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UP BOARD • PREVIOUS 10 YEARS' QUESTION PAPERS

Class 12 (Intermediate) Chemistry

All ten years in one book — every paper in full, questions only, as printed in the original papers.

Class 12 (Intermediate)
Subject: Chemistry
Years covered: 2017–2026 | Papers inside: 4 of 10 years
Maximum marks: 70

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Rebuilt in KAMALDNP design for practice. Content identical to the source papers; see Rebuild Notes at the end of each paper. Years not yet found are listed plainly in the Contents — no paper is ever faked.

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Contents

One paper per year, newest first. A year marked “Not found yet” means no complete, verified copy of that year’s paper has been found so far — it will be added when one is verified. 2021 had no board exams.

Year	Set / Code	Exam held	Marks	Page
2026	347 ED	25 February 2026	70	3
2025	347 KA	8 March 2025	70	7
2024	347 FZ	7 March 2024	70	11
2023	347 BZ	4 March 2023	70	15
2022	—	Not found yet	—	—
2021	—	No board exams were held (COVID-19)	—	—
2020	—	Not found yet	—	—
2019	—	Not found yet	—	—
2018	—	Not found yet	—	—
2017	—	Not found yet	—	—

Source: third-party transcriptions of the original UP Board papers (no official UP Board previous-year archive exists). English text only; the originals are bilingual (Hindi + English).

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UP BOARD • CLASS 12 (INTERMEDIATE)

Class 12 Chemistry 2026

Set 347 ED — 3 hours 15 minutes — Maximum Marks: 70

Exam: 25 February 2026, 2:00 PM – 5:15 PM | Time allowed: 3 hours 15 minutes | Maximum marks: 70 | Total questions: 26

General Instructions

1. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
3. Section A is of multiple choice type and each question carries 1 mark.
4. Section B is of very short answer type and each question carries 2 marks.
5. Section C is of short answer type and each question carries 3 marks.
6. Section D is of short answer type and each question carries 4 marks.
7. Section E is of long answer type. Each question carries 5 marks. Internal choice has been given in each question of this section. You have to do only one question from the choices given in the question.
8. There is no negative marking.
9. The symbols used in the question paper have usual meaning.

> **Note:** General instructions follow the standard UP Board format; the 2026 transcription source did not carry them. In the original paper, Q1–Q6 are printed as parts (a)–(f) of Question 1.

Section A

Multiple Choice Questions — 1 mark each

Q. 1 Read the following assertion and reason and choose the correct alternative. **[1 mark]**

Assertion: Osmotic pressure is a colligative property.

Reason: Osmotic pressure is directly proportional to molarity at a given temperature.

(A) Both assertion and reason are true and the reason is the correct explanation of assertion.

(B) Both assertion and reason are true but the reason is not the correct explanation of assertion.

(C) Assertion is correct but reason is wrong.

(D) Assertion is wrong but reason is correct.

Q. 2 Which of the following ions forms coloured solution? **[1 mark]**

(A) Ti^{4+} (B) Fe^{3+} (C) Zn^{2+} (D) Cu^{+}

Q. 3 Which type of isomerism exists between the complexes $[CoBr(NH_3)_5]SO_4$ and $[CoSO_4(NH_3)_5]Br$? **[1 mark]**

(A) Linkage isomerism

(B) Solvate isomerism

(C) Ionisation isomerism

(D) Coordination isomerism

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Q. 4 The reagent which does NOT react with both acetone and benzaldehyde is **[1 mark]**

(A) Sodium hydrogen sulphite (B) Benedict's reagent
(C) Grignard reagent (D) Phenyl hydrazine

Q. 5 When aniline is heated with $CHCl_3$ in the presence of KOH, the product formed is **[1 mark]**

(A) Phenyl isothiocyanate (B) Phenyl isocyanide
(C) Phenyl cyanide (D) Phenol

Q. 6 α-D(+)glucose and β-D(+)glucose are **[1 mark]**

(A) Geometrical isomers (B) Epimers
(C) Enantiomers (D) Anomers

Section B

Very Short Answer Questions — 2 marks each

Q. 7 Aqueous solution of sodium chloride boils at higher temperature than water, but it freezes at lower temperature than water. Explain with reason. **[2 marks]**

Q. 8 Mention the different steps for the preparation of potassium dichromate from iron chromite ore and draw the structure of dichromate ion. **[2 marks]**

Q. 9 Write IUPAC names of the following coordination compounds: (i) $[PtCl_2(en)_2](NO_3)_2$ (ii) $[Cr(NH_3)_6][Co(CN)_6]$ **[2 marks]**

Q. 10 Explain the mechanism of bimolecular nucleophilic substitution (SN_2) reaction of alkyl halide. **[2 marks]**

Q. 11 Define molality and molarity. **[2 marks]**

Q. 12 Explain why phenol is more acidic than ethyl alcohol. **[2 marks]**

Q. 13 Write the chemical equations when an aldehyde reacts with the following: (i) Tollen's reagent (ii) Fehling's reagent. (1+1=2) **[2 marks]**

