

CHEMISTRY · JEE MAIN

Mole Concept & Stoichiometry

Chapter-wise previous year questions, with answer key

133

PYQS

2020–2025

PAPERS

5

TOPICS

Stoichiometry

Atomic and Molar Mass

Empirical and Molecular Formula

Concentration Terms

Limiting Reagent

- 1 Attempt each question on paper first — they're grouped by topic, newest papers first.
- 2 Check yourself against the answer key at the end.
- 3 Got one wrong? Tap “Step-by-step solution” under it for the full working.

Stuck on a question?

Every question has a free step-by-step solution on PrepWiser — tap “Step-by-step solution” under it.

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Q1 JEE Main 2025 · 4 Apr · Shift 2

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

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/XztWg00u3J](https://www.prepwiser.in/questions/XztWg00u3J)

Q2 JEE Main 2025 · 3 Apr · Shift 2

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) 0.24 mg

(B) 235.7 g

(C) 2.444 g

(D) 236 mg

[Step-by-step solution ► prepwiser.in/questions/37m1rLazGP](https://www.prepwiser.in/questions/37m1rLazGP)

Q3 JEE Main 2025 · 29 Jan · Shift 2

0.1 M solution of KI reacts with excess of H_2SO_4 and KIO_3 solutions. According to equation



Identify the correct statements :

(A) 200 mL of KI solution reacts with 0.004 mol of KIO_3

(B) 200 mL of KI solution reacts with 0.006 mol of H_2SO_4

(C) 0.5 L of KI solution produced 0.005 mol of I_2

(D) Equivalent weight of KIO_3 is equal to ($\frac{\text{Molecular weight}}{5}$)

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

(A) (C) and (D) only

(B) (A) and (B) only

(C) (B) and (C) only

(D) (A) and (D) only

[Step-by-step solution ► prepwiser.in/questions/uZiz2w0f-e](https://www.prepwiser.in/questions/uZiz2w0f-e)

Q4 JEE Main 2025 · 24 Jan · Shift 1

Xg of benzoic acid on reaction with aq NaHCO_3 released CO_2 that occupied 11.2 L volume at STP.

X is _____ g.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/9ZM-XQ-mc1](https://www.prepwiser.in/questions/9ZM-XQ-mc1)

Q5 JEE Main 2025 · 23 Jan · Shift 1

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: $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$

(A) 98.3 mg

(B) 196.2 mg

(C) 150.4 mg

(D) 48.2 mg

Step-by-step solution ► [prepwiser.in/questions/iILOqCuuWT](https://www.prepwiser.in/questions/iILOqCuuWT)

Q6 JEE Main 2025 · 22 Jan · Shift 1

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 $\text{Ca}(\text{OH})_2$. The excess unreacted $\text{Ca}(\text{OH})_2$ 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 $\text{CO}_2(\text{g})$ reacted with exactly half the initial amount of $\text{Ca}(\text{OH})_2$ present in the aqueous solution.]

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/qSuLMhkYvn](https://www.prepwiser.in/questions/qSuLMhkYvn)

Q7 JEE Main 2024 · 8 Apr · Shift 1

Combustion of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) produces CO_2 and water. The amount of oxygen (in g) required for the complete combustion of 900g of glucose is :

[Molar mass of glucose in $\text{g mol}^{-1} = 180$]

(A) 32

(B) 480

(C) 800

(D) 960

Step-by-step solution ► [prepwiser.in/questions/a1LLD_AmWI](https://www.prepwiser.in/questions/a1LLD_AmWI)

Q8 JEE Main 2024 · 5 Apr · Shift 2

The number of moles of methane required to produce 11g $\text{CO}_2(\text{g})$ after complete combustion is : (Given molar mass of methane in g mol^{-1} : 16)

(A) 0.35

(B) 0.25

(C) 0.5

(D) 0.75

Step-by-step solution ► [prepwiser.in/questions/pFbGx9hWua](https://www.prepwiser.in/questions/pFbGx9hWua)

Q9 JEE Main 2024 · 4 Apr · Shift 2

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

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/T23BWwhgGT](https://www.prepwiser.in/questions/T23BWwhgGT)

Q10 JEE Main 2024 · 4 Apr · Shift 1

Xg of ethylamine is subjected to reaction with NaNO_2/HCl followed by water; evolved dinitrogen gas which occupied 2.24L volume at STP. X is _____ $\times 10^{-1}$ g.

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/kDppk44E_v](https://www.prepwiser.in/questions/kDppk44E_v)

Q11 JEE Main 2024 · 1 Feb · Shift 2

10mL of gaseous hydrocarbon on combustion gives 40mL of $\text{CO}_2(\text{g})$ and 50mL of water vapour. Total number of carbon and hydrogen atoms in the hydrocarbon is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/5Qr10yhftE](https://www.prepwisser.in/questions/5Qr10yhftE)

Q12 JEE Main 2024 · 31 Jan · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/3AcI7RsOH3](https://www.prepwisser.in/questions/3AcI7RsOH3)

Q13 JEE Main 2024 · 31 Jan · Shift 2

A sample of CaCO_3 and MgCO_3 weighed 2.21g is ignited to constant weight of 1.152g. The composition of mixture is :

(Given molar mass in gmol^{-1} CaCO_3 : 100, MgCO_3 : 84)

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

[Step-by-step solution ► prepwisser.in/questions/jWBeLbQfen](https://www.prepwisser.in/questions/jWBeLbQfen)

Q14 JEE Main 2024 · 29 Jan · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/LeAyvOiVu-](https://www.prepwisser.in/questions/LeAyvOiVu-)

Q15 JEE Main 2024 · 27 Jan · Shift 2

1 mole of PbS is oxidised by "X" moles of O_3 to get "Y" moles of O_2 . $X + Y =$ _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/HS_4YRv4Vt](https://www.prepwisser.in/questions/HS_4YRv4Vt)

Q16 JEE Main 2024 · 27 Jan · Shift 1

Mass of methane required to produce 22g of CO_2 after complete combustion is _____ g.

