CBSE EXAMINATION PAPER-2026

CHEMISTRY

(Solved)

Time allowed : 3 hours | Maximum Marks : 82

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **41 questions.** All questions are **compulsory.**

ii. This question paper is divided into **5 sections.**

iii. **Section A** – questions number **1 to 5** are case based questions

iv. **Section B** – questions number **6 to 21** are multiple choice questions

v. **Section C** – questions number **22 to 27** are very short answer

vi. **Section D** – questions number **28 to 35** are short answer

vii. **Section E** – questions number **36 to 41** are long answer

viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

ix. Use of calculator is NOT allowed.

Section A

Question 1. Living systems are made up of various complex biomolecules like carbohydrates, proteins, nucleic acids, lipids, etc. Proteins and carbohydrates are essential constituents of our food. In addition, some simple molecules like vitamins and mineral salts also play an important role in the functions of organisms. All proteins are polymers of α-amino acids. Proteins can be classified into two types on the basis of their molecular shape — Fibrous and Globular proteins. Vitamins are accessory food factors required in the diet. They are classified as fat-soluble and water-soluble. Deficiency of vitamins leads to many diseases. Nucleic acids are the polymers of nucleotides which in turn consist

of a base, a pentose sugar and phosphate moiety. There are two types of nucleic acids — DNA and RNA. Nucleic acids are responsible for the transfer of characters from parents to offsprings.

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> **(1) Write the name of basic building units of proteins and nucleic acids. How can you differentiate between Fibrous and Globular proteins on the basis of their structures ?**
>
> [2 Marks]

> **(2) What products would be formed when a nucleotide from DNA containing thymine is hydrolyzed ?**
>
> [2 Marks]

Question 3. Living systems are made up of various complex biomolecules like carbohydrates, proteins, nucleic acids, lipids, etc. Proteins and carbohydrates are essential constituents of our food. In addition, some simple molecules like vitamins and mineral salts also play an important role in the functions of organisms. All proteins are polymers of α - amino acids. Proteins can be classified into two types on the basis of their molecular shape — Fibrous and Globular proteins. Vitamins are accessory food factors required in the diet. They are classified as fat-soluble and water-soluble. Deficiency of vitamins leads to many diseases. Nucleic acids are the polymers of nucleotides which in turn consist of a base, a pentose sugar and phosphate moiety. There are two types of nucleic acids — DNA and RNA. Nucleic acids are responsible for the transfer of characters from parents to offsprings.

> **(1) Give one example each of a fat-soluble vitamin and a water-soluble vitamin.**
>
> [2 Marks]

(2) Write one structural difference between DNA and RNA.

[2 Marks]

Question 4. Alcohols have higher boiling points than other compounds, namely hydrocarbons, ethers and haloalkanes of comparable molecular masses. On oxidation, primary alcohols yield aldehydes with mild oxidizing agents and carboxylic acids with strong oxidizing agents. Secondary alcohols yield ketones on oxidation while tertiary alcohols are resistant to oxidation. Ethers may be prepared by dehydration of alcohols and Williamson synthesis. The C − O bond in ethers can be cleaved by hydrogen halides. The presence of − OH group in phenols activates the aromatic ring towards electrophilic substitution and directs the incoming group to ortho and para positions due to resonance effect. In presence of NaOH, phenol generates phenoxide ion which is even more reactive than phenol. Thus, in alkaline medium, phenol undergoes Kolbe's reaction.

(1) Write the reaction involved in Kolbe's reaction.

[2 Marks]

(2) Name the reagents used in the following reactions : (i) Oxidation of a primary alcohol to aldehyde (ii) Oxidation of a primary alcohol to carboxylic acid

[2 Marks]

Question 5. Alcohols have higher boiling points than other compounds, namely hydrocarbons, ethers and haloalkanes of comparable molecular masses. On oxidation, primary alcohols yield aldehydes with mild oxidizing agents and carboxylic acids with strong oxidizing agents. Secondary alcohols yield ketones on oxidation while tertiary alcohols are resistant to oxidation. Ethers may be prepared by dehydration of alcohols and Williamson synthesis. The C − O bond in ethers can be cleaved by hydrogen halides. The presence of − OH group in phenols activates the aromatic ring towards electrophilic substitution and directs the incoming group to ortho and para positions due to resonance effect. In presence of NaOH, phenol generates phenoxide ion which is even more reactive than phenol. Thus, in alkaline medium, phenol undergoes Kolbe's reaction.

(1) Write the products of the following reaction :

$$(CH_3)_3\,C - O - C_2H_5 \xrightarrow{HI}$$

[2 Marks]

(2) Why are tertiary alcohols resistant to oxidation ?

[2 Marks]

Section B

Question 6.

The intermediate formed during the slowest step involved in the dehydration of alcohol is :

[1 Marks]

(A) free radical

(B) carbocation

(C) protonated alcohol

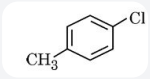
(D) carbanion

Question 7.

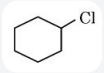
Which of the following will be the least reactive towards nucleophilic substitution reaction ?

