PYQSide

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

Max. Marks: 60 **Questions:** 15

Section A (MCQ) — 12 questions

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 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.
[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.3 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 :
[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.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 $CO_2(g)$ 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)
[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;
$CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$
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.
[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.6 In the reaction,
$2Al(s) + 6HCl(aq) \longrightarrow 2Al^{3+}(aq) + 6Cl^-(aq) + 3H_2(g)$
[JEE Main 2026 (Online) 22nd January Morning Shift]
(1) 12 L HCl(aq) is consumed for every 6 L $H_2(g)$ produced.
(2) 11.2 L $H_2(g)$ at STP is produced for every mole of HCl consumed.
(3) 33.6 L $H_2(g)$ is produced regardless of temperature and pressure for every mole of Al that reacts.
(4) 67.2 L $H_2(g)$ at STP is produced for every mole of Al that reacts.
Scan or tap for the full solution

Q.7 $A + 2B \longrightarrow AB_2$
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 :
[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.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 $MnO_2(s)$ 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.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

Scan or tap for the full solution

Q.12 $CaCO_3(s) + 2HCl(aq) \longrightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$
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

Section B (Numerical) — 3 questions

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]

Scan or tap for the full solution

Q.14 Butane reacts with oxygen to produce carbon dioxide and water following the equation given below.

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

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}]

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

Scan or tap for the 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]

Scan or tap for the full solution

ANSWER KEY

Section A (MCQ) — 12 questions

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) — 3 questions

Ques.	13	14	15				
Ans.	**1**	**138**	**3**				