

PYQSide

JEE MAIN SOME BASIC CONCEPTS OF CHEMISTRY — STOICHIOMETRY AND STOICHIOMETRIC CALCULATIONS — PYQS

Max. Marks: 60

Questions: 15

Section A (MCQ)

- Q.1** 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.2** 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

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- Q.3** 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

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- Q.4** 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 CO₂(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.5** For the given reaction;
 $\text{CaCO}_3 + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
If 90 g CaCO₃ 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 CaCO₃ remains unreacted
(4) 97.30 g of HCl reacted

Scan or tap for the full solution



- Q.6** In the reaction,
 $2\text{Al(s)} + 6\text{HCl(aq)} \longrightarrow 2\text{Al}^{3+}(\text{aq}) + 6\text{Cl}^{-}(\text{aq}) + 3\text{H}_2(\text{g})$

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

- (1) 12 L HCl(aq) is consumed for every 6 L H₂(g) produced.
(2) 11.2 L H₂(g) at STP is produced for every mole of HCl consumed.
(3) 33.6 L H₂(g) is produced regardless of temperature and pressure for every mole of Al that reacts.
(4) 67.2 L H₂(g) at STP is produced for every mole of Al that reacts.

Scan or tap for the full solution



- Q.7** $\text{A} + 2\text{B} \longrightarrow \text{AB}_2$
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 AB₂ is formed.
C. Molar mass of AB₂ 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

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full solution



Q.8 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.9 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.10 Aqueous HCl reacts with $\text{MnO}_2(\text{s})$ to form $\text{MnCl}_2(\text{aq})$, $\text{Cl}_2(\text{g})$, and $\text{H}_2\text{O}(\text{l})$. What is the weight (in g) of Cl_2 liberated when 8.7 g of $\text{MnO}_2(\text{s})$ 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

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full solution



Q.11 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

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full solution



Q.12 $\text{CaCO}_3(\text{s}) + 2\text{HCl}(\text{aq}) \longrightarrow \text{CaCl}_2(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
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

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full solution



Section B (Numerical)

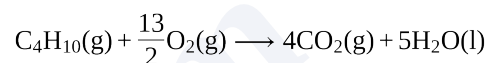
Q.13 20 mL of sodium iodide solution gave 4.74 g silver iodide when treated with excess of silver nitrate solution. The molarity of the sodium iodide solution is _____ M. (Nearest Integer value)
(Given : Na = 23, I = 127, Ag = 108, N = 14, O = 16 g mol^{-1})

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

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full solution



Q.14 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}]

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

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full solution



Q.15 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]

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ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	3	4	2	1	2	4	2	1	3	4
Ques.	12										
Ans.	3										

Section B (Numerical)

Ques.	13	14	15				
Ans.	1	138	3				