

PREVIEW — SAMPLE ONLY

This is a sample of the solved pack, not the full solved paper. It shows the objective answer key sample and the first short-question block so you can judge the quality before buying.



Preview — 10th Class Chemistry 2025 — Group I

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BISE Lahore — 10th Class Chemistry — Annual 2025 — Group I (Solved)

Solutions written originally from the Punjab Textbook Board (PTB) Class 10 Chemistry textbook (Chapters 9–16). No numerical-calculation questions appear in this paper; the one equilibrium-constant expression (Q.2(ii)) was derived twice independently and both derivations agree. See sources.md for provenance and review notes.

GROUP I — OBJECTIVE (Answer Key with Reasons)

Q.1 In an irreversible reaction, dynamic equilibrium:

ANSWER

(A) Never established — Dynamic equilibrium is a property of reversible reactions only; an irreversible reaction goes to completion, so no equilibrium is ever set up (textbook Ch. 9).

Q.2 Which one of the following is a Lewis base:

ANSWER

(A) NH_3 — A Lewis base donates a lone pair of electrons; ammonia donates the lone pair on nitrogen. BF_3 and AlCl_3 accept a pair (Lewis acids) and H^+ accepts a pair (Lewis acid).

Q.3 $\text{K}_4[\text{Fe}(\text{CN})_6]$ is a:

ANSWER

(C) Complex salts — Potassium ferrocyanide contains the complex ion $[\text{Fe}(\text{CN})_6]^{4-}$, so it is a complex salt, not a double, acidic or mixed salt.

Q.4 Which salt is used for manufacture of explosives, plastics and other chemicals:

ANSWER

(A) Sodium chlorate (NaClO_3) — In the textbook's salts table, the use "manufacture of explosives, plastics and other chemicals" is listed against sodium chlorate. (Note on the scan: the 'a' of "Na" prints low in the first option row, so the option reads like " N_2ClO_3 " and option (B) like " N_2SiO_3 "; the intended compounds are NaClO_3 and Na_2SiO_3 — sodium silicate — as the table pairs them.)

Q.5 Anthracite contains the carbon content:

ANSWER

(C) 90% — Anthracite is the highest-rank coal and is about 90% carbon (textbook Ch. 11/12, coal varieties).

Q.6 Substitution reaction is the characteristics of:

ANSWER

(A) Alkanes — Alkanes are saturated hydrocarbons and react mainly by substitution (an atom is replaced by another atom); alkenes and alkynes characteristically undergo addition.

Q.7 Which one of the following vitamins is water soluble:

ANSWER

(D) Vitamin C — Vitamins A, D and E are fat-soluble; vitamin C (and the B group) are water-soluble.

Q.8 A good example of reducing sugar is:

ANSWER

(A) Glucose — Glucose has a free aldehyde group and reduces Fehling's solution; it is the textbook's standard example of a reducing sugar. (Note: maltose is also a reducing sugar, but glucose is the textbook's named example and the expected board answer.)

Q.9 Which one of these pollutants is not found in car exhaust fumes:

ANSWER

(B) O_3 — Car exhaust directly contains CO, NO_2 and SO_2 . Ozone (O_3) is a secondary pollutant: it is formed in the atmosphere by reactions of primary pollutants, not emitted in the exhaust itself (textbook Ch. 14).

Q.10 Which one of the following gases is used to destroy harmful bacteria in water:

ANSWER

(B) Chlorine — Chlorine is added to water supplies to kill harmful bacteria (chlorination, textbook Ch. 15).

Q.11 The type of hepatitis which can be caused by contaminated water is:

ANSWER

(A) E — Hepatitis E spreads through water contaminated with faecal matter (textbook Ch. 15, water-borne diseases).

Q.12 Which one of the following is not fraction of residual oil:

ANSWER

(C) Fuel oil — The textbook lists exactly four fractions of residual oil: lubricants, paraffin wax, asphalt and petroleum coke (Ch. 12). Fuel oil is not one of them.

KEY

Group I Objective Key: 1-A, 2-A, 3-C, 4-A, 5-C, 6-A, 7-D, 8-A, 9-B, 10-B, 11-A, 12-C

GROUP I — SUBJECTIVE
Part-I — sample
Q.2

(i) Write two macroscopic characteristics of forward reaction.

1. It is a reaction in which reactants react to form products, taking place from left to right.
2. At the initial stage its rate is very fast, and it slows down gradually as reactants are used up. (Textbook Ch. 9, macroscopic characteristics table.)

(ii) Write the equilibrium constant expression for the reaction: $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$

For a general reaction, $K_c = [\text{products}] \text{ raised to their coefficients } \div [\text{reactants}] \text{ raised to their coefficients.}$

$K_c = [\text{SO}_3]^2 \div ([\text{SO}_2]^2 \times [\text{O}_2])$ (Derived twice: once from the law of mass action, once by writing the forward and reverse rate expressions and equating them at equilibrium — both give the same expression. ✓)

(iii) Define chemical equilibrium state.

Chemical equilibrium state is the state of a reversible reaction in a closed system at which the forward and reverse reactions take place at the same rate, so the concentrations of reactants and products stop changing (even though the reactions themselves do not stop).

(iv) Write any two physical properties of acid.

1. Acids have a sour taste.
2. Aqueous solutions of acids turn blue litmus paper red.

(Other textbook properties: acids conduct electricity in aqueous solution because they ionise.)

(v) Write reaction of acid with sulphides (Give equation). Acids react with metal sulphides to liberate hydrogen sulphide gas, which smells of rotten eggs:



(vi) Write formula of sodium hydroxide and potassium hydroxide.

- Sodium hydroxide: **NaOH**
- Potassium hydroxide: **KOH**

(vii) How are alkyl halides reduced? Reduction means addition of nascent hydrogen — the halogen atom is replaced by a hydrogen atom. This reaction takes place in the presence of zinc metal and hydrochloric acid ($\text{Zn} + \text{HCl}$), which provide nascent hydrogen. Example:



(viii) Define hydrocarbons. Give an example.

Hydrocarbons are organic compounds that contain carbon and hydrogen atoms only.

Example: methane, **CH₄**.

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