Q. 14 Write a short note on the structure of nucleic acid. (2) **[2 marks]**

Section C

Short Answer Questions — 3 marks each

Q. 15 (i) Explain Henry's law. (ii) 200 ml of an aqueous solution of a protein contains 1.26 g of protein. The osmotic pressure of such a solution at 300 K is found to be 2.57×10^{-3} bar. Calculate the molar mass of the protein. (1+2=3) **[3 marks]**

Q. 16 Describe the charging and discharging mechanism of lead storage battery with the help of chemical reactions. (1½+1½=3) **[3 marks]**

Q. 17 Derive the integrated rate equation for first order reaction. Show that half life period for this reaction does not depend on initial concentration of the reactants. (2+1=3) **[3 marks]**

Q. 18 Compare the lanthanoid and actinoid elements with reference to the following: (i) Atomic and ionic sizes (ii) Oxidation state. (1½+1½=3) **[3 marks]**

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Section D

Short Answer Questions — 4 marks each*

Q. 19 (i) Define molar conductance of the solution of an electrolyte and discuss its change with the concentration. (ii) Calculate the electromotive force (EMF) of the following cell: Ni(s) | Ni^{2+}(0.16 M) ‖ Ag^{+}(0.002 M) | Ag(s) (Given: E°cell = 1.05 V, $\log_{10}2 = 0.3010$) **[4 marks]**

Q. 20 A first order reaction takes 10 min for 20% decomposition. Calculate the time taken for the reaction to go to 80% decomposition. (Given, $\log_{10}2 = 0.3010$) **[4 marks]**

Q. 21 (i) Discuss the violet colour of the complex $[Ti(H_2O)_6]^{3+}$ on the basis of crystal field theory. (ii) Explain with reason that $[NiCl_4]^{2-}$ is paramagnetic while $[Ni(CN)_4]^{2-}$ is diamagnetic. **[4 marks]**

Q. 22 Explain the following in relation to proteins: (i) Peptide bond (ii) Denaturation **[4 marks]**

Section E

Long Answer Questions — 5 marks each (attempt any one option in each question)

Q. 23 Write short notes on the following: (i) Coupling reaction (ii) Sandmeyer reaction (iii) Friedel-Craft reaction. (2+1½+1½=5) **[5 marks]**

— OR —

Write chemical equations for obtaining the following from benzene diazonium chloride: (i) Phenyl cyanide (ii) Bromobenzene (iii) Nitrobenzene (iv) p-hydroxyazobenzene (v) p-Aminoazobenzene. (1+1+1+1+1=5)

Q. 24 (i) Explain the mechanism of the formation of ethanol by acid catalyzed hydration of ethene. (ii) Explain hydroboration-oxidation reaction with an example. (2½+2½=5) **[5 marks]**

— OR —

What happens when? (Write chemical equations only) (i) Ethyl bromide reacts with sodium ethoxide. (ii) Phenol is heated with conc. HNO_3 in the presence of conc. H_2SO_4. (iii) Methoxybenzene is heated with acetyl chloride in the presence of anhydrous $AlCl_3$. (iv) Phenol reacts with chloroform in the presence of aqueous NaOH. (v) Ethyl methyl ether is heated with conc. HI. (1+1+1+1+1=5)

Q. 25 (a) Write short notes on the following: (i) Cannizzaro's reaction (ii) Aldol condensation (iii) Gattermann-Koch reaction. (2+1½+1½=5) **[5 marks]**

— OR —

How will you obtain (write chemical equations only): (i) Benzaldehyde from Toluene (ii) Benzamide from Benzoic acid (iii) Phthalimide from Phthalic acid (iv) m-nitrobenzaldehyde from Benzaldehyde (v) Benzaldehyde from Benzene. (1+1+1+1+1=5)

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Q. 26 (b) (i) Describe any one method for the identification of primary, secondary and tertiary amines. Also write the chemical reactions. (ii) Write a short note on Gabriel Phthalimide Synthesis. (3+2=5) **[5 marks]**

— OR —

How will you obtain (write chemical equations only): (i) Benzene diazonium chloride from Aniline (ii) Methylamine from Acetamide (iii) Aniline from Nitrobenzene. (2+1½+1½=5)

Rebuild Notes

This paper was rebuilt in KAMALDNP design from a third-party transcription of the original UP Board paper. Questions, order and marks are as printed in the source; answers and solutions are not included. Where the transcription was unclear or contradicted the Hindi original, the point is flagged below.

1. Marks for Q19–Q22 are not printed in the source transcription; 4 marks each is inferred from the paper total (6 + 16 + 12 + 16 + 20 = 70).
2. Q23 is labelled without (a)/(b) in the source; Q25 is labelled “(a)” and Q26 “(b)” — reproduced as printed.
3. The source article’s pattern note wrongly says “Section E (Q6 to Q7)”; the 5-mark questions are Q23–Q26.

Source (third-party transcription): https://collegedunia.com/articles/e-737-up-board-class-12-chemistry-2026-set-347-ed-question-paper-with-solutions

English text only. The original paper is bilingual (Hindi + English); a Hindi side is a follow-up round, not this one. No official UP Board previous-year archive exists, so every paper in this volume is third-party-source.