(Given Molar mass in g mol^{-1} C = 12.0, H = 1.0, O = 16.0)

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/KbAcQ_RAgU](https://www.prepwisser.in/questions/KbAcQ_RAgU)

Q17 JEE Main 2023 · 13 Apr · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/tKd5iai-Yy](https://www.prepwisser.in/questions/tKd5iai-Yy)

Q18 JEE Main 2023 · 13 Apr · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/JidTj_SMBT](https://www.prepwiser.in/questions/JidTj_SMBT)

Q19 JEE Main 2023 · 12 Apr · Shift 1

The mass of NH_3 produced when 131.8 kg of cyclohexanecarbaldehyde undergoes Tollen's test is _____ kg. (Nearest Integer)

Molar Mass of

C = 12g/mol

N = 14g/mol

O = 16g/mol

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/Hz1iKwzeAJ](https://www.prepwiser.in/questions/Hz1iKwzeAJ)

Q20 JEE Main 2023 · 11 Apr · Shift 2

The volume of hydrogen liberated at STP by treating 2.4g of magnesium with excess of hydrochloric acid is _____ $\times 10^{-2}\text{L}$

Given : Molar volume of gas is 22.4L at STP.

Molar mass of magnesium is 24g mol^{-1}

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/6HZvS9AZR4](https://www.prepwiser.in/questions/6HZvS9AZR4)

Q21 JEE Main 2023 · 10 Apr · Shift 1

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

(A) 1.505×10^{23} and 0.250 mol

(B) 7.527×10^{22} and 0.250 mol

(C) 7.527×10^{23} and 0.125 mol

(D) 7.527×10^{22} and 0.125 mol

[Step-by-step solution ► prepwiser.in/questions/ACW6Njc_m4](https://www.prepwiser.in/questions/ACW6Njc_m4)

Q22 JEE Main 2023 · 6 Apr · Shift 2

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

(A) 7.5 mL

(B) 5.0 mL

(C) 10.0 mL

(D) 2.5 mL

[Step-by-step solution ► prepwiser.in/questions/zHmKRW41qO](https://www.prepwiser.in/questions/zHmKRW41qO)

Q23 JEE Main 2023 · 31 Jan · Shift 1

Zinc reacts with hydrochloric acid to give hydrogen and zinc chloride. The volume of hydrogen gas produced at STP from the reaction of 11.5g of zinc with excess HCl is _____ L (Nearest integer)

(Given : Molar mass of Zn is 65.4g mol^{-1} and Molar volume of H_2 at STP = 22.7L)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/62vDazGqHM](https://www.prepwiser.in/questions/62vDazGqHM)

Q24 JEE Main 2023 · 31 Jan · Shift 2

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) C_9H_8

(B) C_5H_8

(C) $C_{11}H_4$

(D) $C_{11}H_8$

Step-by-step solution ► [prepwisser.in/questions/Kyuwg1B_u2](https://www.prepwisser.in/questions/Kyuwg1B_u2)

Q25 JEE Main 2023 · 29 Jan · Shift 2

The volume of HCl, containing 73 g 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 1 g mol^{-1} respectively.)

Numerical answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/8sxnQiHLS3](https://www.prepwisser.in/questions/8sxnQiHLS3)

Q26 JEE Main 2023 · 29 Jan · Shift 2

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_9H_6

(B) C_6H_6

(C) C_8H_6

(D) C_9H_9

Step-by-step solution ► [prepwisser.in/questions/LIKeogvxqq](https://www.prepwisser.in/questions/LIKeogvxqq)

Q27 JEE Main 2023 · 29 Jan · Shift 2

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 answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/Y8MidJe7M](https://www.prepwisser.in/questions/Y8MidJe7M)

Q28 JEE Main 2023 · 25 Jan · Shift 1

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

Numerical answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/2FXhorDCBq](https://www.prepwisser.in/questions/2FXhorDCBq)

Q29 JEE Main 2022 · 29 Jul · Shift 2

Consider the reaction



The amount of HNO_3 required to produce 110.0 g of 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

Step-by-step solution ► [prepwisser.in/questions/ZnllskCUSQ](https://www.prepwisser.in/questions/ZnllskCUSQ)

Q30 JEE Main 2022 · 26 Jul · Shift 2

A 100mL solution of $\text{CH}_3\text{CH}_2\text{MgBr}$ on treatment with methanol produces 2.24mL of a gas at STP. The weight of gas produced is _____ mg. [nearest integer]

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/VLdQhvRail](https://www.prepwisser.in/questions/VLdQhvRail)

Q31 JEE Main 2022 · 25 Jul · Shift 2

56.0 L of nitrogen gas is mixed with excess 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 answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/Y0Xdtdw_bd](https://www.prepwisser.in/questions/Y0Xdtdw_bd)

Q32 JEE Main 2022 · 25 Jul · Shift 1

SO_2Cl_2 on reaction with excess of water results into acidic mixture



16 moles of NaOH is required for the complete neutralisation of the resultant acidic mixture. The number of moles of SO_2Cl_2 used is :

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

[Step-by-step solution ► prepwisser.in/questions/-8SDt9Oe7Y](https://www.prepwisser.in/questions/-8SDt9Oe7Y)

Q33 JEE Main 2022 · 27 Jun · Shift 1

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 answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/YKjtHtUqG-](https://www.prepwisser.in/questions/YKjtHtUqG-)

Q34 JEE Main 2022 · 26 Jun · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/3zHITcM_Dy](https://www.prepwisser.in/questions/3zHITcM_Dy)

Q35 JEE Main 2022 · 25 Jun · Shift 2

The neutralization occurs when 10 mL of 0.1M acid 'A' is allowed to react with 30 mL of 0.05 M base $\text{M}(\text{OH})_2$. The basicity of the acid 'A' is _____.

