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 **39 questions.** All questions are **compulsory.**

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

iii. **Section A** – questions number **1 to 3** are case based questions

iv. **Section B** – questions number **4 to 19** are multiple choice questions

v. **Section C** – questions number **20 to 25** are very short answer

vi. **Section D** – questions number **26 to 33** are short answer

vii. **Section E** – questions number **34 to 39** 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. Alcohols and Phenols are acidic in nature. Electron withdrawing groups in phenol increase its acidic strength and electron releasing groups decrease it. Alcohols undergo nucleophilic substitution with hydrogen halides to yield alkyl halides. Dehydration of alcohols gives alkenes. On oxidation, primary alcohols yield aldehydes with mild oxidising agents and carboxylic acids with strong oxidising agents, while secondary alcohols yield ketones. Tertiary alcohols are resistant to oxidation. 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.

Question 2. Alcohols and Phenols are acidic in nature. Electron withdrawing groups in phenol increase its acidic strength and electron releasing groups decrease it. Alcohols undergo nucleophilic substitution with hydrogen halides to yield alkyl halides. Dehydration of alcohols gives alkenes. On oxidation, primary alcohols yield aldehydes with mild oxidising agents and carboxylic acids with strong oxidising agents, while secondary alcohols yield ketones. Tertiary alcohols are resistant to oxidation. 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.

(1) Write the mechanism of acid dehydration of ethanol to yield ethene.

[1 Marks]

(2) Why are tertiary alcohols resistant to oxidation ?

[1 Marks]

(3) Why is ortho-nitrophenol more acidic than ortho-methoxyphenol ?

[1 Marks]

(4) Write the structure of the major product expected from the dinitration of 3-methylphenol.

[1 Marks]

Question 3. Carbohydrates are optically active polyhydroxy aldehydes or ketones or the compounds which produce such units on hydrolysis. They have been broadly classified into three groups — monosaccharides, oligosaccharides and polysaccharides. The carbohydrates may also be classified as either reducing or non-reducing sugars. An important monosaccharide glucose is an aldohexose and is correctly named as D(+)–glucose. It was assigned the open structure on the basis of its reactions with HI, NH_2OH, Br_2 water, $(CH_3CO)_2O$ and nitric acid. Despite having the – CHO group, glucose does not give Schiff's test and hydrogen sulphite addition product with $NaHSO_3$. It was found that glucose forms a six-membered ring in which one of the – OH groups add to the – CHO group and form a cyclic hemiacetal structure.

(1) How do you explain the following ? (i) Presence of a carbonyl group in glucose (ii) Presence of five – OH groups in glucose which are attached to different carbon atoms.

[1 Marks]

(2) What type of carbohydrates are called reducing sugars ?

[1 Marks]

(3) Draw the six-membered ring structure of α–D(+)–glucose.

[1 Marks]

(4) In D(+)–glucose, what do the letter 'D' and sign '(+)' represent ?

[1 Marks]

Section B

Question 4.

Oxidation of chloroform by air in the presence of sunlight produces a poisonous gas known as :

[1 Marks]

(A) Tear gas

(B) Mustard gas

(C) Phosgene gas

(D) Chlorine gas

Question 5.

Lucas reagent produces cloudiness immediately with :

[1 Marks]

(A) 2-methyl-1-propanol

(B) Butan-2-ol

(C) Butan-1-ol

(D) 2-methyl-2-propanol

Question 6.

Which of the following d-orbitals experience more repulsion in the crystal field splitting of octahedral complex ?

[1 Marks]

(A) d_xy , d_yz , d_xz

(B) $d_{x^2 - y^2}$, d_{z^2}

(C) d_xy , $d_{x^2 - y^2}$

(D) d_xz , d_{z^2}

Question 7.

The chelating ligand used for the treatment of lead poisoning is :

[1 Marks]

(A) EDTA

(B) Oxalate ion

(C) Dimethylglyoxime

(D) Ethane-1,2-diamine

Question 8. Manganate ion is paramagnetic due to the presence of :

[1 Marks]

(A) two unpaired electrons

(B) three unpaired electrons

(C) one unpaired electron

(D) fully paired electrons

Question 9.

The correct order of decreasing basicities of $C_2H_5NH_2$, $(C_2H_5)_2NH$ and $(C_2H_5)_3N$ in aqueous solution is :

[1 Marks]

(A) $(C_2H_5)_2NH > C_2H_5NH_2 > (C_2H_5)_3N$

(B) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2$

(C) $C_2H_5NH_2 > (C_2H_5)_2NH > (C_2H_5)_3N$

(D) $(C_2H_5)_3N > C_2H_5)_2NH > C_2H_5NH_2$

Question 10.