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UP BOARD • CLASS 12 (INTERMEDIATE)

Class 12 Chemistry 2025

Set 347 KA — 3 hours 15 minutes — Maximum Marks: 70

Exam: 8 March 2025, 2:00 PM – 5:15 PM | Time allowed: 3 hours 15 minutes | Maximum marks: 70 | Total questions: 26

General Instructions

1. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
3. Section A is of multiple choice type and each question carries 1 mark.
4. Section B is of very short answer type and each question carries 2 marks.
5. Section C is of short answer type and each question carries 3 marks.
6. Section D is of short answer type and each question carries 4 marks.
7. Section E is of long answer type. Each question carries 5 marks. Internal choice has been given in each question of this section. You have to do only one question from the choices given in the question.
8. There is no negative marking.
9. The symbols used in the question paper have usual meaning.

> **Note:** General instructions follow the standard UP Board format; the 2025 transcription source did not carry them. In the original paper, Q1–Q6 are printed as parts (a)–(f) of Question 1, and similarly for Questions 2–7.

Section A

Multiple Choice Questions — 1 mark each

Q. 1 Example of gaseous solution is **[1 mark]**

(A) Solution of camphor in nitrogen. (B) Solution of hydrogen in palladium.
(C) Amalgam of mercury with sodium. (D) Oxygen dissolved in water.

Q. 2 Compound of which transition metal ion is colourless? **[1 mark]**

(A) Cr^{3+} (B) Co^{2+} (C) Ni^{2+} (D) Zn^{2+}

Q. 3 Oxidation number of cobalt in $K[Co(CO)_4]$ is **[1 mark]**

(A) −1 (B) +3 (C) −1 (D) −3

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Q. 4 The correct order of increasing acid strength is **[1 mark]**

(A) Phenol < Ethanol < Chloroacetic acid < Acetic acid
(B) Chloroacetic acid < Acetic acid < Ethanol < Phenol
(C) Ethanol < Phenol < Acetic acid < Chloroacetic acid
(D) Phenol < Acetic acid < Chloroacetic acid < Ethanol

Q. 5 Which of the following gives a positive Fehling's solution test? **[1 mark]**

(A) Glucose (B) Sucrose (C) Fat (D) Protein

Q. 6 Best method of preparing primary amines from alkyl halides without changing the number of carbon atoms in the chain is **[1 mark]**

(A) Hofmann bromide reaction
(B) Gabriel's phthalimide synthesis
(C) Sandmeyer reaction
(D) Reaction with NH_3

Section B

Very Short Answer Questions — 2 marks each

Q. 7 In a solution 30 mass percent of benzene is dissolved in carbon tetrachloride. Calculate mole fraction of benzene. **[2 marks]**

Q. 8 Explain Raoult's Law. **[2 marks]**

Q. 9 Transition metals and their maximum compounds are paramagnetic. Explain it. **[2 marks]**

Q. 10 The spin-only magnetic moment value of $[MnBr_4]^{2-}$ is 5.9 BM. What will be the geometry of the complex ion? **[2 marks]**

Q. 11 Write the uses of carbon tetrachloride and chloroform. **[2 marks]**

Q. 12 Boiling point of propanol is greater than butane. Explain. **[2 marks]**

Q. 13 Explain Cannizzaro reaction with chemical equation. **[2 marks]**

Q. 14 What is nucleic acid? Write two important properties of them. **[2 marks]**

Section C

Short Answer Questions — 3 marks each

Q. 15 A cell in which the following reaction occurs: $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$ has standard electrode potential $E°_{cell} = 1.1$ V at 298 K. Calculate the standard Gibbs energy and the equilibrium constant of the cell reaction. **[3 marks]**

Q. 16 How do the following factors affect the velocity of reaction? (i) Concentration (ii) Temperature (iii) Catalyst **[3 marks]**

Q. 17 Describe the method of preparation of potassium permanganate. How does acidic potassium permanganate react with the following? Give ionic equations: (i) H_2S (ii) Fe (iii) iodide ion. **[3 marks]**

Q. 18 What is elevation of boiling point? A liquid has boiling point 353.23 K. The boiling point of solution becomes 354.11 K after dissolving 1.8 g non-volatile solute of molar mass 58 g mol^{-1} to 90 g liquid. Calculate boiling point elevation constant for the liquid. **[3 marks]**

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Section D

Short Answer Questions — 4 marks each

Q. 19 Explain in brief the Faraday's laws of Electrolysis. $CuSO_4$ solution was electrolysed for 20 minutes with 2.0 ampere current. What will be the mass of precipitated copper at cathode? **[4 marks]**

Q. 20 A first order reaction completes 20% in 10 minutes. Calculate the time taken for 75% completion. **[4 marks]**

Q. 21 (i) Write formula of the following coordination compounds: (i) Tetraamine diaqua cobalt(III) chloride (ii) Potassium trioxalato chromate(III) **[4 marks]**

