

JEE MAIN SOME BASIC CONCEPTS OF CHEMISTRY — PYQS
Max. Marks: 140
Questions: 35
Section A (MCQ) — 25 questions
Q.1 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 : [JEE Main 2026 (Online) 8th April Evening Shift]

- (1) A-IV, B-III, C-I, D-II (2) A-III, B-II, C-IV, D-I
-
- (3) A-III, B-IV, C-II, D-I (4) A-III, B-IV, C-I, D-II

 Scan or tap for the
full solution

Q.2 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.)

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) FeO (2) Fe
- ₂
- O
- ₃
- (3) Fe
- ₃
- O
- ₄
- (4) FeO
- ₃

 Scan or tap for the
full solution

Q.3 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 : [JEE Main 2026 (Online) 6th April Evening Shift]

- (1) A and B only (2) B and C only
-
- (3) C and D only (4) A, C and E only

 Scan or tap for the
full solution

Q.4 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)

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) 1.08 g (2) 2.16 g (3) 3.24 g (4) 4.32 g

 Scan or tap for the
full solution

Q.5 What volume of hydrogen gas at STP would be liberated by action of 50 mL of H₂SO₄ 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.)

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) 5.824 L (2) 7.428 L (3) 6.892 L (4) 8.375 L

 Scan or tap for the
full solution

Q.6 Number of moles and number of molecules in 1.4187 L of SO₂ at STP respectively are

[JEE Main 2026 (Online) 4th April Morning Shift]

- (1) 0.1266;
- 3.812×10^{22}
-
- (2) 0.0633;
- 3.812×10^{22}
-
- (3) 0.1266;
- 7.6238×10^{22}
-
- (4) 0.0633;
- 7.6238×10^{22}

 Scan or tap for the
full solution

Q.7 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 : [JEE Main 2026 (Online) 4th April Evening Shift]

- (1) C > A > B (2) C > B > A
-
- (3) B > C > A (4) B > A > C

 Scan or tap for the
full solution

Q.8 The mass of iron converted into Fe₃O₄ 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 :

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 2.1 g (2) 4.2 g (3) 21 g (4) 42 g

Scan or tap for the
full solution



Q.9 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 $\text{CO}_2(\text{g})$ 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)

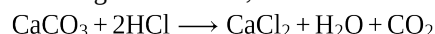
[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) 5.68 (2) 11.44 (3) 22.74 (4) 17.05

Scan or tap for the
full solution



Q.10 For the given reaction;



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.

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) 64.97 g of HCl remains unreacted
(2) 60.32 g of HCl remains unreacted
(3) 32.85 g of CaCO_3 remains unreacted
(4) 97.30 g of HCl reacted

Scan or tap for the
full solution



Q.11 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 :-

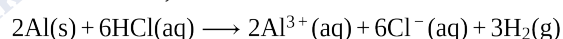
[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) 59.5% (2) 72.5% (3) 97.5% (4) 81.5%

Scan or tap for the
full solution



Q.12 In the reaction,



[JEE Main 2026 (Online) 22nd January Morning Shift]

(1) 12 L $\text{HCl}(\text{aq})$ is consumed for every 6 L $\text{H}_2(\text{g})$ produced.

(2) 11.2 L $\text{H}_2(\text{g})$

at STP is produced for every mole of HCl consumed.

(3) 33.6 L $\text{H}_2(\text{g})$

is produced regardless of temperature and pressure for every mole of Al that reacts.

(4) 67.2 L $\text{H}_2(\text{g})$

at STP is produced for every mole of Al that reacts.

Scan or tap for the
full solution



Q.13 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)

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 0.9 (2) 0.663 (3) 0.1 (4) 0.337

Scan or tap for the
full solution



Q.14 $\text{A} + 2\text{B} \longrightarrow \text{AB}_2$

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 :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) A and C Only (2) A and B Only
(3) C and D Only (4) B and D Only

Scan or tap for the
full solution



Q.15 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]

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) The limiting reagent is calcium metal.
(2) 33.3 g of CaCl_2 is produced.
(3) 7.84 L of H_2 gas is evolved.
(4) 0.35 mol of H_2 gas is evolved.

Scan or tap for the
full solution



Q.16 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 :

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) C_2H_2 (2) C_2H_4 (3) C_4H_{10} (4) C_2H_6

Scan or tap for the full solution



Q.17 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)

[JEE Main 2026 (Online) 21st January Evening Shift]

- (1) 14.2 (2) 21.3 (3) 7.1 (4) 71

Scan or tap for the full solution



Q.18 Among 10^{-9} g (each) of the following elements, which one will have the highest number of atoms? Element: Pb, Po, Pr and Pt

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) Pr (2) Pt (3) Po (4) Pb

Scan or tap for the full solution



Q.19 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 $24\ g\ mol^{-1}$.