The boiling point of one molal NaCl solution, assuming NaCl to be completely dissociated in water is : (K_b for water = 0·52 K kg mol^{-1})

[1 Marks]

(A) 100·04ºC

(B) 100·52ºC

(C) 101·52ºC

(D) 101·04ºC

Question 11.

When a liquid and its vapour are at equilibrium and the pressure is suddenly decreased :

[1 Marks]

(A) equilibrium remains unaffected

(B) cooling occurs

(C) heating occurs

(D) vapour pressure of the solution increases

Question 12. Consider the following cell at 298 K : Mg (s) | Mg^{2+} (1·0 M) || Cu^{2+} (1·0 M) | Cu (s) How can we increase the emf of the cell using the same substances ?

[1 Marks]

(A) By decreasing only the $[Mg^{2+}]$ to 0·1 M

(B) By increasing both $[Mg^{2+}]$ and $[Cu^{2+}]$ to 2·0 M

(C) By increasing only the $[Mg^{2+}]$ to 2·0 M

(D) By decreasing only the $[Cu^{2+}]$ to 0·1 M

Question 13.

Nucleic acids are polymers of :

[1 Marks]

(A) amino acids

(B) nucleotides

(C) pentose sugar

(D) nucleosides

Question 14.

The rate of a first order reaction is $5{\cdot}6 \times 10^{-4}$ mol L^{-1} s^{-1}, when the concentration of reactant is 0·2 mol L^{-1} The rate constant 'k' is :

[1 Marks]

(A) $5{\cdot}6 \times 10^{-3}$ s^{-1},

(B) $2{\cdot}8 \times 10^{-4}$ s^{-1},

(C) $2{\cdot}8 \times 10^{-3}$ s^{-1}

(D) $2{\cdot}8 \times 10^{-5}$ s^{-1},

Question 15.

In the reaction of NaOBr with amide, the carbonyl carbon is lost as :

[1 Marks]

(A) HCO_3^-

(B) CO^{2-}_3

(C) CO_2

(D) CO

Question 16. Assertion (A) : Alcohols act as Bronsted bases as well as Bronsted acids. Reason (R) : It is due to the presence of unshared electron pairs on oxygen atom and presence of polar O – H bond.

[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 17.

Assertion (A) : Diazonium salts of aromatic amines are more stable than those of aliphatic amines. Reason (R) : Diazonium salts of aliphatic amines undergo resonance.

[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.

Question 18.

Assertion (A) : For complex reaction, order of reaction is given by the slowest step. Reason (R) : Order of a reaction is an experimental quantity.

[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 19.

Assertion (A) : E ° _Sc^{3+} / Sc^{2+} E has low value. Reason (R) : Because of the stability of Sc^{3+} ion which has a noble gas configuration.

[1 Marks]

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

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

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

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

Section C

Question 20.

(a) Reactions of which order will show the rate to be independent of the concentration of the reactant ? Give one example of this order.

(b) State the condition under which a bimolecular reaction may be kinetically a first order reaction.

[2 Marks]

Question 21.

(a) Explain the following with the help of Henry's law :

(i) Bends

(ii) Anoxia

[2 Marks]

Question 22.

How does sprinkling of salt help in clearing the snow covered roads in hilly areas ? Write the name of the colligative property involved in this process.

[2 Marks]

Question 23.

Write IUPAC names of the following compounds :

(a) $[Cr(NH_3)_4\ (ONO)Cl]\ NO_3$

(b) $Na[Ag(CN)_2]$

[2 Marks]

Question 24.

What are the hydrolysis products of the following ?