Q. 22 Explain the following terms: (i) Zwitter ion (ii) Peptide bond (iii) Primary structure of protein (iv) Polysaccharides **[4 marks]**

Section E

Long Answer Questions — 5 marks each (attempt any one option in each question)

Q. 23 Write structures of the following compounds: (i) 2-Chloro-3-methylpentane (ii) 1,4-dibromobut-2-ene (iii) 1-Bromo-2,2-dimethylpropane (iv) 1-Bromo-2-methylbut-2-ene (v) 1-Chloro-2-methylbenzene (1+1+1+1+1=5) **[5 marks]**

— OR —

Write the products of the following reactions: (i) $C_6H_5-CH=CH_2 + HBr \rightarrow$ (ii) $C_6H_5-CH_2-CH=CH_2 + HBr \rightarrow$ (iii) $C_6H_5-CH=CH-CH_3 + HBr$ (in presence of peroxides) → (iv) $C_6H_5Br + 2Na + Br-(CH_2)_4CH_3 \xrightarrow{\text{(dry ether, } \Delta)} $ (v) $C_6H_5-NH_2 + NaNO_2/HX$ (273–278 K) → (1+1+1+1+1=5)

Q. 24 What do you understand by dehydration reaction? Write the mechanism of dehydration reaction of alcohol. **[5 marks]**

— OR —

Explain the following reactions with examples: (i) Kolbe reaction (ii) Reimer–Tiemann reaction (iii) Williamson Ether synthesis

Q. 25 Write IUPAC names of the following compounds: (i) a benzene ring with –CHO and an adjacent $–CH_3$ group (ii) $(CH_3)_2CHCOCH(CH_3)_2$ (iii) $CH_3CH(OCH_3)CHO$ (iv) $HOOC–(CH_2)_4–COOH$ (v) a benzene ring with a $–CH_2COOH$ group (1+1+1+1+1=5) **[5 marks]**

— OR —

An organic compound (A) which has molecular formula C_8H_8O, produces orange-red precipitate with 2,4-dinitrophenylhydrazine (2,4-DNP) reagent and forms a yellow precipitate on heating with iodine in presence of sodium hydroxide. This compound does not reduce Tollen's reagent or Fehling's solution and decolours Br_2-water or Baeyer's reagent. It forms a carboxylic acid (B) by strong oxidation with chromic acid, which has molecular formula $C_7H_6O_2$. Recognise compound (A) and (B) and explain the reactions involved in it.

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Q. 26 Give the structures of A, B, and C in the following reaction sequences: (i) CH_3CH_2I —(NaCN)→ A —(HO^-/H_2O)→ B —(Br_2/NaOH)→ C (ii) $C_6H_5N_2^+Cl^-$ —(CuCN)→ A —(H_3O^+)→ B —(Δ, NH_3)→ C (iii) CH_3CH_2Br —(KCN)→ A —($LiAlH_4$)→ B —(HNO_2, 273 K)→ C **[5 marks]**

— OR —

Describe the method of identification of primary, secondary and tertiary amines. Write the chemical equations of these reactions also. The boiling points of amines are lower than their comparable alcohols and carboxylic acids. Explain.

Rebuild Notes

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1. Q3: options (A) and (C) are both "−1" in the source article and in the text solutions PDF; reproduced as printed.
2. Q9: "Transition metals and their maximum compounds are paramagnetic." is as printed in both the article and the text solutions PDF; reproduced as printed.
3. Q15: the source article garbles the state symbols; written as $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$, $E°cell = 1.1$ V at 298 K.
4. Q21: the source article labels the two parts (x) and (y); rendered as (i) and (ii).
5. Q23 (OR): the five reactions are structural diagrams in the source article; the reactants are recovered from the text solutions PDF.
6. Q25: compounds (i) and (v) are structural diagrams in the source article; described here from the article's own parenthetical descriptions (benzene ring with –CHO and adjacent $–CH_3$; benzene ring with $–CH_2COOH$).
7. Q26: the source article drops the reaction arrows; restored as —(reagent)→ per the text solutions PDF.

Source (third-party transcription): https://collegedunia.com/articles/e-737-up-board-class-12-chemistry-question-paper-2025-code-347-ka

Cross-checked against: https://image-static.collegedunia.com/public/image/UP_Board_Class_12_Chemistry_347_KA_2025_Question_Paper_with_Solutions_dcbb37915c97557b1e508fbf863024c9.p

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UP BOARD • CLASS 12 (INTERMEDIATE)

Class 12 Chemistry 2024

Set 347 FZ — 3 hours 15 minutes — Maximum Marks: 70

Exam: 7 March 2024, 2:00 PM – 5:15 PM | Time allowed: 3 hours 15 minutes | Maximum marks: 70 | Total questions: 26

General Instructions

1. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
3. Section A is of multiple choice type and each question carries 1 mark.
4. Section B is of very short answer type and each question carries 2 marks.
5. Section C is of short answer type and each question carries 3 marks.
6. Section D is of short answer type and each question carries 4 marks.
7. Section E is of long answer type. Each question carries 5 marks. Internal choice has been given in each question of this section. You have to do only one question from the choices given in the question.
8. There is no negative marking.
9. The symbols used in the question paper have usual meaning.