[M is a metal]

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/uol9sLn6iS](https://www.prepwisser.in/questions/uol9sLn6iS)

Q36 JEE Main 2022 · 25 Jun · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/eBM_yCGIEr](https://www.prepwiser.in/questions/eBM_yCGIEr)

Q37 JEE Main 2022 · 24 Jun · Shift 2

120 g of an organic compound that contains only carbon and hydrogen gives 330 g of CO_2 and 270 g of water on complete combustion. The percentage of carbon and hydrogen, respectively are

- (A) 25 and 75 (B) 40 and 60
(C) 60 and 40 (D) 75 and 25

[Step-by-step solution ► prepwiser.in/questions/ZIh6MxH7b2](https://www.prepwiser.in/questions/ZIh6MxH7b2)

Q38 JEE Main 2022 · 24 Jun · Shift 1

If a rocket runs on a fuel ($C_{15}H_{30}$) and liquid oxygen, the weight of oxygen required and CO_2 released for every litre of fuel respectively are :

(Given : density of the fuel is 0.756 g/mL)

- (A) 1188 g and 1296 g (B) 2376 g and 2592 g
(C) 2592 g and 2376 g (D) 3429 g and 3142 g

[Step-by-step solution ► prepwiser.in/questions/p0HRzDQ2_W](https://www.prepwiser.in/questions/p0HRzDQ2_W)

Q39 JEE Main 2021 · 31 Aug · Shift 2

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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/GluBMQKEbu](https://www.prepwiser.in/questions/GluBMQKEbu)

Q40 JEE Main 2021 · 27 Aug · Shift 2

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)

[Atomic weight : H = 1.008; C = 12.00; O = 16.00]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/1F6-8W2h2E](https://www.prepwiser.in/questions/1F6-8W2h2E)

Q41 JEE Main 2021 · 25 Jul · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/B7eMNNL73J](https://www.prepwiser.in/questions/B7eMNNL73J)

Q42 JEE Main 2021 · 20 Jul · Shift 2

4g equimolar mixture of NaOH and Na_2CO_3 contains x g of NaOH and y g of Na_2CO_3 . The value of x is _____ g. (Nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/k_Au4X0Uig](https://www.prepwiser.in/questions/k_Au4X0Uig)

Q43 JEE Main 2021 · 20 Jul · Shift 1

An average person needs about 10000 kJ energy per day. The amount of glucose (molar mass = 180.0 g mol^{-1}) needed to meet this energy requirement is _____ g.

(Use : $\Delta_c H(\text{glucose}) = -2700 \text{ kJ mol}^{-1}$)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/ZsUD55F_J8](https://www.prepwiser.in/questions/ZsUD55F_J8)

Q44 JEE Main 2021 · 18 Mar · Shift 1

A reaction of 0.1 mole of Benzylamine with bromomethane gave 23 g of Benzyl trimethyl ammonium bromide. The number of moles of bromomethane consumed in this reaction are $n \times 10^{-1}$, when n = _____. (Round off to the Nearest Integer).

(Given : Atomic masses : C : 12.0 u, H : 1.0 u, N : 14.0 u, Br : 80.0 u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/sFouYLUJX5](https://www.prepwiser.in/questions/sFouYLUJX5)

Q45 JEE Main 2021 · 18 Mar · Shift 1

Complete combustion of 3g 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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/gtweMqi4vs](https://www.prepwiser.in/questions/gtweMqi4vs)

Q46 JEE Main 2021 · 25 Feb · Shift 1

0.4 g mixture of NaOH, Na_2CO_3 and some inert impurities was first titrated with $\frac{N}{10}$ HCl using phenolphthalein as an indicator, 17.5 mL of HCl was required at the end point. After this methyl orange was added and titrated. 1.5 mL of same HCl was required for the next end point. The weight percentage of Na_2CO_3 in the mixture is _____. (Rounded off to the nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/UE4JGsCPuG](https://www.prepwiser.in/questions/UE4JGsCPuG)

Q47 JEE Main 2021 · 24 Feb · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/W01eX640zQ](https://www.prepwiser.in/questions/W01eX640zQ)

Q48 JEE Main 2020 · 5 Sep · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/HXF7T9-xIR](https://www.prepwiser.in/questions/HXF7T9-xIR)

Q49 JEE Main 2020 · 4 Sep · Shift 1

The mass of ammonia in grams produced when 2.8 kg of dinitrogen quantitatively reacts with 1 kg of dihydrogen is ____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/WZvMPb-9dG](https://www.prepwiser.in/questions/WZvMPb-9dG)

Q50 JEE Main 2020 · 4 Sep · Shift 1

A 20.0 mL solution containing 0.2 g impure H_2O_2 reacts completely with 0.316 g of $KMnO_4$ in acid solution. The purity of H_2O_2 (in %) is _____
(mol. wt. of H_2O_2 = 34; mol. wt. of $KMnO_4$ = 158)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/tEHf6utNgU](https://www.prepwiser.in/questions/tEHf6utNgU)

Q51 JEE Main 2020 · 3 Sep · Shift 2

The volume (in mL) of 0.1 N NaOH required to neutralise 10 mL of 0.1 N phosphinic acid is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/f5dmVAaxWE](https://www.prepwiser.in/questions/f5dmVAaxWE)

Q52 JEE Main 2020 · 3 Sep · Shift 2

For the reaction

$2A + 3B + \frac{3}{2}C \rightarrow 3P$, which statement is correct ?

