

## JEE MAIN PRINCIPLES RELATED TO PRACTICAL CHEMISTRY — QUANTITATIVE ANALYSIS OF ORGANIC COMPOUNDS — PYQS

**Max. Marks: 104**
**Questions: 26**

### Section A (MCQ) — 10 questions

- Q.1** Complete combustion of X g of an organic compound gave 0.25 g of  $\text{CO}_2$  and 0.12 g of  $\text{H}_2\text{O}$ . If the % of carbon is 25% and of hydrogen is 4.89%, then  $X = \text{_____} \times 10^{-3}$  g. (Nearest integer) (Molar mass of C, H and O are 12, 1 and 16  $\text{g mol}^{-1}$  respectively.)

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

- (1) 273      (2) 27      (3) 2730      (4) 227

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- Q.2** A student has been given 0.314 g of an organic compound and asked to estimate sulphur. During the experiment, the student has obtained 0.4813 g of barium sulphate. The percentage of sulphur present in the compound is \_\_\_\_\_. (Given molar mass in  $\text{g mol}^{-1}$  S : 32,  $\text{BaSO}_4$  : 233)

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

- (1) 63.15%      (2) 21.05%  
(3) 48.24%      (4) 42.10%

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- Q.3** In Carius method 0.2425 g of an organic compound gave 0.5253 g silver chloride. The percentage of chlorine in the organic compound is

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

- (1) 87.65%      (2) 53.58%  
(3) 37.57%      (4) 34.79%

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- Q.4** When 1 g of compound (X) is subjected to Kjeldahl's method for estimation of nitrogen, 15 mL 1 M  $\text{H}_2\text{SO}_4$  was neutralized by ammonia evolved. The percentage of nitrogen in compound (X) is :

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

- (1) 0.21      (2) 21      (3) 42      (4) 0.42

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- Q.5** In Carius method, 0.75 g of an organic compound gave 1.2 g of barium sulphate, find percentage of sulphur (molar mass 32  $\text{g mol}^{-1}$ ). Molar mass of barium sulphate is 233  $\text{g mol}^{-1}$ .

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

- (1) 4.55%      (2) 16.48%  
(3) 10.30%      (4) 21.97%

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- Q.6** By usual analysis, 1.00 g of compound (X) gave 1.79 g of magnesium pyrophosphate. The percentage of phosphorus in compound (X) is : (nearest integer)

(Given, molar mass in  $\text{g mol}^{-1}$ : O = 16, Mg = 24, P = 31) [JEE Main 2026 (Online) 21st January Evening Shift]

- (1) 40      (2) 30      (3) 20      (4) 50

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- Q.7** On combustion 0.210 g of an organic compound containing C, H and O gave 0.127 g  $\text{H}_2\text{O}$  and 0.307 g  $\text{CO}_2$ . The percentages of hydrogen and oxygen in the given organic compound respectively are:

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

- (1) 7.55, 43.85      (2) 6.72, 53.41  
(3) 6.72, 39.87      (4) 53.41, 39.6

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- Q.8** In Dumas' method for estimation of nitrogen 0.4 g of an organic compound gave 60 mL of nitrogen collected at 300 K temperature and 715 mm Hg pressure. The percentage composition of nitrogen in the compound is (Given : Aqueous tension at 300 K = 15 mm Hg)

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

- (1) 15.71%      (2) 17.46%      (3) 7.85%      (4) 20.95%

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- Q.9** In Dumas' method for estimation of nitrogen, 0.5 gram of an organic compound gave 60 mL of nitrogen collected at 300 K temperature and 715 mm Hg pressure. The percentage composition of nitrogen in the compound (Aqueous tension at 300 K = 15 mm Hg) is \_\_\_\_%.

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

- (1) 20.87 (2) 12.57 (3) 1.257 (4) 18.67

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- Q.10** Given below are two statements I and II.

**Statement-I:** Dumas method is used for estimation of "Nitrogen" in an organic compound.

**Statement-II:** Dumas method involves the formation of ammonium sulphate by heating the organic compound with conc  $\text{H}_2\text{SO}_4$ .

In the light of the above statements, choose the correct answer from the options given below

[JEE Main 2025 (Online) 24th January Morning Shift]

- (1) Statement-I is true but Statement-II is false  
(2) Statement-I is false but Statement-II is true  
(3) Both Statement-I and Statement-II are true  
(4) Both Statement-I and Statement-II are false

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## Section B (Numerical) — 16 questions

- Q.11** In an estimation of sulphur by Carius method 0.2 g of the substance gave 0.6 g of  $\text{BaSO}_4$ . The percentage of sulphur in the substance is \_\_\_\_%. (Given molar mass in  $\text{g mol}^{-1}$  S : 32,  $\text{BaSO}_4$  : 233)

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

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- Q.12** 2.0 g of a bromo hydrocarbon (X) was subjected to Carius analysis, gave 3.36 g of  $\text{AgBr}$ . The percentage of carbon in the compound (X) is 26.7%. Total number of carbon atoms in the empirical formula for compound (X) is \_\_\_\_\_. (Given molar mass in  $\text{g mol}^{-1}$  H : 1, C : 12, Br : 80, Ag : 108)

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

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- Q.13** In sulphur estimation,  $2.0 \times 10^{-3}$  mol of an organic compound (X) (molar mass  $76 \text{ g mol}^{-1}$ ) gave 0.4813 g of barium sulphate (molar mass  $233 \text{ g mol}^{-1}$ ). The percentage of sulphur in the compound (X) is \_\_\_\_\_  $\times 10^{-1}$  % (Nearest integer)

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

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- Q.14** 0.53 g of an organic compound (x) when heated with excess of nitric acid (concentrated) and then with silver nitrate gave 0.75 g of silver bromide precipitate. 1.0 g of (x) gave 1.32 g of  $\text{CO}_2$  gas on combustion. The percentage of hydrogen in the compound (x) is \_\_\_\_%. [Nearest Integer]

[Given: Molar mass in  $\text{g mol}^{-1}$  H : 1, C : 12, Br : 80, Ag : 108, O : 16; Compound (x) :  $\text{C}_x\text{H}_y\text{Br}_z$ ]

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

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- Q.15** In Dumas method for estimation of nitrogen, 0.50 g of an organic compound gave 70 mL of nitrogen collected at 300 K and 715 mm pressure. The percentage of nitrogen in the organic compound is \_\_\_\_%.

