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. Osmosis is a process by which the molecules of a solvent pass from a solution of low solute concentration to a solution of high solute concentration through a semi-permeable membrane. Osmotic pressure is a colligative property. When the applied pressure on a solution exceeds its osmotic pressure, reverse osmosis occurs. When two solutions are separated by a semipermeable membrane and they have same osmotic pressure they are said to be isotonic. Of the two solutions separated by a semipermeable membrane, if one is a lower osmotic pressure, it is said to be hypotonic relative to the second solution. If it has a higher osmotic pressure, than the second solution, it is said to be hypertonic relative to the second solution. The osmotic pressure associated with the

fluid inside the blood cell is equivalent to that of 0.9% (mass/volume) sodium chloride solution called normal saline solution and it is safe to inject intravenously. Osmotic pressure is vital in daily life and nature. It helps in explain, why IV fluids match blood's osmotic pressure, its also the principle behind food preservation using salt or sugar.

Question 2. Osmosis is a process by which the molecules of a solvent pass from a solution of low solute concentration to a solution of high solute concentration through a semi-permeable membrane. Osmotic pressure is a colligative property. When the applied pressure on a solution exceeds its osmotic pressure, reverse osmosis occurs. When two solutions are separated by a semipermeable membrane and they have same osmotic pressure they are said to be isotonic. Of the two solutions separated by a semipermeable membrane, if one is a lower osmotic pressure, it is said to be hypotonic relative to the second solution. If it has a higher osmotic pressure, than the second solution, it is said to be hypertonic relative to the second solution. The osmotic pressure associated with the fluid inside the blood cell is equivalent to that of 0.9% (mass/volume) sodium chloride solution called normal saline solution and it is safe to inject intravenously. Osmotic pressure is vital in daily life and nature. It helps in explain, why IV fluids match blood's osmotic pressure, its also the principle behind food preservation using salt or sugar.

> **(1) Calculate the amount of $CaCl_2$ (i = 2.59) dissolved in 2.46 litre of water such that its osmotic pressure is 0.70 atm at 27°C. [Given : R = 0.082 L atm K^{-1} mol^{-1}, molar mass of $CaCl_2$ = 111 g mol^{-1}]**
>
> [2 Marks]

> **(2) When raisins are kept in water, they get swollen. Name the phenomenon involved in this process.**
>
> [2 Marks]

Question 3. Osmosis is a process by which the molecules of a solvent pass from a solution of low solute concentration to a solution of high solute concentration through a semi-permeable membrane. Osmotic pressure is a colligative property. When the applied pressure on a solution exceeds its osmotic pressure, reverse osmosis occurs. When two solutions are separated by a semipermeable membrane and they have same osmotic pressure they are said to be isotonic. Of the two solutions separated by a semipermeable membrane, if one is a lower osmotic pressure, it is said to be hypotonic relative to the second solution. If it has a higher osmotic pressure, than the second solution, it is said to be hypertonic relative to the second solution. The osmotic pressure associated with the fluid inside the blood cell is equivalent to that of 0.9% (mass/volume) sodium chloride solution called normal saline solution and it is safe to inject intravenously. Osmotic pressure is vital in daily life and nature. It helps in explain, why IV fluids match blood's osmotic pressure, its also the principle behind food preservation using salt or sugar.

(1) Why osmotic pressure is more advantageous than other colligative properties ?

[2 Marks]

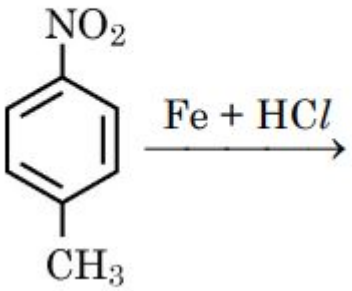
(2) Which phenomenon is responsible for desalination of sea water ?

[2 Marks]

Question 4. Like NH_3, nitrogen atom of amine is trivalent and carries an unshared pair of electrons. Nitrogen orbitals in amines are therefore sp^3 hybridised and the geometry of amines is pyramidal. Lower aliphatic amines are soluble in water due to the formation of hydrogen bond with water molecules. The solubility decreases as the molar mass of amines increases due to increase in size of hydrophobic part. Higher amines are insoluble in water. However amines are less soluble in water than alcohols because of low electronegativity of nitrogen as compared to oxygen. Boiling points of isomeric amines follow the order $1^o > 2^o > 3^o$. It is due to the fact the amines are held together due to hydrogen bonding. Extent of hydrogen bonding is more in primary amines than in secondary amines as two hydrogen atoms are available for hydrogen bond formation. Tertiary amines do not show hydrogen bonding because of the absence of hydrogen atom attached to nitrogen. Amines can be prepared from, nitro compounds, nitriles, amides etc.