(A) $\frac{dn_A}{dt} = \frac{dn_B}{dt} = \frac{dn_C}{dt}$

(B) $\frac{dn_A}{dt} = \frac{2}{3} \frac{dn_B}{dt} = \frac{3}{4} \frac{dn_C}{dt}$

(C) $\frac{dn_A}{dt} = \frac{3}{2} \frac{dn_B}{dt} = \frac{3}{4} \frac{dn_C}{dt}$

(D) $\frac{dn_A}{dt} = \frac{2}{3} \frac{dn_B}{dt} = \frac{4}{3} \frac{dn_C}{dt}$

[Step-by-step solution ► prepwiser.in/questions/tTvQuWZY61](https://www.prepwiser.in/questions/tTvQuWZY61)

Q53 JEE Main 2020 · 3 Sep · Shift 2

6.023×10^{22} molecules are present in 10 g of a substance 'x'. The molarity of a solution containing 5 g of substance 'x' in 2 L solution is ____ $\times 10^{-3}$

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/u5bBjFdxve](https://www.prepwiser.in/questions/u5bBjFdxve)

Q54 JEE Main 2020 · 2 Sep · Shift 2

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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/5K1wLvEWq5](https://www.prepwiser.in/questions/5K1wLvEWq5)

Q55 JEE Main 2020 · 9 Jan · Shift 2

The first and second ionisation enthalpies of a metal are 496 and 4560 kJ mol⁻¹, respectively. How many moles of HCl and H₂SO₄, respectively, will be needed to react completely with 1 mole of the metal hydroxide ?

(A) 1 and 2

(B) 1 and 0.5

(C) 1 and 1

(D) 2 and 0.5

[Step-by-step solution ► prepwiser.in/questions/PC-yeyvB6i](https://www.prepwiser.in/questions/PC-yeyvB6i)

Q56 JEE Main 2020 · 8 Jan · Shift 1

The volume (in mL) of 0.125 M AgNO₃ required to quantitatively precipitate chloride ions in 0.3 g of [Co(NH₃)₆]Cl₃ is _____.

$$M_{[\text{Co}(\text{NH}_3)_6\text{Cl}_3]} = 267.46 \text{ g/mol}$$

$$M_{\text{AgNO}_3} = 169.87 \text{ g/mol}$$

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/X51jN2OLA-](https://www.prepwiser.in/questions/X51jN2OLA-)

Q57 JEE Main 2020 · 7 Jan · Shift 2

The ammonia (NH₃) released on quantitative reaction of 0.6 g urea (NH₂CONH₂) with sodium hydroxide (NaOH) can be neutralized by :

(A) 200 ml of 0.02 N HCl

(B) 100 ml of 0.2 N HCl

(C) 100 ml of 0.1 HCl

(D) 200 ml of 0.4 N HCl

[Step-by-step solution ► prepwiser.in/questions/-MxXhpt9fK](https://www.prepwiser.in/questions/-MxXhpt9fK)

Atomic and Molar Mass · 8 PYQs

Q58 JEE Main 2025 · 3 Apr · Shift 1

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

Element: Pb, Po, Pr and Pt

(A) Pr

(B) Pt

(C) Po

(D) Pb

[Step-by-step solution ► prepwiser.in/questions/0vmFZppDf5](https://www.prepwiser.in/questions/0vmFZppDf5)

Q59 JEE Main 2023 · 8 Apr · Shift 2

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

[Step-by-step solution ► prepwiser.in/questions/PojWQ3u3us](#)

Q60 JEE Main 2022 · 26 Jul · Shift 2

Hemoglobin contains 0.34% of iron by mass. The number of Fe atoms in 3.3g of hemoglobin is (Given: Atomic mass of Fe is 56 u, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$.)

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

[Step-by-step solution ► prepwiser.in/questions/hcG_RAUI4r](#)

Q61 JEE Main 2022 · 25 Jul · Shift 2

A sample of 4.5 mg of an unknown monohydric alcohol, R-OH was added to methylmagnesium iodide. A gas is evolved and is collected and its volume measured to be 3.1 mL. The molecular weight of the unknown alcohol is _____ g/mol. [Nearest integer]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/8ZXxX-R8m9](#)

Q62 JEE Main 2021 · 1 Sep · Shift 2

The number of atoms in 8g of sodium is $x \times 10^{23}$. The value of x is _____. (Nearest integer)

[Given : $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$

Atomic mass of Na = 23.0 u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/CXUQagZ3Mm](#)

Q63 JEE Main 2021 · 26 Aug · Shift 2

A chloro compound "A".

(i) forms aldehydes on ozonolysis followed by the hydrolysis.

(ii) when vaporized completely 1.53 g of A, gives 448 mL of vapour at STP.

The number of carbon atoms in a molecule of compound A is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/upLHRh0iQg](#)

Q64 JEE Main 2021 · 26 Feb · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/HuSwmSqFTd](https://www.prepwiser.in/questions/HuSwmSqFTd)

Q65 JEE Main 2020 · 6 Sep · Shift 2

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

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

[Step-by-step solution ► prepwiser.in/questions/Lc0YiasKUt](https://www.prepwiser.in/questions/Lc0YiasKUt)

Empirical and Molecular Formula · 15 PYQs

Q66 JEE Main 2025 · 2 Apr · Shift 1

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 _____ g. (Given molar mass in g mol^{-1} C : 12, H : 1, O : 16)

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

[Step-by-step solution ► prepwiser.in/questions/7rfE7Dt7AN](https://www.prepwiser.in/questions/7rfE7Dt7AN)

Q67 JEE Main 2025 · 28 Jan · Shift 1

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 g mol^{-1} of C : 12, H : 1, O : 16, Cl : 35.5)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/A0ZVPsEdkm](https://www.prepwiser.in/questions/A0ZVPsEdkm)

Q68 JEE Main 2025 · 24 Jan · Shift 2

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) $\text{C}_4\text{H}_8\text{O}_2$
(B) $\text{C}_6\text{H}_{12}\text{O}_6$
(C) $\text{C}_4\text{H}_9\text{O}_3$
(D) $\text{C}_6\text{H}_{12}\text{O}_3$

[Step-by-step solution ► prepwiser.in/questions/xYh7IWM8Cb](https://www.prepwiser.in/questions/xYh7IWM8Cb)

Q69 JEE Main 2025 · 23 Jan · Shift 2

0.01 mole of an organic compound (X) containing 10% hydrogen, on complete combustion produced 0.9g H₂O. Molar mass of (X) is _____ g mol⁻¹.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/7CkEvpM9Dc](https://www.prepwisser.in/questions/7CkEvpM9Dc)