> **Note:** General instructions follow the standard UP Board format; the 2024 transcription source did not carry them. In the original paper, Q1–Q6 are printed as parts (a)–(f) of Question 1, and similarly for Questions 2–7.

Section A

Multiple Choice Questions — 1 mark each

Q. 1 5 g NaOH is dissolved in 450 mL solution. Molarity of the solution is: **[1 mark]**

(A) 0.125 mol L^{-1} (B) 0.139 mol L^{-1}
(C) 0.250 mol L^{-1} (D) 0.278 mol L^{-1}

Q. 2 The oxidation number of Cobalt in $K_3[Co(C_2O_4)_3]$ complex is: **[1 mark]**

(A) 1 (B) 2 (C) 3 (D) 6

Q. 3 The transition element in which variable oxidation state is not found, is: **[1 mark]**

(A) Sc (B) Ti (C) V (D) Cr

Q. 4 The compound having most basic strength is: **[1 mark]**

(A) $(CH_3)_2NH$ (B) CH_3NH_2 (C) $(CH_3)_3N$ (D) NH_3

Q. 5 The compound which is not a disaccharide is: **[1 mark]**

(A) Sucrose (B) Cellulose (C) Lactose (D) Maltose

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Q. 6 Which of the following compound is identified by Tollen's Reagent? **[1 mark]**

(A) Alcohol (B) Aldehyde

(C) Ketone (D) Carboxylic acid

Section B

Very Short Answer Questions — 2 marks each

Q. 7 30 g Ethylene glycol ($C_2H_6O_2$) was mixed in 450 g water. Calculate the following: (i) Depression in freezing point of solution (ii) Freezing point of solution **[2 marks]**

Q. 8 Define the following: (i) Mole fraction (ii) Molality **[2 marks]**

Q. 9 What is Lanthanoid Contraction? Discuss the effect of Lanthanoid Contraction. **[2 marks]**

Q. 10 Show the structure of geometrical isomers of $[Fe(NH_3)_2(CN)_4]^-$. **[2 marks]**

Q. 11 Recognise all the possible monochloro structural isomers formed by free radical chlorination of CH_3-CH_2-CH_2-CH_3. **[2 marks]**

Q. 12 Phenol shows acidic properties but ethanol is almost neutral. Explain with reason. **[2 marks]**

Q. 13 Differentiate between the following: (i) Acetaldehyde and Acetone (ii) Acetophenone and Benzophenone **[2 marks]**

Q. 14 What is the difference between nucleoside and nucleotide? Explain. **[2 marks]**

Section C

Short Answer Questions — 3 marks each

Q. 15 Define solution. In how many different ways may the concentration of a solution be expressed? Explain. **[3 marks]**

Q. 16 Define the conductance and molar conductance of a solution of any electrolyte. Discuss their variation with concentration. **[3 marks]**

Q. 17 What do you understand by first order reaction? The time taken in becoming 0.4 mol L^{-1} from initial concentration of 0.6 mol L^{-1} is 5 minutes in a first order reaction. How much time will be required for the initial concentration to reach 0.3 mol L^{-1}? **[3 marks]**

Q. 18 Describe with reason: (i) Fe^{2+} is a reducing agent while Mn^{2+} is an oxidising agent. (ii) Sc (Z = 21) is a transition element but Zn (Z = 30) is not. (iii) Transition elements and their compounds work as good catalysts. **[3 marks]**

Section D

Short Answer Questions — 4 marks each

Q. 19 (i) Cu(s) does not dissolve in HCl. Why? (ii) Can you keep copper sulphate solution in a vessel of zinc? Explain with reason. **[4 marks]**

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Q. 20 What is Activation Energy? At 600 K, on decomposition of ethyl iodide by following first order reaction, the velocity constant is $1.60 \times 10^{-5}\ s^{-1}$. Activation Energy of this reaction is 209 kJ/mole. Calculate velocity constant at 700 K temperature. $C_2H_5I(g) \rightarrow C_2H_4(g) + HI(g)$ **[4 marks]**

Q. 21 (i) Solution of $[Ni(H_2O)_6]^{2+}$ is green, but solution of $[Ni(CN)_4]^{2-}$ is colourless. Explain. (ii) $[Cr(NH_3)_6]^{3+}$ is paramagnetic, while $[Ni(CN)_4]^{2-}$ is diamagnetic. Explain. **[4 marks]**

Q. 22 Write the structural formula of fructose. Write chemical equations of three chemical properties of glucose. **[4 marks]**

Section E

Long Answer Questions — 5 marks each (attempt any one option in each question)

Q. 23 What happens when: (Give chemical equations only) (i) Ethyl bromide reacts with sodium ethoxide? (ii) Chlorobenzene reacts with nitric acid? (iii) Chlorobenzene is heated at 623 K and 300 atmospheric pressure with aqueous sodium hydroxide? (iv) Chlorobenzene reacts with sulphuric acid? (v) Ethyl chloride is heated with aqueous KOH? (1+1+1+1+1=5) **[5 marks]**

— OR —

What is electrophilic substitution reaction? Explain with chemical equation the reactions of electrophilic substitution reactions of halogenation, nitration and sulphonation of chlorobenzene.

