

QUICK DRILL · CBSE CLASS 9

Atoms and Molecules

Science · Chapter 3 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE	TOTAL MARKS	DURATION	MARKING	TARGET
	15	20 min	+1 / 0	≥ 12/15

OBJECTIVES

Reinforce the four core topics of Atoms and Molecules via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

INSTRUCTIONS

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

SECTION · QUICK DRILL

Q 1-15 · 20 MIN

Q1. Avogadro's number is:

(A) 6.022×10^{23}

(C) 6.022×10^{24}

PYQ 2020 · Delhi · 1m · 30s

(B) 6.022×10^{22}

(D) 1.602×10^{23}

Q2. The molecular mass of H_2O (H = 1, O = 16) is:

(A) 16 u

(C) 18 u

PYQ 2019 · Delhi · 1m · 30s

(B) 17 u

(D) 20 u

Q3. Which law states that the mass of reactants equals the mass of products in a chemical reaction?

(A) Law of Definite Proportions

(C) Law of Multiple Proportions

PYQ 2021 · All India · 1m · 30s

(B) Avogadro's Law

(D) Law of Conservation of Mass

Q4. How many moles are present in 11 g of CO_2 ? (M = 44 g/mol)

(A) 0.25 mol

(C) 1 mol

PYQ 2022 · Delhi · 1m · 45s

(B) 0.5 mol

(D) 2 mol

Q5. Which of the following is NOT a postulate of Dalton's atomic theory?

(A) Atoms are indivisible

(C) Atoms combine in whole-number ratios

PYQ 2023 · Delhi · 1m · 30s

(B) Atoms contain protons, neutrons and electrons

(D) Atoms of the same element are identical

Q6. The chemical formula of aluminium oxide is:

(A) AlO

(C) Al_2O_3

PYQ 2019 · All India · 1m · 30s

(B) Al_2O

(D) AlO_3

Q7. The mass of 0.5 mole of N_2 gas (atomic mass of N = 14) is:

(A) 7 g

(C) 28 g

PYQ 2024 · Delhi · 1m · 45s

(B) 56 g

(D) 14 g

Q8. Which one of these is a polyatomic ion?

(A) Na^+

(C) SO_4^{2-}

PYQ 2020 · All India · 1m · 30s

(B) Cl^-

(D) O^{2-}

Q9. The number of atoms in 1 molecule of H_2SO_4 is:

(A) 4

(C) 6

PYQ 2022 · All India · 1m · 30s

(B) 5

(D) 7

Q10. 1 mole of any substance contains how many particles?

(A) 6.022×10^{22} particles

(C) 1.602×10^{23} particles

PYQ 2023 · All India · 1m · 30s

(B) 6.022×10^{23} particles

(D) 1.000×10^{24} particles

Q11. Formula unit mass of CaCO_3 (Ca = 40, C = 12, O = 16) is:
(A) 68 u (B) 88 u
(C) 112 u (D) 100 u
PYQ 2021 · Delhi · 1 m · 45s

Q12. The valency of chlorine in NaCl is:
(A) 0 (B) 1
(C) 2 (D) 7
PYQ 2018 · Delhi · 1 m · 30s

Q13. Number of molecules in 9 g of water ($M = 18 \text{ g/mol}$):
(A) 3.011×10^{23} (B) 6.022×10^{23}
(C) 1.505×10^{23} (D) 9.033×10^{23}
PYQ 2024 · All India · 1 m · 60s

Q14. Which is the correct formula of calcium nitrate?
(A) CaNO_3 (B) $\text{Ca}(\text{NO}_3)_2$
(C) Ca_2NO_3 (D) $\text{Ca}_3(\text{NO}_3)_2$
PYQ 2022 · Delhi · 1 m · 30s

Q15. Which is a limitation of Dalton's atomic theory?
(A) Atoms combine in whole-number ratios (B) Mass is conserved in reactions
(C) Atoms of the same element have different masses (D) Compounds have fixed composition (isotopes)
PYQ 2023 · Delhi · 1 m · 30s

ANSWER KEY & EXPLANATIONS

Q 1-15 · MARK YOUR SCORE

Q1. Answer: A
 $N_A = 6.022 \times 10^{23}$ particles per mole — the number of atoms in 12 g of ^{12}C .

Q2. Answer: C
 $2(1) + 16 = 18 \text{ u}$.

Q3. Answer: D
Lavoisier's Law of Conservation of Mass — mass is neither created nor destroyed in a chemical reaction.

Q4. Answer: A
 $n = m/M = 11 / 44 = 0.25 \text{ mol}$.

Q5. Answer: B
Sub-atomic structure (protons, neutrons, electrons) was discovered much later. Dalton thought atoms were indivisible.

Q6. Answer: C
Al has valency 3, O has valency 2. Criss-cross gives Al_2O_3 .

Q7. Answer: D
Molar mass of $\text{N}_2 = 2(14) = 28 \text{ g/mol}$. Mass = $n \times M = 0.5 \times 28 = 14 \text{ g}$.

Q8. Answer: C
Sulphate (SO_4^{2-}) is a polyatomic ion — a group of atoms behaving as one ion.

Q9. Answer: D
 $2 \text{ H} + 1 \text{ S} + 4 \text{ O} = 7 \text{ atoms}$.

Q10. Answer: B
By definition, 1 mole = $N_A = 6.022 \times 10^{23}$ particles.

Q11. Answer: D
 $40 + 12 + 3(16) = 40 + 12 + 48 = 100 \text{ u}$.

Q12. Answer: B
Chlorine has 7 valence electrons; valency = $8 - 7 = 1$. (Valency $\neq$ number of valence electrons.)

Q13. Answer: A
 $n = 9/18 = 0.5 \text{ mol}$; $N = 0.5 \times 6.022 \times 10^{23} = 3.011 \times 10^{23}$ molecules.

Q14. Answer: B
 $\text{Ca}^{2+} + \text{NO}_3^- \rightarrow \text{Ca}(\text{NO}_3)_2$. Polyatomic NO_3 in brackets because subscript > 1 .

Q15. Answer: C

Dalton said atoms of the same element are identical — but ISOTOPES (e.g. ^{12}C , ^{13}C , ^{14}C) have different masses, contradicting that postulate.