Q70 JEE Main 2024 · 5 Apr · Shift 1

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) C₁₄H₂₀O₁₀

(B) C₁₂H₂₂O₁₁

(C) C₁₂H₂₀O₁₂

(D) C₁₁H₁₈O₁₂

[Step-by-step solution ► prepwisser.in/questions/L9GDj8T82m](https://www.prepwisser.in/questions/L9GDj8T82m)

Q71 JEE Main 2023 · 12 Apr · Shift 1

A metal chloride contains 55.0% of chlorine by weight. 100mL vapours of the metal chloride at STP weigh 0.57g. The molecular formula of the metal chloride is

(Given: Atomic mass of chlorine is 35.5u)

(A) MCl₂

(B) MCl₄

(C) MCl₃

(D) MCl

[Step-by-step solution ► prepwisser.in/questions/SixD2mp4Lg](https://www.prepwisser.in/questions/SixD2mp4Lg)

Q72 JEE Main 2023 · 8 Apr · Shift 1

0.5g of an organic compound (X) with 60% carbon will produce _____ × 10⁻¹g of CO₂ on complete combustion.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/3suxMz9KPy](https://www.prepwisser.in/questions/3suxMz9KPy)

Q73 JEE Main 2023 · 25 Jan · Shift 2

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 answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/AilfndC7CM](https://www.prepwisser.in/questions/AilfndC7CM)

Q74 JEE Main 2022 · 28 Jul · Shift 1

On complete combustion of 0.492g of an organic compound containing C, H and O, 0.7938g of CO₂ and 0.4428g of H₂O was produced. The % composition of oxygen in the compound is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/K1S7RQGjjd](https://www.prepwisser.in/questions/K1S7RQGjjd)

Q75 JEE Main 2022 · 28 Jun · Shift 2

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) $\text{C}_4\text{H}_6\text{N}_2$

(B) $\text{C}_2\text{H}_3\text{N}$

(C) $\text{C}_5\text{H}_7\text{N}$

(D) $\text{C}_{10}\text{H}_{14}\text{N}_2$

[Step-by-step solution ► prepwiser.in/questions/BcdCbI5niH](https://www.prepwiser.in/questions/BcdCbI5niH)

Q76 JEE Main 2022 · 28 Jun · Shift 2

The complete combustion of 0.492 g of an organic compound containing 'C', 'H' and 'O' gives 0.793 g of CO_2 and 0.442 g of H_2O . The percentage of oxygen composition in the organic compound is _____. (nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/J5Hhi4ELmr](https://www.prepwiser.in/questions/J5Hhi4ELmr)

Q77 JEE Main 2022 · 27 Jun · Shift 2

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_3COOH , B. HCHO , C. CH_3OOCH_3 , D. CH_3CHO

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/pNBXB969bO](https://www.prepwiser.in/questions/pNBXB969bO)

Q78 JEE Main 2022 · 25 Jun · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/IAEgFTR-te](https://www.prepwiser.in/questions/IAEgFTR-te)

Q79 JEE Main 2021 · 26 Aug · Shift 1

The ratio of number of water molecules in Mohr's salt and potash alum is _____ $\times 10^{-1}$. (Integer answer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/TsGWZ0cB9-](https://www.prepwiser.in/questions/TsGWZ0cB9-)

Q80 JEE Main 2021 · 16 Mar · Shift 1

Complete combustion of 750 g of an organic compound provides 420 g of CO_2 and 210 g of H_2O . The percentage composition of carbon and hydrogen in organic compound is 15.3 and _____ respectively. (Round off to the Nearest Integer).

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/5KKGKjs2god](https://www.prepwiser.in/questions/5KKGKjs2god)

Q81 JEE Main 2025 · 4 Apr · Shift 1

Fortification of food with iron is done using $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$. The mass in grams of the $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ required to achieve 12 ppm of iron in 150 kg of wheat is _____ (Nearest integer)

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

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/keVxqJTFCx](https://www.prepwiser.in/questions/keVxqJTFCx)

Q82 JEE Main 2025 · 28 Jan · Shift 1

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 answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/Lw8JF3MVRL](https://www.prepwiser.in/questions/Lw8JF3MVRL)

Q83 JEE Main 2025 · 28 Jan · Shift 2

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) 32

(B) 40

(C) 55

(D) 45

Step-by-step solution ► [prepwiser.in/questions/pbuSsNz6kc](https://www.prepwiser.in/questions/pbuSsNz6kc)

Q84 JEE Main 2025 · 22 Jan · Shift 2

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 answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/f05bK4htyF](https://www.prepwiser.in/questions/f05bK4htyF)

Q85 JEE Main 2024 · 9 Apr · Shift 1

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 answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/uieu0LaG3k](https://www.prepwiser.in/questions/uieu0LaG3k)

Q86 JEE Main 2024 · 8 Apr · Shift 2

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 answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/5gBjleXk0R](https://www.prepwiser.in/questions/5gBjleXk0R)

Q87 JEE Main 2024 · 8 Apr · Shift 2

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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/yqDyjaVvkb](https://www.prepwiser.in/questions/yqDyjaVvkb)

Q88 JEE Main 2024 · 6 Apr · Shift 1

The density of ' x ' M solution (' x ' molar) of NaOH is 1.12gmL^{-1} , while in molality, the concentration of the solution is 3m (3 molal). Then x is

(Given : Molar mass of NaOH is 40g/mol)

(A) 3.8 (B) 3.0

(C) 3.5 (D) 2.8

[Step-by-step solution ► prepwiser.in/questions/ao7_YxwnTI](https://www.prepwiser.in/questions/ao7_YxwnTI)

Q89 JEE Main 2024 · 4 Apr · Shift 1

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

(A) 20 (B) 4

(C) 2 (D) 0.2

[Step-by-step solution ► prepwiser.in/questions/Q2Plv2wNwb](https://www.prepwiser.in/questions/Q2Plv2wNwb)

Q90 JEE Main 2024 · 31 Jan · Shift 2

The molarity of 1L orthophosphoric acid (H_3PO_4) having 70% purity by weight (specific gravity 1.54gcm^{-3}) is _____ M.