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 0.24 mg (2) 235.7 g (3) 2.444 g (4) 236 mg

Scan or tap for the full solution



Q.20 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 up to the mark with distilled water. The solution in this flask is :

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 0.2 M NaCl solution (2) 20 M HCl solution
(3) Neutral solution (4) 10 M HCl solution

Scan or tap for the full solution



Q.21 $CaCO_3(s) + 2HCl(aq) \longrightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$
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 $35.5\ g\ mol^{-1}$, respectively)

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) 3.908 g (2) 2.636 g
(3) 10.545 g (4) 5.272 g

Scan or tap for the full solution



Q.22 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)

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) 60 (2) 45 (3) 30 (4) 15

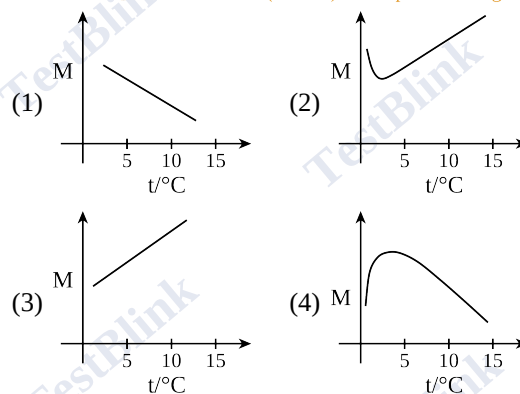
Scan or tap for the full solution



Q.23 '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]

[JEE Main 2025 (Online) 2nd April Evening Shift]



Scan or tap for the full solution



Q.24 Choose the **correct** statements.
Choose the **correct** answer from the options given below :

- 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.

[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) (B), (C) and (D) Only
 (2) (A), (B) and (C) Only
 (3) (C), (D) and (E) Only
 (4) (A), (D) and (E) Only

Scan or tap for the full solution



Q.25 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.

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) 32 (2) 40 (3) 55 (4) 45

Scan or tap for the full solution



Section B (Numerical) — 10 questions

Q.26 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 _____ × 10⁻¹. (Nearest integer)
 Given : Molar mass of HCl and Ba(OH)₂ are 36.5 and 171.0 g mol⁻¹ respectively.

[JEE Main 2026 (Online) 23rd January Morning Shift]

Scan or tap for the full solution



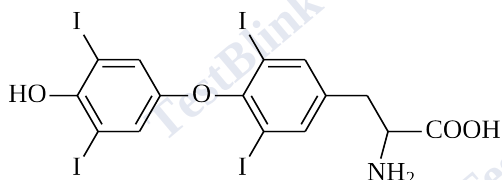
Q.27 20 mL of sodium iodide solution gave 4.74 g silver iodide when treated with excess of silver nitrate solution. The molarity of the sodium iodide solution is _____ M. (Nearest Integer value)
 (Given : Na = 23, I = 127, Ag = 108, N = 14, O = 16 g mol⁻¹)

[JEE Main 2025 (Online) 8th April Evening Shift]

Scan or tap for the full solution



Q.28 Thyroxine, the hormone, has the structure given below



The percentage of iodine in thyroxine is _____. (nearest integer)

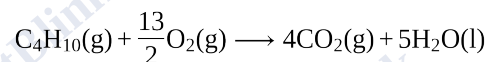
(Given molar mass in g mol⁻¹ C : 12, H : 1, O : 16, N : 14, I : 127)

[JEE Main 2025 (Online) 7th April Morning Shift]

Scan or tap for the full solution



Q.29 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 O₂, 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]

[JEE Main 2025 (Online) 7th April Evening Shift]

Scan or tap for the full solution



Q.30 Fortification of food with iron is done using FeSO₄·7H₂O. The mass in grams of the FeSO₄·7H₂O 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]

[JEE Main 2025 (Online) 4th April Morning Shift]

Scan or tap for the full solution



Q.31 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

[JEE Main 2025 (Online) 4th April Evening Shift]

Scan or tap for the full solution



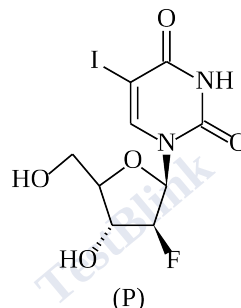
Q.32 X g of nitrobenzene on nitration gave 4.2 g of m-dinitrobenzene. X = _____ g. (nearest integer)
 [Given : molar mass (in g mol⁻¹) C : 12, H : 1, O : 16, N : 14]

[JEE Main 2025 (Online) 3rd April Evening Shift]

Scan or tap for the full solution



Q.33 0.1 mol of the following given antiviral compound (P) will weigh _____ × 10⁻¹ g (nearest integer).



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

[JEE Main 2025 (Online) 2nd April Morning Shift]

Scan or tap for the full solution



Q.34 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}]

[JEE Main 2025 (Online) 28th January Morning Shift]

Scan or tap for the full solution



Q.35 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)

[JEE Main 2025 (Online) 28th January Morning Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ) — 25 questions

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	2	4	2	3	2	4	4	2	1	4
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	2	4	4	2	1	3	1	4	2	3	3
Ques.	23	24	25								
Ans.	4	3	1								

Section B (Numerical) — 10 questions

Ques.	26	27	28	29	30	31	32
Ans.	1825	1	65	138	9	63	3
Ques.	33	34	35				
Ans.	372	125	1655				