[1 Marks]

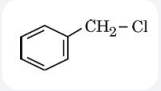
(A)



(B)



(C)



(D) $CH_3 – Cl$

Question 8. The oxidation number of Co in $[Co(en)_3]_2(SO_4)_3$ is :

[1 Marks]

(A) + 3

(B) + 2

(C) + 6

(D) + 4

Question 9.

According to Werner's theory, the primary valencies of the central metal atom :

[1 Marks]

(A) are satisfied by negative ions.

(B) are non-ionisable.

(C) are equal to its coordination number.

(D) are satisfied by neutral molecules or negative ions

Question 10.

Which of the following reagent is used to distinguish between $(C_2H_5)_2NH$ and $(C_2H_5)_3N$?

[1 Marks]

(A) Conc. HCl + $ZnCl_2$

(B) $CHCl_3$ + KOH

(C) $C_6H_5SO_2Cl$

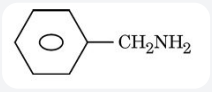
(D) NaOH + I_2

Question 11.

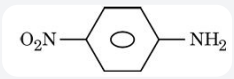
Among the following, which is the strongest base ?

[1 Marks]

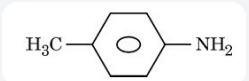
(A)



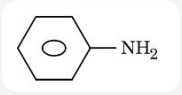
(B)



(C)



(D)



Question 12.

In aqueous solution, $Cr_2O_7^{2-}$ ion converts to which of the following in alkaline medium ?

[1 Marks]

(A) CrO_3

(B) Cr^{3+}

(C) CrO_4^{2-}

(D) CrO

Question 13. The boiling point of an azeotropic mixture of water and ethanol is less than that of pure water and ethanol. The mixture shows :

[1 Marks]

(A) positive deviation from Raoult's Law.

(B) negative deviation from Raoult's Law.

(C) no deviation from Raoult's Law.

(D) that the solution is an ideal solution.

Question 14.

The mole fraction of a solute in 2·0 molal aqueous solution is :

[1 Marks]

(A) 0·00347

(B) 0·347

(C) 1·87

(D) 0·0347

Question 15.

On electrolysis of very dilute aqueous solution of NaCl using platinum electrodes :

[1 Marks]

(A) H_2 gas is evolved at cathode.

(B) O_2 gas is evolved at anode.

(C) H_2 gas is evolved at anode.

(D) Na is produced at cathode.

Question 16.

For a reaction 3A → 2B, the rate of reaction +d[B]/ dt is equal to :

[1 Marks]

(A) -1/3d[A]/dt

(B) +2d[A]/dt

(C) -3/2d[A]/dt

(D) -2/3d[A]/dt

Question 17.

On hydrolysis, which of the following carbohydrates gives only glucose ?

[1 Marks]

(A) Lactose

(B) Maltose

(C) Galactose

(D) Sucrose

Question 18.

Assertion (A) : Separation of Zr and Hf is difficult. Reason (R) : Because Zr and Hf lie in the same group of the periodic table.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

Question 19.

Assertion (A) : Phenol is less acidic than 4-methylphenol. Reason (R) : The presence of an electron releasing group in phenol makes it less acidic.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

Question 20.

Assertion (A) : Aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis. Reason (R) : Gabriel phthalimide synthesis is used for the preparation of primary aliphatic amines.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(C) Assertion (A) is false, but Reason (R) is true.

(D) Assertion (A) is true, but Reason (R) is false.

Question 21.

Assertion (A) : Order of reaction is applicable to elementary as well as complex reactions. Reason (R) : Order of a reaction is an experimental quantity.

[1 Marks]

(A) Assertion (A) is false, but Reason (R) is true.

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(C) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Section C

Question 22.

For the compound having molecular formula C_4H_9Br, write : (a) the isomer which is most reactive towards S_N1 displacement. (b) the isomer which, on reacting with Na metal in the presence of dry ether, gives 2,5-Dimethylhexane.

[2 Marks]

Question 23.

For a reaction A + B → Products, the rate law is :

Rate = $k[A][B]^{3/2}$

Write the overall order of the reaction. Can this reaction be an elementary reaction ? Give reason in support of your answer.

[2 Marks]

Question 24.

Explain why, on addition of 1 mol of KCl to 1 litre of water, the boiling point of water increases, while the addition of 1 mol of methyl alcohol to 1 litre of water decreases the boiling point.

[2 Marks]

Question 25.

Write IUPAC names of the following compounds :

(i) $[PtCl_2(en)_2]SO_4$

(ii) $(NH_4)_2[CoF_4]$

[2 Marks]

Question 26.

Define the following terms with a suitable example in each case :

(i) Ambidentate ligand

(ii) Double salt

[2 Marks]

Question 27.

How do you explain the following ?

(a) Presence of a straight chain in glucose

(b) Presence of five − OH groups in glucose which are attached to different carbon atoms

[2 Marks]

Section D

Question 28.

The half-life period of a radioactive element is $1{\cdot}5 \times 10^{10}$ years. Calculate the time in which the activity of the element is reduced to 75% of its original value.

[Given : log 2 = 0·30, log 3 = 0·48, log 4 = 0·60]

[3 Marks]

Question 29.