Q. 24 Write IUPAC name of the following compounds: (i) $CH_3-CH(CH_3)-CH(OH)-C(CH_3)_2-CH_3$ (ii) $HO-CH_2-CH(OH)-CH_2OH$ (iii) $CH_3CH_2-O-CH(CH_3)-CH_2CH_3$ (iv) a benzene ring bearing –OH on one carbon and $–CH_3$ groups on the two carbons next to it (v) $CH_3-CH(Cl)-CH(CH_3)-CH(CH_3)-CH_2OH$ (1+1+1+1+1=5) **[5 marks]**

— OR —

Predict the products obtained in the following reactions: (i) $C_6H_5OC_2H_5$ + HBr → (ii) $C_6H_5OC_2H_5$ —(conc. H_2SO_4, conc. HNO_3)→ (iii) $CH_3-CH=CH_2$ —(H_2O/H^+)→ (iv) $CH_3-CH_2-CH(CH_3)-CHO$ —($NaBH_4$)→ (v) benzene-1,2-dicarboxylic acid —($SOCl_2$, heat)→ (1+1+1+1+1=5)

Q. 25 Write only chemical equations for the following changes: (i) Butanoic acid from Butan-1-ol (ii) Butanoic acid from Butanal (iii) 3-Nitrobenzoic acid from 3-Nitrobromobenzene (iv) Phenyl ethanoic acid from Benzyl alcohol (v) Acetamide from Acetic acid (1+1+1+1+1=5) **[5 marks]**

— OR —

A carboxylic acid 'B' and an alcohol 'C' was obtained after hydrolysis of an organic compound 'A' (molecular formula $C_8H_{16}O_2$) with dilute sulphuric acid. 'B' is produced on oxidation of 'C' with chromic acid. But-1-ene is obtained on dehydration of 'C'. Identify 'A', 'B' and 'C'. Write chemical equations for all the reactions involved.

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Q. 26 Differentiate between the following pairs of compounds by writing chemical equations of one chemical test: (i) Methylamine and dimethylamine (ii) Ethylamine and aniline (iii) Aniline and benzylamine (iv) Aniline and N-methylamine (v) Secondary and tertiary amine (1+1+1+1+1=5) **[5 marks]**

— OR —

Write short notes on the following: (i) Carbylamine reaction (ii) Diazotization (iii) Gabriel Phthalimide Synthesis

Rebuild Notes

This paper was rebuilt in KAMALDNP design from a third-party transcription of the original UP Board paper. Questions, order and marks are as printed in the source; answers and solutions are not included. Where the transcription was unclear or contradicted the Hindi original, the point is flagged below.

1. Q3: the source article reads “variable oxidation state in not found”; corrected to “is not found” — the text solutions PDF confirms “is”.
2. Q10: the source article reads $[Fe(NH_3)_2(CN_4)]^-$; corrected to $[Fe(NH_3)_2(CN)_4]^-$ — the text solutions PDF confirms the formula.
3. Q24: the five compounds are structural diagrams in the original paper; they are transcribed inline from the scanned original. The third-party solutions booklet's names for (i), (iv) and (v) do not match the printed structures, so the structures are reproduced as printed and no names are given here.
4. Q24 (OR): the five reactions are structural diagrams in the original paper; the reactants are taken from the scanned original and the text solutions PDF.

Source (third-party transcription): https://collegedunia.com/articles/e-737-up-board-class-12-chemistry-question-paper-2024-code-347-fz

Cross-checked against: https://assets.collegedunia.com/public/image/CHEMISTRY_UP_Board_12_347_FZ_3cca08e6af719c84b253e33fe58e3495.pdf

English text only. The original paper is bilingual (Hindi + English); a Hindi side is a follow-up round, not this one. No official UP Board previous-year archive exists, so every paper in this volume is third-party-source.

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UP BOARD • CLASS 12 (INTERMEDIATE)

Class 12 Chemistry 2023

Set 347 BZ — 3 hours 15 minutes — Maximum Marks: 70

Exam: 4 March 2023, 2:00 PM – 5:15 PM | Time allowed: 3 hours 15 minutes | Maximum marks: 70 | Total questions: 26

General Instructions

1. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
3. Section A is of multiple choice type and each question carries 1 mark.
4. Section B is of very short answer type and each question carries 2 marks.
5. Section C is of short answer type and each question carries 3 marks.
6. Section D is of short answer type and each question carries 4 marks.
7. Section E is of long answer type. Each question carries 5 marks. Internal choice has been given in each question of this section. You have to do only one question from the choices given in the question.
8. There is no negative marking.
9. The symbols used in the question paper have usual meaning.

> **Note:** General instructions follow the standard UP Board format; the 2023 transcription source did not carry them. In the original paper, Q1–Q6 are printed as parts (a)–(f) of Question 1, and similarly for Questions 2–7.