(1) Complete the following equations :

(i) $CH_3CONH_2 \xrightarrow[(ii)\ H_2O]{(i)\ LiAlH_4}$

(ii) 

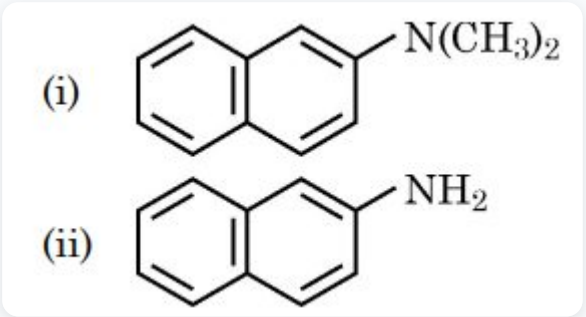
[2 Marks]

(2) Why primary amines have higher boiling points than tertiary amines ?

[2 Marks]

Question 5. Like NH_3, nitrogen atom of amine is trivalent and carries an unshared pair of electrons. Nitrogen orbitals in amines are therefore sp^3 hybridised and the geometry of amines is pyramidal. Lower aliphatic amines are soluble in water due to the formation of hydrogen bond with water molecules. The solubility decreases as the molar mass of amines increases due to increase in size of hydrophobic part. Higher amines are insoluble in water. However amines are less soluble in water than alcohols because of low electronegativity of nitrogen as compared to oxygen. Boiling points of isomeric amines follow the order $1^o > 2^o > 3^o$. It is due to the fact the amines are held together due to hydrogen bonding. Extent of hydrogen bonding is more in primary amines than in secondary amines as two hydrogen atoms are available for hydrogen bond formation. Tertiary amines do not show hydrogen bonding because of the absence of hydrogen atom attached to nitrogen. Amines can be prepared from, nitro compounds, nitriles, amides etc.

(1) Classify the following amines as primary, secondary or tertiary :



[2 Marks]

(2) Out of Butan–1–amine and Butan–1–ol, which is more soluble in water ?

[2 Marks]

Section B

Question 6. Consider the following reaction : $Zn_(s)+Ag_2O_(s)+H_2O(l) \rightarrow Zn^{2+}_(aq)+2Ag_(s)+2OH^-_(aq)$ Given : $E^\circ_Ag^+/Ag=0.80V$ $E^\circ_Zn^{2+}/Zn = -0.76$ V $1F= 96500 C mol^{-1}$ Δ_rG° for the above reaction is :

[1 Marks]

(A) – 301.080 kJ mol^{-1}

(B) + 310.080 kJ mol^{-1}

(C) –326.070 kJ mol^{-1}

(D) –375.060 kJ mol^{-1}

Question 7.

Identify the correct statement :

[1 Marks]

(A) For complex reactions molecularity has no meaning.

(B) Molecularity of a reaction is an experimental quantity.

(C) Molecularity of a reaction can be zero or even a fraction.

(D) Molecularity more than three is very common in chemical reactions.

Question 8. The order for the given reaction is : $A + 2B \rightarrow$ Products Rate = $k[A]^{1/2}[B]^{1}$

[1 Marks]

(A) 1.5

(B) 0.5

(C) 1

(D) 2

Question 9.

Electronic configuration of chromium is :

[1 Marks]

(A) $[Ar]\ 3d^5\ 4s^1$

(B) $[Ar]\ 3d^5\ 4s^2$

(C) $[Ar]\ 3d^4\ 4s^1$

(D) $[Ar]\ 3d^4\ 4s^2$

Question 10.

The correct IUPAC name of the complex $[Pt(NH_3)_2Cl_2]$ is :

[1 Marks]

(A) dichloridodiammineplatinum (II)

(B) diamminedichloridoplatinum (IV)

(C) diamminedichloridoplatinum (II)

(D) dichloridodiammineplatinum (IV)

Question 11.

Which of the following is heteroleptic complex ?

[1 Marks]

(A) $[Co(NH_3)_4Cl_2]^+$

(B) $[Cr(NH_3)_6]^{3+}$

(C) $[Ni(H_2O)_6]^{2+}$

(D) $[Co(NH_3)_6]^{3+}$

Question 12.

Which of the following molecules is chiral in nature ?

[1 Marks]

(A) Propan–2–ol

(B) Butan–2–ol

(C) 2–Bromopropane

(D) 1–Bromobutane

Question 13.