State Kohlrausch's law of independent migration of ions. With the help of a curve, explain why it is not easy to determine Λ°_m for weak electrolytes by extrapolating the concentration − molar conductivity curve, as it is for strong electrolytes.

[3 Marks]

Question 30.

An antifreeze solution is prepared by dissolving 31 g of ethylene glycol (Molar mass = 62 g mol^{-1}) in 600 g of water. Calculate the freezing point of the solution. (K_f for water = 1·86 K kg mol^{-1}

[3 Marks]

Question 31.

Answer the following questions about the complexes

$[NiCl_4]^{2-}$ and $[Ni(CN)_4]^{2-}$

(i) Write the hybridization involved in each case.

(ii) Which of them is the inner orbital complex and which one is the outer orbital complex ?

(iii) Compare their magnetic behaviour. [Atomic number : Ni = 28]

[3 Marks]

Question 32.

(i) Name two coordination compounds which are important in biological systems.

(ii) What is meant by chelate effect ? Give an example.

(iii) Why are low spin tetrahedral complexes rarely formed ?

[3 Marks]

Question 33.

Give reasons for the following :

(a) Although chlorine is an electron-withdrawing group, yet it is ortho-, para-directing in electrophilic aromatic substitution reactions.

(b) Aryl halides cannot be prepared by reacting phenol with concentrated halogen acids or phosphorus halides.

(c) Chloroform is stored in closed dark coloured bottles.

[3 Marks]

Question 34.

How will you obtain the following from benzenediazonium chloride ? Give chemical equations involved :

(a) Chlorobenzene

(b) Benzene

(c) Benzonitrile

[3 Marks]

Question 35.

An organic compound (A) with molecular formula C_3H_5N on reaction with C_6H_5MgBr followed by hydrolysis, gives a compound (B). Compound (B) forms an orange-red precipitate with 2,4-DNP reagent and does not give iodoform test. It neither reduces Tollens' or Fehling's reagent nor does it decolourise bromine water. On drastic oxidation with chromic acid it gives a carboxylic acid (C) having molecular formula $C_7H_6O_2$. Identify the compounds (A), (B) and (C). Write the reactions of compound (A) with C_6H_5MgBr followed by hydrolysis to give compound (B).

[3 Marks]

Section E

Question 36.

(i) Describe giving reason which one of the following pairs has the property indicated :

(I) Fe or Cu − higher melting point

(II) Ti^{3+} or Sc^{3+} − coloured in aqueous solution

(III) Cr or Zn^- higher third ionisation enthalpy

(ii) Write the ionic equations for the oxidizing action of – MnO^-_4 in acidic medium with :

(I) Fe^{2+} ion

(II) I^- ion

[5 Marks]

Question 37.

(i) A black-brown coloured solid (A) when fused with KOH in the presence of air, produces a dark green coloured compound (B) which on electrolytic oxidation in alkaline medium gives a dark purple coloured compound (C). Identify (A), (B) and (C). Write the reactions involved.

(ii) What happens when an acidic solution of the green compound (B) is allowed to stand for some time ? Also write the equation involved. What is this type of reaction called ?

[5 Marks]

Question 38.

Write the product(s) when :

(I) One mol of ethanal is treated with 1 mol of CH3OH in the presence of dry HCl gas. (II) Benzaldehyde is treated with conc. NaOH. (III) Ethanoic acid is heated in the presence of P_2O_5.

(ii) Write a simple chemical test to distinguish between Ethanal and Propanal.

(iii) Write the name of the reagent to transform Allyl alcohol to Propenal.

[5 Marks]

Question 39.

(i) Draw the structure of the semi carbazone of acetone

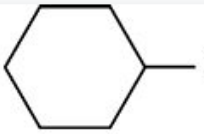
(ii) Why areα-hydrogen atoms of aldehydes and ketones acidic in nature ?

(iii) Arrange the following compounds in increasing order of their reactivity towards HCN

CH_3COCH_3, CH_3CHO, $(CH_3)_3C - C = O - CH_3$

(iv) Write the reaction involved in Etard reaction

[5 Marks]

(v) Write the product when  reacts with Zn(Hg)/conc. HCl.

Question 40.

Calculate the electrode potential of a half-cell for zinc electrode dipping in 0·01 M $ZnSO_4$ solution at 25°C. Given : $E°_{Zn^{2+}/Zn} = -0·76$ V [log 10 = 1]

(ii) Write anode, cathode and overall reaction involved in dry cell

(iii) Equilibrium constant (K_c) is related to $E°_{cell}$ but not to E_{cell}. Why ?

[5 Marks]

Question 41.

(i) The conductivity of 0·001 M solution of acetic acid is $3·905 \times 10^{-5}$ S cm^{-1}. Calculate its molar conductivity and degree of dissociation (α). Given : $\lambda°_{CH_3COO^-} = 40·9$ S cm^2mol^{-1}.

$\lambda°_{H^+} = 349.6$S cm^2mol^{-1}.

(ii) Give reasons for the following : (I) Why does a mercury cell deliver a constant voltage for its entire life ? (II) Why is it necessary to use salt bridge in a galvanic cell ?

[5 Marks]