(Molar mass of $\text{H}_3\text{PO}_4 = 98\text{gmol}^{-1}$)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/cgaD7ajBbQ](https://www.prepwiser.in/questions/cgaD7ajBbQ)

Q91 JEE Main 2024 · 30 Jan · Shift 2

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

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

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

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

[Step-by-step solution ► prepwiser.in/questions/vumYktHsKZ](https://www.prepwiser.in/questions/vumYktHsKZ)

Q92 JEE Main 2024 · 30 Jan · Shift 1

The mass of sodium acetate (CH_3COONa) required to prepare 250mL of 0.35M aqueous solution is _____ g. (Molar mass of CH_3COONa is 82.02gmol^{-1})

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/tj3nKWVLQv](https://www.prepwiser.in/questions/tj3nKWVLQv)

Q93 JEE Main 2024 · 29 Jan · Shift 1

A solution of H_2SO_4 is 31.4% H_2SO_4 by mass and has a density of 1.25g/mL. The molarity of the H_2SO_4 solution is _____ M (nearest integer)

[Given molar mass of $\text{H}_2\text{SO}_4 = 98\text{g mol}^{-1}$]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/aIB-t2a_Zs](https://www.prepwiser.in/questions/aIB-t2a_Zs)

Q94 JEE Main 2024 · 27 Jan · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/cndfr_sHhk](https://www.prepwiser.in/questions/cndfr_sHhk)

Q95 JEE Main 2023 · 11 Apr · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/CP2GgppJK5](https://www.prepwiser.in/questions/CP2GgppJK5)

Q96 JEE Main 2023 · 11 Apr · Shift 2

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

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

[Step-by-step solution ► prepwiser.in/questions/aE4trBdIyJ](https://www.prepwiser.in/questions/aE4trBdIyJ)

Q97 JEE Main 2023 · 10 Apr · Shift 2

Given below are two statements: one is labelled as Assertion **A** and the other is labelled as Reason **R**
Assertion **A** : 3.1500g of hydrated oxalic acid dissolved in water to make 250.0mL solution will result in 0.1M oxalic acid solution.

Reason **R** : Molar mass of hydrated oxalic acid is 126g 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

[Step-by-step solution ► prepwiser.in/questions/L-p5bcFEvp](https://www.prepwiser.in/questions/L-p5bcFEvp)

Q98 JEE Main 2023 · 1 Feb · Shift 2

The molality of a 10%(v/v) solution of di-bromine solution in CCl_4 (carbon tetrachloride) is 'x'. $x =$ _____ $\times 10^{-2}\text{M}$. (Nearest integer)

[Given : molar mass of $\text{Br}_2 = 160\text{g mol}^{-1}$

atomic mass of C = 12g mol^{-1}

atomic mass of Cl = 35.5g mol^{-1}

density of dibromine = 3.2g cm^{-3}

density of $\text{CCl}_4 = 1.6\text{g cm}^{-3}$]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/KiKoxKT0LU](https://www.prepwiser.in/questions/KiKoxKT0LU)

Q99 JEE Main 2023 · 30 Jan · Shift 1

Some amount of dichloromethane (CH_2Cl_2) is added to 671.141mL of chloroform (CHCl_3) to prepare $2.6 \times 10^{-3}\text{M}$ 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 $\text{CHCl}_3 = 1.49\text{g cm}^{-3}$

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/-Wmo-9bLAW](https://www.prepwiser.in/questions/-Wmo-9bLAW)

Q100 JEE Main 2023 · 30 Jan · Shift 2

The strength of 50 volume solution of hydrogen peroxide is _____ g/L (Nearest integer).

Given:

Molar mass of H_2O_2 is 34g mol^{-1}

Molar volume of gas at STP = 22.7L

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/W0ZHSZeZ1S](https://www.prepwiser.in/questions/W0ZHSZeZ1S)

Q101 JEE Main 2023 · 25 Jan · Shift 2

What is the mass ratio of ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$, 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 : 2

(B) 1 : 1

(C) 2 : 1

(D) 3 : 1

[Step-by-step solution ► prepwiser.in/questions/q33RIWWtUB](https://www.prepwiser.in/questions/q33RIWWtUB)

Q102 JEE Main 2023 · 24 Jan · Shift 1

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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/RoYRLeoMip](https://www.prepwiser.in/questions/RoYRLeoMip)

Q103 JEE Main 2022 · 27 Jul · Shift 2

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/elCv3DNlg_](https://www.prepwiser.in/questions/elCv3DNlg_)

Q104 JEE Main 2022 · 27 Jul · Shift 1

250g 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, 1 u; C, 12 u; O, 16 u

)

(A) 1.03

(B) 2.06

(C) 3.09

(D) 5.40

[Step-by-step solution ► prepwiser.in/questions/9JDJbjhcgr](https://www.prepwiser.in/questions/9JDJbjhcgr)

Q105 JEE Main 2022 · 26 Jul · Shift 1

Chlorophyll extracted from the crushed green leaves was dissolved in water to make 2L solution of Mg of concentration 48 ppm. 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

24g mol^{-1} ; $N_A = 6.02 \times 10^{23}\text{mol}^{-1}$

)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/sKhPuEIoaN](https://www.prepwiser.in/questions/sKhPuEIoaN)

Q106 JEE Main 2022 · 26 Jul · Shift 1

When 800 mL of 0.5 M 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. (Nearest integer)

(Molar mass of nitric acid is 63 g mol^{-1})

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/R97PfIbjkX](https://www.prepwiser.in/questions/R97PfIbjkX)

Q107 JEE Main 2022 · 26 Jun · Shift 1

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) 12.5 M

(C) 14.0 M

(D) 18.2 M

[Step-by-step solution ► prepwiser.in/questions/qUjKx8Z-cC](https://www.prepwiser.in/questions/qUjKx8Z-cC)

Q108 JEE Main 2022 · 25 Jun · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/cHnsj_JRc4](https://www.prepwiser.in/questions/cHnsj_JRc4)

Q109 JEE Main 2021 · 1 Sep · Shift 2

If 80 g of copper sulphate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is dissolved in deionised water to make 5L of solution. The concentration of the copper sulphate solution is $x \times 10^{-3} \text{ mol L}^{-1}$. The value of x is _____.