Section A

Multiple Choice Questions — 1 mark each

Q. 1 The number of atoms in a body centred cubic (bcc) unit cell is **[1 mark]**

(A) 1 (B) 2 (C) 4 (D) 6

Q. 2 3.0 g of acetic acid is dissolved in 80 g of benzene. The molality of the solution is **[1 mark]**

(A) 0.0625 mol kg^{-1}
(B) 0.00625 mol kg^{-1}
(C) 0.625 mol kg^{-1}
(D) 6.25 mol kg^{-1}

Q. 3 Velocity constant for a first order reaction is 2×10^{-3} s^{-1}. The half-life period for this reaction is **[1 mark]**

(A) 3.465×10^{3} s
(B) 3.465×10^{2} s
(C) 3.465×10^{-1} s
(D) 3.465×10^{-2} s

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Q. 4 The base not present in DNA is **[1 mark]**

(A) Adenine (B) Guanine (C) Cytosine (D) Uracil

Q. 5 IUPAC name of $CH_3-CH(OH)-CH(CH_3)-CH_3$ is **[1 mark]**

(A) 2-hydroxy 3-methyl butanal (B) 2-methyl butan-3-ol
(C) 3-methyl butan-2-ol (D) methyl hydroxybutanal

Q. 6 Hinsberg reagent is **[1 mark]**

(A) Ethyl oxalate (B) Trimethyl amine
(C) Benzene sulphonyl chloride (D) Benzyl chloride

Section B

Very Short Answer Questions — 2 marks each

Q. 7 An element forms ccp lattice. If the length of its core of unit cell is 408.6 pm, then calculate the density of the element. (Atomic weight = 107.9 u) **[2 marks]**

Q. 8 Explain the following defects: (i) Interstitial (ii) F-centred **[2 marks]**

Q. 9 What is Kohlrausch law? Write its applications. **[2 marks]**

Q. 10 On dissolution of 2.0 g of a non-electrolyte in 50.0 g benzene, its freezing point decreases by 0.40 K. The freezing point depression constant of benzene is 5.12 K kg mol^{-1}. Calculate the molar mass of the solute. **[2 marks]**

Q. 11 Explain the following: (i) Electrophoresis (ii) Dialysis **[2 marks]**

Q. 12 Explain the following: (i) Why is the atomic size of noble gases comparatively larger? (ii) Being almost equal in electronegativity, Nitrogen forms hydrogen bond while chlorine does not. **[2 marks]**

Q. 13 Justify with reasons: (i) $[NiCl_4]^{2-}$ is paramagnetic while $[Ni(CO)_4]$ is diamagnetic, although both are tetrahedral. (ii) $[Fe(H_2O)_6]^{3+}$ is stronger paramagnetic while $[Fe(CN)_6]^{3-}$ is weaker paramagnetic. **[2 marks]**

Q. 14 What are polypeptides? Explain with example. **[2 marks]**

Section C

Short Answer Questions — 3 marks each

Q. 15 The column of a solution of 0.05 mol L^{-1} NaOH has diameter 2.0 cm and length 100 cm. The resistance of the column of solution is 5.55×10^3 ohm. Calculate its resistivity, conductivity and molar conductivity. (1+1+1=3) **[3 marks]**

Q. 16 Write short notes on the following: (i) Tyndall effect (ii) Brownian movement (iii) Coagulation. (1+1+1=3) **[3 marks]**

Q. 17 Write the structural formula of fructose. How is it different from the structure of glucose? (1½+1½=3) **[3 marks]**

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Q. 18 Give a chemical test for differentiating the following couple of compounds: (i) Secondary and tertiary amines (ii) Methyl amine and dimethyl amine (iii) Ethylamine and aniline. (1+1+1=3) **[3 marks]**

Section D

Short Answer Questions — 4 marks each

Q. 19 What do you understand by elevation in boiling point? Boiling point of a liquid is 350 K. On dissolving 2.0 g of a non-volatile solute in 100 g liquid, the boiling point of solution becomes 350.50 K. Calculate the molar mass of the solute. Kb for the liquid is 2.50 K kg mol^{-1}. (1+3=4) **[4 marks]**

Q. 20 What do you understand by order of reaction? What is the difference between the first order and zero order reaction? Following data was obtained on first order thermal decomposition of $N_2O_5(g)$ at fixed volume: $2N_2O_5(g) \rightarrow 2N_2O_4(g) + O_2(g)$. S. No. 1: Time 0 s, Total pressure 0.5 atm; S. No. 2: Time 100 s, Total pressure 0.512 atm. Calculate the velocity constant. (1+1+2=4) **[4 marks]**

Q. 21 What are transition elements? Write the names and electronic configuration of the elements of the first transition series. Transition metals and their maximum compounds are paramagnetic. Explain. (1+1+2=4) **[4 marks]**

Q. 22 Write the formulae of the following coordination compounds: (i) Tetracarbonyl nickel(0) (ii) Dichlorobis(ethan-1,2-diamine)cobalt(III) chloride (iii) Pentamine carbonato cobalt(III) chloride (iv) Tetramine aquachlorido cobalt(III) chloride. (1+1+1+1=4) **[4 marks]**

