

Sample Paper
Class – XII
Subject – Chemistry

Time: Three Hours Max. Marks: 70

General Instructions

1. All questions are compulsory.
2. Question nos. 1 to 8 are very short answer questions and carry 1 mark each.
3. Question nos. 9 to 18 are short answer questions and carry 2 marks each.
4. Question nos. 19 to 27 are also short answer questions and carry 3 marks each.
5. Question nos. 28 to 30 are long answer questions and carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

Network of Education

1. What type of bonding helps in stabilizing the α -helix structure of proteins.
2. In the ring test for identification of nitrate ion, what is the formula of the compound responsible for the brown ring formed at the interface of two liquids?
3. Give the structure of : 5-Oxohexanoic acid
4. A reaction is first order in A and second order in B. How is the rate affected when the concentration of both A and B is doubled
5. A group 14 element is to be converted into n type semi conductor by doping it with suitable impurity .To which group should this impurity belong?
6. Give the IUPAC name of $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$.
7. A reaction is first order in A and second order in B. How is the rate affected when concentration of B is tripled?
8. Name the non-stoichiometric defect responsible for colour in alkali halides.
9. Give example for following name reaction:
 - i. Reimer-Tiemann reaction
 - ii. Kolbe's reaction
10. Write the mechanism of nucleophilic addition reaction in aldehydes.
11. Give one chemical test to distinguish:
 - i. Acetaldehyde and Benzaldehyde
 - ii. Benzophenone and Acetophenone
12. (a) Fluorine exhibit oxidation state of 1 only whereas other halogens exhibit +1, +3, +5, +7 oxidation states also. .why
(b) Fluorine forms only one oxoacid, HOF
13. Accomplish the following conversions:
 - (a) Nitrobenzene to phenol
 - (b) Methanamine to Ethanamine
14. (a) How is nitric acid obtained on large scale by Ostwald process?
(b) All the bonds in the molecules of PCl_5 are not equal. Why

OR

(a) H₂S is less acidic than H₂O.

(b) H₂O is a liquid and H₂S is a gas.

(a) Name the catalyst and the promoter used in Haber's process for

15. Manufacture of ammonia.

(b) Why is ferric chloride preferred over potassium chloride in case of a cut leading to bleeding?

16. Explain the Electrophoresis with diagrams.

17. How do you account for molar conductivity of strong and weak electrolyte with concentration? Plot the graphs also.

18. Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125 pm.

(a) what is the length of the side of the unit cell.

(b) How many unit cells are there in 1 cm³ of aluminium

19. Explain the following terms with suitable examples: (a) Cationic detergents (b) Anionic detergents (c) non-ionic detergents

20. Write the structure of monomer & uses each of BunaN, Teflon, Bakelite.

(a) Name the deficiency diseases caused due to lack of vitamin B₆.

(b) Write the reactions when D-Glucose reacts with following: (i) HI (ii) ConcHNO₃

21. (a) Aldehydes are more reactive than Ketones towards Nucleophilic addition reaction

(b) There are two NH₂ group in semi carbazide however only one is involved in the formation of semi carbazones.

(c) During the preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester should be removed as fast as it is formed.

22. (a) Using IUPAC norms write the formulae for Dichlorido bis (ethane-1, 2-diamine) cobalt (III)

(b) Draw all the structures of optical isomers of [CrCl(en)₂(NH₃)₂]²⁺

(c) Draw diagram to show splitting of d orbital in octahedral crystal field

23. (a) Does the hydrolysis of XeF₆ lead to a redox reaction?

(b) Write the balanced equations involved in the preparation of PH₃.

24. (a) What is the role of depressant in froth flotation method?
(b) Giving chemical equations explain how leaching is used in metallurgy of silver.
25. (a) Write short notes on the following: Order of reaction & Molecularity
(b) The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.
26. (a) Conductivity of 0.00241M acetic acid is $7.896 \times 10^{-6} \text{ S cm}^{-1}$. Calculate its molar conductivity. If λ° for acetic acid is $390.5 \text{ S cm}^2 \text{ mol}^{-1}$. What is its dissociation constant?
(b) When a current of 0.75A is passed through a CuSO_4 solution for 25 min, 0.369g of copper is deposited at the Cathode. Calculate the atomic mass of copper.
27. (a). What problem arises in using alitame as artificial sweetener?
(b) Sleeping pills are recommended by doctors to the patients suffering from sleeplessness but it is not advisable to take its doses without consultation with doctor. Why?
28. (a) Primary alkyl halide $\text{C}_4\text{H}_9\text{Br}$ (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives Compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.
2. (b) An organic compound A with molecular formula $\text{C}_5\text{H}_5\text{O}$. It does not reduce Tollen's or Fehling's reagent but forms a bisulphite compound. It also gives iodoform tests. Identify A

OR

29. (a) An organic compound A with molecular formula $\text{C}_5\text{H}_8\text{O}_2$ is reduced to n-pentane on treatment with Zn-Hg/HCl. A forms a dioxime with hydroxylamine and gives a positive iodoform test and Tollen's test. Identify the compound A and deduce its structure.
(b) An aromatic compound A on treatment with aqueous ammonia and heating forms compound B which on heating with Br_2 and KOH forms a compound C of molecular formula $\text{C}_6\text{H}_7\text{N}$. Write the structures and IUPAC names of compounds A, B, C.
- a) Describe How Potassium dichromate is made from Chromite ore. Give the equations for the Chemical reactions involved.
- (b) Write balanced ionic equations for reacting ions to represent the action of acidified Potassium dichromate solution on:

(i) Potassium iodide solution [ii] iron (II) solution [iii] H₂S

(c) The chromates and dichromates are interconvertible in aqueous solution depending upon pH of the solution.

OR

Account for the following:

1. Zn, Cd and Hg are not considered as transition elements.
2. Scandium is a transition element but Zinc is not.
3. Silver atom has completely filled d orbital (4d¹⁰) in its ground state, yet it is transition element
4. Transition metals have high melting and boiling points.
5. Transition elements exhibit higher enthalpies of atomization

30. (a) Out of 1M solution of Sugar and 1 M solution of Urea, which will have greater boiling point? Why.

(b) A solution containing 2.56 gm of sulphur in 100 g of carbon disulphide gave a freezing point lowering of 0.383 K. Calculate the molecular formulae of Sulphur [k_f of carbon disulphide = 3.83 K kg/mol Atomic mass of S =32 amu]

(c) What is reverse osmosis? Give its application.