[Atomic masses Cu : 63.54u, S : 32u, O : 16u, H : 1u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/VICz8V7DmQ](https://www.prepwiser.in/questions/VICz8V7DmQ)

Q110 JEE Main 2021 · 31 Aug · Shift 1

The molarity of the solution prepared by dissolving 6.3 g of oxalic acid ($\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$) in 250 mL of water in mol 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]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/kHI1ZKjNIV](https://www.prepwiser.in/questions/kHI1ZKjNIV)

Q111 JEE Main 2021 · 26 Aug · Shift 2

100 mL of Na_3PO_4 solution contains 3.45 g of sodium. The molarity of the solution is _____ $\times 10^{-2} \text{ mol L}^{-1}$. (Nearest integer)

[Atomic Masses - Na : 23.0 u, O : 16.0 u, P : 31.0 u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/E3ykvjn1zC](https://www.prepwiser.in/questions/E3ykvjn1zC)

Q112 JEE Main 2021 · 26 Aug · Shift 1

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

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/Z0rfISsoGF](https://www.prepwiser.in/questions/Z0rfISsoGF)

Q113 JEE Main 2021 · 22 Jul · Shift 2

If the concentration of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in blood is 0.72 g L^{-1} , the molarity of glucose in blood is _____ $\times 10^{-3} \text{ M}$. (Nearest integer)

[Given : Atomic mass of C = 12, H = 1, O = 16 u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/7tGim3hv3w](https://www.prepwiser.in/questions/7tGim3hv3w)

Q114 JEE Main 2021 · 18 Mar · Shift 2

10.0 mL of Na_2CO_3 solution is titrated against 0.2 M HCl solution. The following titre values were obtained in 5 readings :

4.8 mL, 4.9 mL, 5.0 mL, 5.0 mL and 5.0 mL

Based on these readings, and convention of titrimetric estimation the concentration of Na_2CO_3 solution is _____ mM.

(Round off to the Nearest Integer).

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/3Ubg7kh-Dv](https://www.prepwiser.in/questions/3Ubg7kh-Dv)

Q115 JEE Main 2021 · 17 Mar · Shift 1

The mole fraction of a solute in a 100 molal aqueous solution is _____ $\times 10^{-2}$. (Round off to the Nearest Integer).

[Given : Atomic masses : H : 1.0 u, O : 16.0 u]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/Ah6660gjtK](https://www.prepwiser.in/questions/Ah6660gjtK)

Q116 JEE Main 2021 · 26 Feb · Shift 2

The NaNO_3 weighed out to make 50 mL of an aqueous solution containing 70.0 mg Na^+ per mL is _____ g. (Rounded off to the nearest integer)

[Given : Atomic weight in g mol^{-1} - Na : 23; N : 14; O : 16]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/nn-lGFuEwt](https://www.prepwiser.in/questions/nn-lGFuEwt)

Q117 JEE Main 2021 · 24 Feb · Shift 1

4.5 g of compound A (MW = 90) was used to make 250 mL of its aqueous solution. The molarity of the solution in M is $x \times 10^{-1}$.

The value of x is _____. (Rounded off to the nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/VxKT0Ix0zG](https://www.prepwiser.in/questions/VxKT0Ix0zG)

Q118 JEE Main 2020 · 6 Sep · Shift 1

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

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

(B) $C_2 = \frac{1000dx_2}{M_1 + x_2(M_2 - M_1)}$

(C) $C_2 = \frac{dx_2}{M_1 + x_2(M_2 - M_1)}$

(D) $C_2 = \frac{dx_1}{M_1 + x_2(M_2 - M_1)}$

Step-by-step solution ► [prepwisser.in/questions/zqHb54n7vN](https://www.prepwisser.in/questions/zqHb54n7vN)

Q119 JEE Main 2020 · 4 Sep · Shift 2

A 100 mL solution was made by adding 1.43 g of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$. The normality of the solution is 0.1 N. The value of x is ____.

(The atomic mass of Na is 23 g/mol)

Numerical answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/FIkQHkziXD](https://www.prepwisser.in/questions/FIkQHkziXD)

Q120 JEE Main 2020 · 3 Sep · Shift 1

The mole fraction of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in an aqueous binary solution is 0.1. The mass percentage of water in it, to the nearest integer, is ____.

Numerical answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/X9-n_2Fb6d](https://www.prepwisser.in/questions/X9-n_2Fb6d)

Q121 JEE Main 2020 · 3 Sep · Shift 2

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) 0.85 and 0.5

(B) 0.85 and 0.25

(C) 1.7 and 0.25

(D) 1.7 and 0.5

Step-by-step solution ► [prepwisser.in/questions/SoBs4jF9GM](https://www.prepwisser.in/questions/SoBs4jF9GM)

Q122 JEE Main 2020 · 9 Jan · Shift 1

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 answer — enter the value.

Step-by-step solution ► [prepwisser.in/questions/CzjpGJIY7t](https://www.prepwisser.in/questions/CzjpGJIY7t)

Q123 JEE Main 2020 · 9 Jan · Shift 1

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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/cuve0yP2eq](https://www.prepwiser.in/questions/cuve0yP2eq)

Q124 JEE Main 2020 · 8 Jan · Shift 1

Ferrous sulphate heptahydrate is used to fortify foods with iron. The amount (in grams) of the salt required to achieve 10 ppm of iron in 100 kg of wheat is _____.