(Aqueous tension at 300 K is 15 mm).

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

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- Q.16** 0.25 g of an organic compound "A" containing carbon, hydrogen and oxygen was analysed using the combustion method. There was an increase in mass of  $\text{CaCl}_2$  tube and potash tube at the end of the experiment. The amount was found to be 0.15 g and 0.1837 g, respectively. The percentage of oxygen in compound A is \_\_\_\_%. (Nearest integer)  
(Given: molar mass in  $\text{g mol}^{-1}$  H : 1, C : 12, O : 16)

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

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- Q.17** Sodium fusion extract of an organic compound (Y) with  $\text{CHCl}_3$  and chlorine water gives violet color to the  $\text{CHCl}_3$  layer. 0.15 g of (Y) gave 0.12 g of the silver halide precipitate in Carius method. Percentage of halogen in the compound (Y) is \_\_\_\_\_. (Nearest integer)  
(Given : molar mass  $\text{g mol}^{-1}$  C:12, H:1, Cl:35.5, Br:80, I:127)

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

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- Q.18** An organic compound weighing 500 mg, produced 220 mg of  $\text{CO}_2$ , on complete combustion. The percentage composition of carbon in the compound is \_\_\_\_%. (nearest integer)  
(Given molar mass in  $\text{g mol}^{-1}$  of C : 12, O : 16)

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

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- Q.19** In Dumas' method 292 mg of an organic compound released 50 mL of nitrogen gas ( $N_2$ ) at 300 K temperature and 715 mm Hg pressure. The percentage composition of 'N' in the organic compound is \_\_\_\_\_ % (Nearest integer) (Aqueous tension at 300 K = 15 mm Hg)

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

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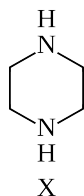
- Q.20** In Dumas' method for estimation of nitrogen 1 g of an organic compound gave 150 mL of nitrogen collected at 300 K temperature and 900 mm Hg pressure. The percentage composition of nitrogen in the compound is \_\_\_\_\_ % (nearest integer) (Aqueous tension at 300 K = 15 mm Hg)

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

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- Q.21** During estimation of nitrogen by Dumas' method of compound X (0.42 g)



\_\_\_\_\_ mL of  $N_2$  gas will be liberated at STP. (nearest integer)

(Given molar mass in  $g\ mol^{-1}$  : C:12, H:1, N:14)

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

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- Q.22** 0.5 g of an organic compound on combustion gave 1.46 g of  $CO_2$  and 0.9 g of  $H_2O$ . The percentage of carbon in the compound is \_\_\_\_\_. (Nearest integer) [Given : Molar mass (in  $g\ mol^{-1}$ ) C:12, H:1, O:16]

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

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- Q.23** In the sulphur estimation, 0.20 g of a pure organic compound gave 0.40 g of barium sulphate. The percentage of sulphur in the compound is \_\_\_\_\_  $\times 10^{-1}\%$ .

(Molar mass : O = 16, S = 32, Ba = 137 in  $g\ mol^{-1}$ )

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

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- Q.24** In Carius method of estimation of halogen, 0.25 g of an organic compound gave 0.15 g of silver bromide (AgBr). The percentage of Bromine in the organic compound is \_\_\_\_\_  $\times 10^{-1}\%$  (Nearest integer). (Given : Molar mass of Ag is 108 and Br is 80  $g\ mol^{-1}$ )

[JEE Main 2025 (Online) 24th January Evening Shift]

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- Q.25** During "S" estimation, 160 mg of an organic compound gives 466 mg of barium sulphate. The percentage of Sulphur in the given compound is \_\_\_\_\_ %.

(Given molar mass in  $g\ mol^{-1}$  of

Ba:137, S:32, O:16)

[JEE Main 2025 (Online) 23rd January Morning Shift]

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- Q.26** In Carius method for estimation of halogens, 180 mg of an organic compound produced 143.5 mg of AgCl. The percentage composition of chlorine in the compound is \_\_\_\_\_. (Given : molar mass in  $g\ mol^{-1}$  of Ag:108, Cl:35.5)

[JEE Main 2025 (Online) 22nd January Morning Shift]

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## ANSWER KEY

### Section A (MCQ) — 10 questions

| Ques. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |
|-------|---|---|---|---|---|---|---|---|---|----|--|
| Ans.  | 1 | 2 | 2 | 3 | 4 | 4 | 2 | 1 | 2 | 1  |  |

### Section B (Numerical) — 16 questions

| Ques. | 11       | 12 | 13  | 14  | 15 |
|-------|----------|----|-----|-----|----|
| Ans.  | 41 or 42 | 5  | 435 | 4   | 15 |
| Ques. | 16       | 17 | 18  | 19  | 20 |
| Ans.  | 73       | 43 | 12  | 18  | 20 |
| Ques. | 21       | 22 | 23  | 24  | 25 |
| Ans.  | 109      | 80 | 275 | 255 | 40 |
| Ques. | 26       |    |     |     |    |
| Ans.  | 20       |    |     |     |    |