(a) Lactose

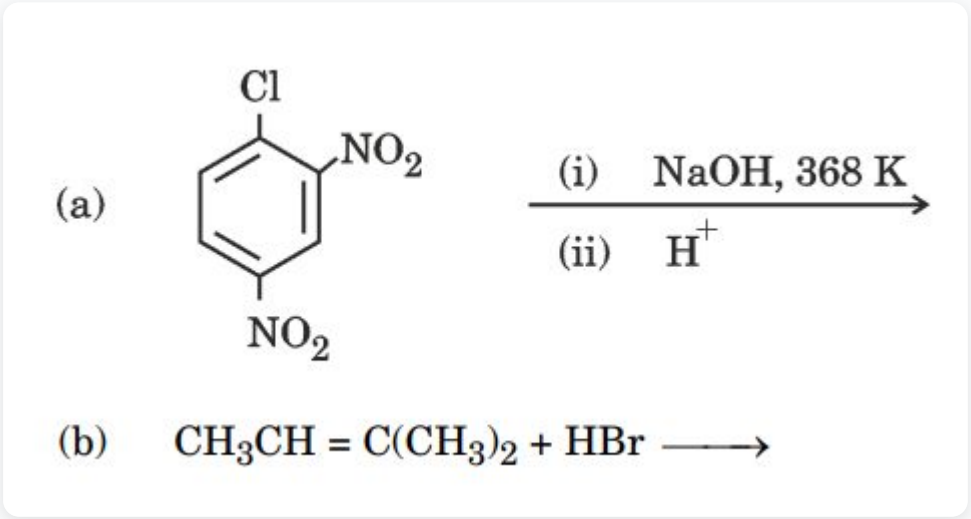
(b) DNA containing Thymine

[2 Marks]

Question 25.

Draw the structures of major product(s) in each of the following reactions :

[2 Marks]

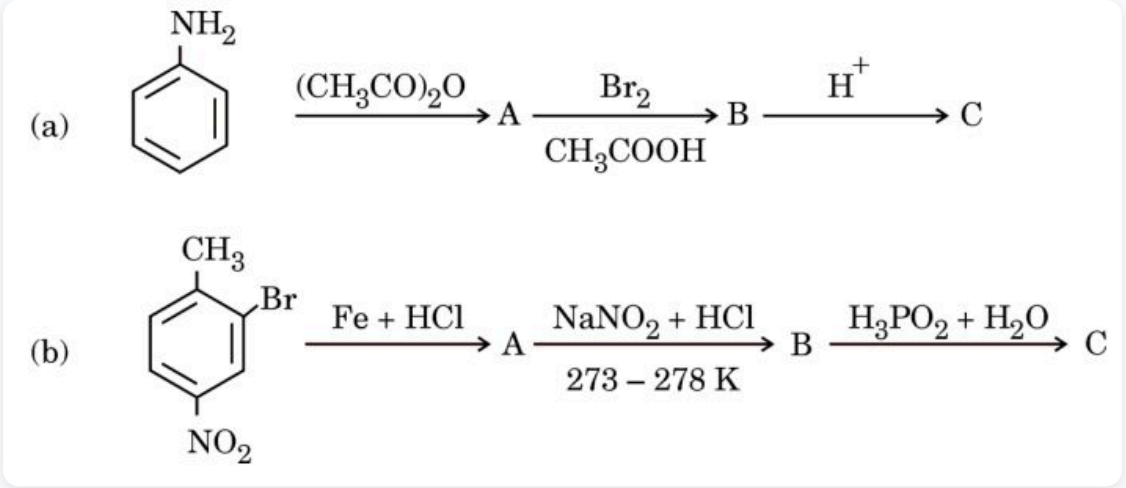


Section D

Question 26.

Write the structures of A, B and C in the following reactions :

[3 Marks]



Question 27.

What happens when :

(a) Propanenitrile is treated with phenyl magnesium bromide followed by hydrolysis ?

(b) p-fluorotoluene is treated with CrO_3 in the presence of acetic anhydride followed by hydrolysis with aqueous acid.

(c) Phthalic acid is treated with NH_3 followed by heating ?

Write chemical reactions in support of your answer.

[3 Marks]

Question 28.

Answer the following questions :

(a) Why is direct current (DC) not used to measure the resistance of an ionic solution ?

(b) Why are the products of electrolysis different for the electrolysis of aqueous solution of $AgNO_3$ with silver electrodes and electrolysis of aqueous solution of $AgNO_3$ with platinum electrodes ?

(c) Why are magnesium blocks fixed to the iron pipelines carrying water ?

[3 Marks]

Question 29.

When a coordination compound $CoCl_3 . 6NH_3$ is mixed with excess of $AgNO_3$ solution, 3 moles of AgCl are precipitated per mole of the compound. Write the structural formula of the complex, IUPAC name, its hybridisation and magnetic behaviour on the basis of valence bond theory.

[3 Marks]

Question 30.

(i) How many geometrical isomers are possible in each of the following complexes ?

(I) $[Cr(C_2O)_3]^{3-}$

(II) $[Co(NH_3)_3Cl_3]$

(ii) $[Co(NH_3)_6]^{3+}$ is an inner orbital complex whereas $[Ni(NH_3)_6]^{2+}$ is an outer orbital complex. Why ?

[Atomic number : Co = 27, Ni = 28]

(iii) Write the formula of Wilkinson catalyst and its use.

[3 Marks]

Question 31.

Calculate the vapour pressure of a solution containing 61 g of benzoic acid (molar mass = 122 g mol^{-1}) dissolved in 500 g of benzene when the vapour pressure of pure benzene at this temperature of experiment is 66 torr. Assume complete dimerization of benzoic acid in benzene.

