Summative Assessment – Term II 2025-26
Model Question Paper 2 – CHEMISTRY
Class : X Score : 40 Time : 1½ Hours

1-mark questions (4 × 1 = 4)

1. p
2. A. (a)–(ii) (b)–(i) (c)–(iii)
3. Pure copper
4. A. Both correct, II explains I

2-mark questions (7 × 2 = 14)

5. a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$ b) Group 17, Period 3

   OR Configuration:
   $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^2$
   Exception: Actual – $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5\ 4s^1$
   Reason: Half-filled d-subshell ($3d^5$) is more stable

6. 11.2 L at STP = 0.5 mole → Molar mass = 16 / 0.5 = 32 g mol^{-1} Gas = Oxygen (O_2)OR T = 300 K, P = 2 atm, V = 5 L At STP: P = 1 atm, T = 273 K V_2 = (2 × 5 × 273) / (1 × 300) = 9.1 L

7.

Electrolyte	Product at Cathode	Product at Anode
Aqueous $CuSO_4$ (Cu electrodes)	Copper	Oxygen
Acidified water	Hydrogen	Oxygen

9. OR Graphite is inert, does not react with molten alumina or oxygen produced at anode. Metal would react and contaminate aluminium.
10. A → Reduction / Smelting B → Leaching / Bayer's process C → Magnetic separation (for haematite) OR a) Homogeneous mixture of two or more metals / metal + non-metal. Example: Brass (Cu + Zn) b) High strength-to-weight ratio / corrosion resistant
11. Any two: Painting, oiling/greasing, electroplating, alloying, anodising, tin plating, enamel coating

3-mark questions (6 × 3 = 18)

12. a) N shell b) 16 orbitals ($n^2 = 16$) c) Subshells: 4s (2e), 4p (6e), 4d (10e), 4f (14e) → Total 32 electrons

    OR a) 4s b) 1 electron c) s-block

13. a) $N_2 + 3H_2 \rightarrow 2NH_3$
    b) Volume of $NH_3 = 2 \times 5.6$ L = 11.2 L
    c) Gay-Lussac's law of combining volumesOR a) 16 g O_2 = 0.5 mole b) $0.5 \times 6.022 \times 10^{23} = 3.011 \times 10^{23}$ molecules c) 11.2 L

14. a) Sodium (Na) or Potassium (K)
    b) Magnesium (Mg) – more reactive than iron, acts as sacrificial anode
    c) No – Copper is below zinc in reactivity series, less reactive

15. a) Hydrated ferric oxide → $Fe_2O_3 \cdot xH_2O$
    b) Coating aluminium with a thick layer of Al_2O_3 by electrolysis
    c) Tin reacts with food acids → toxic compounds formed

16. a) Molten alumina (Al_2O_3) dissolved in cryolite (Na_3AlF_6)
    b) Cathode: $Al^{3+} + 3e^- \rightarrow Al$ Anode: $2O^{2-} \rightarrow O_2 + 4e^-$
    c) To lower the melting point of alumina / increase conductivity

17. a) Sulphide ores (e.g., zinc blende, galena)
    b) Collectors: Pine oil / xanthates; Frothers: Sodium ethyl xanthate c) Collectors adsorb on ore particles making them water-repellent (hydrophobic)

    4-mark question (1 × 4 = 4)

18. (A) Any FOUR a) Cu^+: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}$ – fully filled d-subshell is more stable
    b) 8.4 L = 0.375 mole → M = 14 / 0.375 = 37.33 ≈ 38 g/mol (approx. HCl or Ar)
    c) CO reduces Fe_2O_3 to Fe and itself gets oxidised to CO_2 / strong reducing agent at high temperature
    d) Molten waste material; $CaSiO_3$ formed by reaction of SiO_2 impurity with CaO (limestone)
    e) Utensils, surgical instruments, automobile parts, etc.
    f) Good conductor of electricity and lightweight

    OR (B)

    a) Volume doubles (600/300 = 2 times)
    b) Charles' law
    c) (i) $C_2H_2 + 2.5\ O_2 \rightarrow 2CO_2 + H_2O(g)$ (or balanced as $C_2H_2 + 5/2\ O_2 \rightarrow 2CO_2 + H_2O$)
    (ii) Gas = Acetylene (Ethyne); Gay-Lussac's law