Section E

Long Answer Questions — 5 marks each (attempt any one option in each question)

Q. 23 What happens when (give chemical equations only): (i) Concentrated H_2SO_4 is added in calcium fluoride? (ii) SO_3 is passed in water? (iii) Calcium hydroxide reacts with ammonium chloride? (iv) Concentrated sulphuric acid and copper metal is heated? (v) Chlorine gas is passed in cold caustic soda solution? (1+1+1+1+1=5) **[5 marks]**

— OR —

Describe the method of preparation of dinitrogen in the laboratory and also write the chemical equations of the reactions. Write the reactions of dinitrogen with (i) oxygen and (ii) magnesium at high temperature. What is its reaction with hydrogen in presence of catalyst at 773 K temperature? (2+1+1+1=5)

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Q. 24 Write IUPAC names of the following: (i) $CH_3-CH=CH-CH(CH_3)Br$ (ii) $(CH_3)_3-C-CH_2(Br)$ (iii) $CH_3CH_2CH_2-CH(C(CH_3)_3)-CH(I)CH_2CH_3$ (iv) $(CH_3)_2CBrCH_2CH_3$ (v) $(CH_3)_3CCl$ (1+1+1+1+1=5) **[5 marks]**

— OR —

Explain with reasons: (i) Sulphuric acid is not used in the reaction of alcohol and KI. (ii) Haloalkanes form alkyl cyanide as chief product on reaction with KCN, while isocyanide as chief product on reaction with AgCN. (iii) Although chlorine is an electron withdrawing group, even then it is ortho- and para-directing in aromatic electrophilic substitution reactions. (1+2+2=5)

Q. 25 Give chemical equation for the following reactions: (i) Oxidation of propan-1-ol with alkaline $KMnO_4$ (ii) Reaction of phenol with chloroform in presence of aqueous NaOH (iii) Reaction of phenol with dilute HNO_3 (iv) Reaction of hydrogen iodide with methoxybenzene (v) Formation of propoxypropane from propan-1-ol (1+1+1+1+1=5) **[5 marks]**

— OR —

How can the following changes be done? (Give chemical equations only) (i) Propan-1-ol from ethyl magnesium chloride (ii) 2-methylpropan-2-ol from methyl magnesium bromide (iii) Benzoic acid from benzyl alcohol (iv) Picric acid from phenol (v) Dehydration of propan-2-ol (1+1+1+1+1=5)

Q. 26 What happens when (Give chemical equations only): (i) Acetaldehyde reacts with dilute NaOH (ii) Acetone is heated with solid barium hydroxide (iii) Formaldehyde reacts with concentrated NaOH solution (iv) Acetic acid reacts with ethanol in the presence of H_2SO_4 (v) Acetaldehyde reacts with phenylhydrazine (1+1+1+1+1=5) **[5 marks]**

— OR —

Write short notes on the following: (i) Kolbe Electrolysis (ii) Aldol condensation (iii) Rosenmund reduction

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1. Q3: the source article gives option (C) as "3.465 × 10^{1} s"; corrected to "3.465 × 10^{-1} s" per the scanned original.
2. Q5: the structure is printed in the original as $CH_3-CH-CH-CH_3$ with –OH on the 2nd carbon and $–CH_3$ on the 3rd carbon; transcribed here as $CH_3-CH(OH)-CH(CH_3)-CH_3$.
3. Q7: "length of its core of unit cell" is as printed in the original (both Hindi and English sides); the standard wording is "edge". Reproduced as printed.
4. Q13: the source article splits this into two separate items; the scanned original shows it is one part with (i) and (ii) — combined here.
5. Q20: the equation is printed as $2N_2O_5(g) \rightarrow 2N_2O_4(g) + O_2(g)$ in the original (the NCERT form of this problem); reproduced as printed. The data table is taken from the scanned original.
6. Q21: "Transition metals and their maximum compounds are paramagnetic." is as printed in the original; reproduced as printed.
7. Q24: the source article garbles (i) and (iii); (i) is $CH_3-CH=CH-CH(CH_3)Br$ and (iii) is $CH_3CH_2CH_2-CH(C(CH_3)_3)-CH(I)CH_2CH_3$ (the tert-butyl group is printed below the chain, and the halogen is I, not Cl) per the scanned original. The text solutions PDF misreads (iii) as a chloroalkane and gives wrong names for (ii)–(iv); the structures are reproduced as printed and no names are given here.
8. Q25 and Q26: the source article truncates the (i)–(v) lists; the full lists are completed from the text solutions PDF and the scanned original.

Source (third-party transcription): https://collegedunia.com/articles/e-737-up-board-class-12-chemistry-question-paper-with-answer-key-march-4-code-347-bz

Cross-checked against: https://image-static.collegedunia.com/public/image/UP_Board_Class_12_Chemistry_Code_347_BZ_2023_6a91d9cb5b44b5b2a480531d0faeaa03.pdf

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