Atomic weight : Fe = 55.85; S = 32.00; O = 16.00

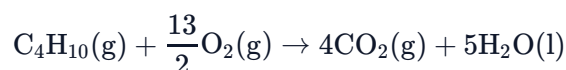
Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/T46ZwkYkBu](https://www.prepwiser.in/questions/T46ZwkYkBu)

Limiting Reagent · 9 PYQs

Q125 JEE Main 2025 · 7 Apr · Shift 2

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



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 answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/N7_LMzjR_5](https://www.prepwiser.in/questions/N7_LMzjR_5)

Q126 JEE Main 2025 · 2 Apr · Shift 1



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 35.5 g mol^{-1} , respectively)

(A) 3.908 g

(B) 2.636 g

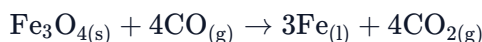
(C) 10.545 g

(D) 5.272 g

[Step-by-step solution ► prepwiser.in/questions/n3_rCLaSZc](https://www.prepwiser.in/questions/n3_rCLaSZc)

Q127 JEE Main 2025 · 24 Jan · Shift 1

Consider the following reaction occurring in the blast furnace:



'x' kg of iron is produced when $2.32 \times 10^3 \text{ kg Fe}_3\text{O}_4$ and $2.8 \times 10^2 \text{ kg CO}$ are brought together in the furnace. The value of 'x' is _____. (nearest integer)

{Given: molar mass of $\text{Fe}_3\text{O}_4 = 232 \text{ g mol}^{-1}$

molar mass of $\text{CO} = 28 \text{ g mol}^{-1}$

molar mass of $\text{Fe} = 56 \text{ g mol}^{-1}$ }

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/u3gldRyFcE](https://www.prepwiser.in/questions/u3gldRyFcE)

Q128 JEE Main 2025 · 23 Jan · Shift 2

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}

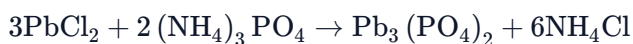
Molar mass of O is 16.0 g mol^{-1}

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/oun6YDTQ1M](https://www.prepwiser.in/questions/oun6YDTQ1M)

Q129 JEE Main 2024 · 1 Feb · Shift 1

Consider the following reaction :



If 72 mmol of PbCl_2 is mixed with 50 mmol of $(\text{NH}_4)_3\text{PO}_4$, then the amount of $\text{Pb}_3(\text{PO}_4)_2$ formed is _____ mmol (nearest integer).

Numerical answer — enter the value.

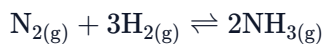
[Step-by-step solution ► prepwiser.in/questions/tfsp2xueta](https://www.prepwiser.in/questions/tfsp2xueta)

Q130 JEE Main 2023 · 6 Apr · Shift 1

If 5 moles of BaCl_2 is mixed with 2 moles of Na_3PO_4 , the maximum number of moles of $\text{Ba}_3(\text{PO}_4)_2$ formed is _____ (Nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/xXAHKVmUIL](https://www.prepwiser.in/questions/xXAHKVmUIL)



20g 5g

Consider the above reaction, the limiting reagent of the reaction and number of moles of NH_3 formed respectively are :

(A) H_2 , 1.42 moles

(B) H_2 , 0.71 moles

(C) N_2 , 1.42 moles

(D) N_2 , 0.71 moles

[Step-by-step solution ► prepwiser.in/questions/XE22gNBoAs](https://www.prepwiser.in/questions/XE22gNBoAs)

In the given reaction,

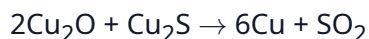


if one mole of each of X and Y with 0.05mol of Z gives compound XYZ_3 . (Given : Atomic masses of X, Y and Z are 10, 20 and 30 amu, respectively.) The yield of XYZ_3 is _____ g. (Nearest integer)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/WW9tvIEYJu](https://www.prepwiser.in/questions/WW9tvIEYJu)

Blister copper is produced by reaction of copper oxide with copper sulphide.



When 2.86×10^3 g of Cu_2O and 4.77×10^3 g of Cu_2S are used for reaction, the mass of copper produced is _____ g. (nearest integer)

(Atomic mass of Cu = 63.5 a.m. u, S = 32.0 a.m. u, O = 16.0 a.m. u)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/mRB9MS9swb](https://www.prepwiser.in/questions/mRB9MS9swb)

Answer key — Mole Concept & Stoichiometry

Numbers match the question numbers above. For full working, open the solution link under each question.

1	63	2	D	3	D	4	61	5	B	6	45	7	D	8	B
9	95	10	45	11	14	12	50	13	B	14	4	15	8	16	8
17	100	18	1	19	60	20	224	21	D	22	C	23	4	24	A
25	15	26	C	27	200	28	12	29	C	30	3	31	46	32	C
33	2	34	225	35	3	36	5418	37	D	38	C	39	13	40	19
41	464	42	1	43	667	44	3	45	18	46	4	47	8	48	18
49	3400	50	85	51	10	52	D	53	25	54	5	55	B	56	26
57	B	58	A	59	A	60	C	61	33	62	2	63	3	64	8
65	C	66	C	67	1655	68	D	69	100	70	B	71	A	72	11
73	12	74	46	75	D	76	46	77	2	78	25	79	5	80	3
81	9	82	125	83	A	84	57	85	164	86	74	87	22	88	B
89	D	90	11	91	C	92	7	93	4	94	7	95	36	96	B
97	C	98	139	99	148	100	150	101	C	102	180	103	1	104	B
105	24	106	54	107	C	108	0	109	64	110	20	111	50	112	3
113	4	114	50	115	64	116	13	117	2	118	B	119	10	120	47
121	D	122	14	123	100	124	4	125	138	126	C	127	420	128	153
129	24	130	1	131	C	132	2	133	3810						

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