Identify the correct increasing order of boiling points of the given compounds :

[1 Marks]

(A) Propan–1– ol < butan–1–ol < butan –2–ol < pentan–1–ol

(B) Pentan–1– ol < butan–1–ol < butan –2–ol < Propan–1–ol

(C) Propan–1– ol < butan–2–ol < butan –1–ol < pentan–1–ol

(D) Butan–1– ol < Butan–2–ol < Propan –1–ol < Pentan–1–ol

Question 14. Identify the compound produced by the reduction of Ethanenitrile with Lithium aluminium hydride :

[1 Marks]

(A) Ethylamine

(B) Ethanal

(C) Methylamine

(D) Propylamine

Question 15.

The base which is present in DNA but not in RNA is

[1 Marks]

(A) Adenine

(B) Cytosine

(C) Thymine

(D) Guanine

Question 16.

Proteins are polymers of α-amino acids which are joined to each other by :

[1 Marks]

(A) Glycosidic Bond

(B) Covalent Bond

(C) Coordinate Bond

(D) Peptide Bond

Question 17.

Which of the following reactions is not explained by the open chain structure of glucose ?

[1 Marks]

(A) Glucose on prolonged heating with HI forms n-hexane.

(B) Glucose gets oxidized to gluconic acid on reaction with bromine water.

(C) Glucose reacts with hydroxylamine to form an oxime.

(D) Glucose exists in two different crystalline forms, alpha (α) and beta (β).

Question 18. Assertion (A) : The molecularity of the given reaction is 2 $2HI \rightarrow H_2 + I_2$ Reason (R) : Two molecules of the reactants are involved in simultaneous collision between them.

[1 Marks]

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

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

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

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

Question 19. Assertion (A) : Zinc, cadmium and mercury are not considered as transition elements. Reason (R) : These elements have completely filled orbitals in their ground state as well as in their common oxidation states.

[1 Marks]

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

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

(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 false, but Reason (R) is true.

Question 20.

Assertion (A) : Aromatic primary amines can be prepared by Gabriel Phthalimide synthesis. Reason (R) : Aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide.

[1 Marks]

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

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

(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).

Question 21.

Assertion (A) : Glucose gets oxidized to six carbon gluconic acid on reaction with bromine water.
Reason (R) : The carbonyl group is absent in the open chain structure of glucose.

[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 false, but Reason (R) is true.

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

Section C

Question 22.

The concentration of the reactant is reduced from 0.6 mol L^{-1} to 0.2 mol L^{-1} in 5 minutes in a first order reaction. Calculate rate constant of the reaction. (log 3 = 0.48)

[2 Marks]

Question 23.

Rate constant k for the first order reaction is 2.54×10^{-3} s^{-1}. Calculate the time required for three-fourth of the reactant to decompose. (log 4 = 0.60)

[2 Marks]

Question 24.

(a) Define activation energy.

(b) Write the unit of rate constant for

(i) zero order reaction,

(ii) second order reaction.

[2 Marks]

Question 25.

(a) First ionization enthalpy of Cr is lower than that of Zn. Why ?

(b) Mention any one property of the transition elements which makes them good catalysts.

[2 Marks]

Question 26.

(a) Define coordination number.

(b) Indicate the type of isomerism exhibited by the following complex : $[Co(en)_3]Cl_3$

[2 Marks]

Question 27.

(a) Draw the structure of the given compound :

4–Bromo–3–methylpent–2–ene

(b) What happens when chloroethane is treated with aqueous potassium hydroxide ?

[2 Marks]

Section D

Question 28.

When 1.5 g of a non-volatile solute was dissolved in 90 g of benzene, the boiling point of benzene got raised from 353.23 K to 353.93 K. Calculate the molar mass of the solute. (Given K_b for benzene = 2.52 K kg mol^{-1})

[3 Marks]

Question 29.

Calculate emf of the following cell at 298 K :

$Sn \mid Sn^{2+}$ (0.001 M) || H^+ (0.01 M) | $H_2(g)$ (1 bar) | Pt(s)

Given : $E°_Sn^{2+}/Sn$ = – 0.14 V,

$E°_H^+/H_2$ = 0.00 V [log 10 = 1]

[3 Marks]

Question 30.

Complete and balance the following equations :

(i) $2KMnO_4 \xrightarrow{-513\ K}$

(ii) $Na_2Cr_2O_7 + 2KCl \rightarrow$

(b) Why is it difficult to separate lanthanoid elements in pure state ?

[3 Marks]

Question 31.

