\mathrm{C_9H_{12}N_3}$

Answer: (C) $\mathrm{C_6H_8N_2}$ · Key from source paper

Q252 AIEEE 2002 MCQ

Number of atoms in 558.5 gram Fe (at.wt. of Fe = 55.85 g $\mathrm{mol^{-1}}$) is

(A) twice that in 60 g carbon
(B) 6.023×10^{22}
(C) half that in 8g He
(D) $558.5 \times 6.023 \times 10^{23}$

Answer: (A) twice that in 60 g carbon · Key from source paper

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Q253 AIEEE 2002 MCQ

With increase of temperature, which of these changes?

(A) molality
(B) weight fraction of solute
(C) fraction of solute present in water
(D) mole fraction

Answer: (C) fraction of solute present in water · Key from source paper

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