[3 Marks]

Question 32.

Consider the decomposition of hydrogen peroxide (H_2O_2) as per the equation given below :

$2H_2O_2 \xrightarrow{I^-/\text{Alkaline Medium}} 2H_2O + O_2$

The mechanism for this reaction was found to be :

Step I : $H_2O_2 + I^- \rightarrow H_2O + IO^-$ (slow)

Step II : $H_2O_2 + IO^- \rightarrow H_2O + I^- + O2$ (fast)

(a) Write the rate law expression.

(b) Determine the order of reaction with respect to H_2O_2, I^- and overall order of reaction.

(c) What is the molecularity of the reaction in Step II ?

[3 Marks]

Question 33.

Answer the following :

(a) Which isomer of C_4H_9Br is most reactive towards S_N1 reaction ?

(b) Predict the alkene that would be formed by dehydrohalogenation of 1-Bromo-1-methylcyclohexane.

(c) Although chlorine shows strong – I effect, yet it is ortho- and para-directing in electrophilic aromatic substitution reactions. Why

[3 Marks]

Section E

Question 34.

(i) Account for the following :

(I) MnO is basic while Mn_2O_7 is acidic.

(II) Iron has higher enthalpy of atomization than that of copper.

(III) Mn^{3+} is a stronger oxidising agent than Cr^{3+}.

(ii) How do you prepare potassium dichromate from sodium chromate ? Write balanced chemical equation for each step.

[5 Marks]

Question 35.

Answer the following questions :

(i) Why is chemistry of actinoids more complicated as compared to lanthanoids ?

(ii) $E°_M^{2+}/M$ values are not regular for first row transition elements (3d series). Why ?

(iii) Identify the following :

(I) Oxoanion of chromium which is stable in acidic medium.

(II) The lanthanoid element that exhibits +4 oxidation state.

(iv) Write the products obtained on heating $KMnO_4$.

(v) Predict which of the following ions will be coloured in aqueous solution :

Cu^+, Sc^{3+}, Fe^{2+}, Ti^{3+}, Zn^{2+}

[5 Marks]

Question 36.

(i) How will you bring about the following conversions :

(I) Bromobenzene to 1-phenylethanol

(II) Benzene to m-nitroacetophenone

(ii) An organic compound with the molecular formula C_8H_8O forms 2,4-DNP derivative, reduces Tollens' reagent and undergoes Cannizzaro reaction. On vigorous oxidation with acidic or alkaline $KMnO_4$ it gives Benzene-1,2-dicarboxylic acid. Identify the compound and write the products when it undergoes Cannizzaro reaction.

(iii) Arrange the following compounds in increasing order of their acid strength :

C_6H_5COOH, $O_2N - CH_2 - COOH$, $CF_3 - COOH$, HCOOH

[5 Marks]

Question 37.

(i) Write the products formed when benzaldehyde reacts with the following reagents :

(I) 2,4-Dinitrophenylhydrazine

(II) Acetophenone in the presence of dilute NaOH followed by heating

(ii) Give reasons for the following :

(I) Benzoic acid does not undergo Friedel-Crafts reaction.

(II) Carboxylic acids have higher boiling point than alcohols of comparable molecular mass.

(iii) Write simple chemical test to distinguish between propanal and propanone.

[5 Marks]

Question 38.

(i) Calculate E°_cell for the following reaction which is at equilibrium :

$Cu\ (s) + 2Ag^{+}\ (aq) \rightleftharpoons Cu^{2+}\ (aq) + 2Ag\ (s)$

Equilibrium constant (K_c) for the cell is 10^{15}.

[Given : log 10 = 1]

(ii) Write anode, cathode and overall reaction of lead storage battery when it is in use.

(iii) How much electricity is required in coulombs for the oxidation of 1 mol of FeO to Fe_2O_3?

[5 Marks]

Question 39.

(i) Conductivity of 0·0024 M acetic acid is $7{\cdot}2 \times 10^{-5}$ S cm^{-1}. If Λ°_m for acetic acid is 390·5 S cm^2 mol^{-1}, then calculate the degree of dissociation (α) of acetic acid.

(ii) Calculate the cell potential for the following half cell reaction at 25ºC :

$Ag^{+}(aq) + 1\ e^{-} \rightarrow Ag\ (s)$

Given that : $[Ag^{+}] = 0{\cdot}01$ M and

$E^{\circ}_{Ag^{+}/Ag} = + 0{\cdot}80$ V

[log 10 = 1]

(iii) Write the name of the electrolyte used in :

(I) Dry cell

(II) Fuel cell ($H_2 – O_2$)

[5 Marks]