(a) $[Co(NH_3)_6]^{3+}$ is diamagnetic whereas $[CoF_6]^{3-}$ is paramagnetic. Justify the statement. [Atomic number of Co = 27]

(b) Write the electronic configuration for d4 ion if $\Delta_0 > P$ on the basis of crystal field theory.

[3 Marks]

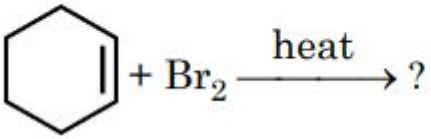
Question 32.

(b) Define Racemic mixture.

(c) p-dichlorobenzene has a higher melting point as compared to its ortho and meta isomers. Why ?

[3 Marks]

(a) Write the major product in the following reactions :



Question 33.

Write the reaction involved in

(a) Rosenmund's reduction

(b) Cannizzaro's reaction

(c) Hell – Volhard – Zelinsky reaction

[3 Marks]

Question 34.

Define the following term:

(a) Reducing sugar

(b) Differentiate between the following :

(i) Fibrous proteins and globular proteins

(ii) Nucleotide and nucleoside

[3 Marks]

Question 35.

Write the reaction of glucose with the following :

(a) H_2N – OH

(b) $(CH_3CO)_2O$

(c) conc.HNO_3

[3 Marks]

Section E

Question 36.

(a) Give chemical tests to distinguish between the following pairs of compounds :

(i) Acetophenone and Benzophenone

(ii) Propanal and Propanone

(iii) Pentan–2–one and Pentan–3–one

(b) (i) Which of the following acids is stronger and why ?

CH_2FCOOH, CH_3COOH

(ii) Arrange the following compounds in the increasing order of their boiling points :

CH_3OCH_3, $CH_3CH_2CH_3$, CH_3CH_2OH, CH_3CHO

[5 Marks]

Question 37.

(a) The conductivity of 0.1 mol L^{-1} solution of NaCl is 1.06×10^{-2} S cm^{-1}. Calculate its molar conductivity and degree of dissociation.

$\lambda^\circ_{Na^+} = 50.1$ S cm^2 mol^{-1}

$\lambda^\circ_{Cl^-} = 76.5$ S cm^2 mol^{-1}

(b) (i) Following cell reaction occurs in a galvanic cell :

$2Ag^+(aq) + Zn(s) \rightarrow 2Ag(s) + Zn^{2+}(aq)$ $E^\circ_{(cell)} = +1.56$ V

Predict the direction of flow of current.

(ii) Differentiate between a primary battery and a secondary battery.

[5 Marks]

Question 38.

(a) Resistance of a conductivity cell filled with 0.1 M KCl solution is 100 Ω. If the resistance of the same cell when filled with 0.01 mol L^{-1} KCl solution is 300 Ω, calculate the conductivity and molar conductivity of 0.01 mol L^{-1} KCl solution. The conductivity of 0.1 M KCl solution is 1.29×10^{-2} S cm^{-1}.

(b) (i) Write any two advantages of $H_2 - O_2$ fuel cell.

(ii) Why does the cell potential of mercury cell remain constant throughout the life ?

[5 Marks]

Question 39.

An organic compound ‘A’, with molecular formula C_2H_6O reacts with active metals such as sodium to give compound ‘B’ and hydrogen gas. 'A' on treatment with iodine and sodium hydroxide gives ‘C’ and in presence of H_2SO_4 at 413 K gives ‘D’ ($C_4H_{10}O$). ‘D’ on reaction with excess of HI gives ‘E’. Identify ‘A’, ‘B’, ‘C’, ‘D’ and ‘E’ and write all the reactions involved.

[5 Marks]

Question 40.

Write the reagents which are used in the given conversions :

(i) Phenol to 2, 4, 6 – tribromophenol

(ii) Propene to propan–1–ol

(iii) Butan–2–one to butan–2–ol

(b) Explain the mechanism of acid catalyzed hydration of alkene to form corresponding alcohol.

[5 Marks]

Question 41.

(a) How will you convert the following :

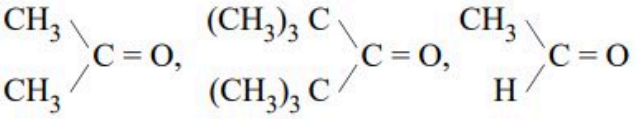
(i) Propanone to Propene

(ii) Benzoic acid to Benzaldehyde

(iii) Benzene to m-Nitroacetophenone

[5 Marks]

(b) (i) Arrange the following compounds in increasing order of their reactivity towards HCN :



(ii) Identify the compounds, which would undergo Aldol condensation :

