HP Board Class 12 2026 Chemistry Question Paper with Solutions

Time Allowed :3 Hours	**Maximum Marks :**60	**Total questions :**28

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper has 28 questions. All questions are compulsory.
2. Internal choices are given in some questions.
3. Answers should be brief and to the point.
4. Question Nos. 1 to 12 are MCQ (Multiple Choice Questions) carrying 1 mark each.
5. Question Nos. 13 to 19 are very short answer type questions carrying 2 marks each.
6. Question Nos. 20 to 24 are short answer type questions carrying 3 marks each.
7. Question No. 25 is case study based question and carries 4 marks.
8. Question Nos. 26 to 28 are long answer type questions carrying 5 marks each.
9. All questions given in Section A (Multiple Choice Questions) are to be answered in the OMR sheet of Answer Book only.

Section - A

1. Assertion (A): Reduction of 1 mole of Cu^{2+} ions requires 2 Faraday of charge.
Reason (R): 1 Faraday is equal to the charge of 1 mole of electrons.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

---

2. Assertion (A): The α-hydrogen atom in carbonyl compound is less acidic.

Reason (R): The anion formed after the loss of α-hydrogen atom is resonance stabilized.

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

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

(C) (A) is true but (R) is false.

(D) (A) is false but (R) is true.

---

3. Phosgene is:

(A) $CHCl_3$

(B) CF_2Cl_2

(C) $COCl_2$

(D) CHI_3

---

4. Which of the following reagent will not convert ethyl alcohol into ethyl chloride?

(A) PCl_5

(B) NaCl

(C) $SOCl_2$

(D) HCl / $ZnCl_2$

---

5. The IUPAC name of Formic acid is:

(A) Methanoic acid

(B) Ethanoic acid

(C) Ethanedioic acid

(D) Methandioic acid

---

6. Rate constant depends on:

(A) Temperature

(B) Time

(C) Initial concentration

(D) None of the above

---

7. Electronic configuration of a transition element is $[Ar]\,3d^5 4s^2$. What is its atomic number?

(A) 25

(B) 26

(C) 27

(D) 24

---

8. What of the following is the correct example of a solid solution in which the solute is a gas?

(A) Copper dissolved in gold

(B) Camphor in nitrogen gas

(C) Hydrogen in palladium

(D) All of the above

---

9. Which of the following statement is not correct about an inert electrode in a cell?

(A) It does not participate in the cell reaction

(B) It provides surface either for oxidation or for reduction reaction

(C) It provide surface for conduction of electrons

(D) It provide surface for redox reaction

---

10. Formula of rust is:

(A) $FeO{\cdot}xH_2O$

(B) $Fe_3O_4{\cdot}xH_2O$

(C) $Fe_2O_3 \cdot xH_2O$

(D) None of the above

---

11. Which is used to preserve biological specimens?

(A) Acetone

(B) Acetaldehyde

(C) Ethanol

(D) Formaldehyde

---

12. The correct IUPAC name for $CH_2 = CHCH_2NHCH_3$ is:

(A) Allylmethylamine

(B) 2-amino-1-propene

(C) 4-aminopent-1-ene

(D) N-methylprop-2-en-1-amine

Section - B

13. Discuss the nature of bonding in the following co-ordination entity on the basis of valence bond theory: $[CoF_6]^{3-}$.

---

14. (i) Convert Toluene to Benzaldehyde.

---

14. (ii) What happens when Anisole is treated with $CH_3Cl/\text{anhydrous } AlCl_3$?

---

15. (i) Write the reaction involved in Aldol condensation.

---

15. (ii) Predict the product of the given reaction: $CH_3COONa \xrightarrow[\Delta]{NaOH/CaO} ?$

---

16. (i) Write the function of enzyme invertase.

---

16. (ii) Draw the zwitterion structure.

---

17. Explain the working of dry cell with diagram.

---

18. Give the difference between molecularity and order of reaction.

---

19. Write a short note on Tollen's test.

Section - D

20. (i) Among HCl**,** HBr **and** HI**,** HI **is most reactive towards alcohols. Why?**

---

20. (ii) What is fermentation? How is ethanol obtained commercially? Give two uses of ethanol.

OR,

(i) Write the equation of Friedel Craft reaction.

(ii) Write short note on Reimer-Tiemann reaction.

21. (i) Draw the structure of α-D-$(+)$-Glucopyranose.

21. (ii) What is glycogen? How is it different from starch?

22. (i) Represent the galvanic cell in which the given reaction takes place:

$\mathrm{Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)}$

22. (ii) Calculate the equilibrium constant for the reaction

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

Given that $E^{\circ}_{\text{cell}} = 0.46\,\mathrm{V}$.

23(i). Define the order of reaction.

23(ii). The rate constants of a reaction at $500\ \mathrm{K}$ and $700\ \mathrm{K}$ are $0.025\ \mathrm{sec}^{-1}$ and $0.075\ \mathrm{sec}^{-1}$ respectively. Calculate the value of E_a and A.

24(i) Write IUPAC name of the complex $[Cr(NH_3)_5Cl]Cl_2$.

24(ii) $[Cr(NH_3)_6]^{3+}$ is paramagnetic while $[Ni(CN)_4]^{2-}$ is diamagnetic. Explain why.

Section - D

25. (Case Study Questions)

Depending on the molecules involved in controlling the rate of reaction, nucleophilic substitution reaction can be divided in two categories – nucleophilic unimolecular (S_N1) and nucleophilic bimolecular (S_N2). Alkyl halide reactivity towards S_N1 and S_N2 reactions depends on a number of variables, including steric hindrance, stability of the intermediate or transition state and solvent polarity. Primary alkyl halides, followed by secondary and tertiary alkyl halide are most favourable to the S_N2 reaction mechanism. In the case of S_N1 reactions, this order is reversible.

(i) Which of the following is most reactive towards nucleophilic substitution reaction?

(A) CH_3Cl

(B) $CH_2 = CHCl$

(C) $ClCH_2CH = CH_2$

(D) $CH_3CH = CHCl$

---

25. (ii) Isopropyl chloride undergoes hydrolysis by:

(A) S_N1 and S_N2 mechanism

(B) S_N1 mechanism

(C) S_N2 mechanism

(D) None of the above

---

25. (iii) Explain S_N1 and S_N2 reactions.

Section - E

26. (i) Draw the structure of p-Toluidine.

---

26. (ii) Write short note on ecocatalyst.

---

26. (iii) Arrange the following in increasing order of solubility in water: Aniline, ethanamine, 2-ethylbutanamine.

---

26. (iv) Arrange the following amines in the decreasing order of basic strength in gas phase: $C_2H_5NH_2$**,** $(C_2H_5)_2NH$**,** $(C_2H_5)_3N$ **and** NH_3**.**

---

27. (i) Define the colligative properties.

---

27. (ii) Calculate the mole fraction of ethylene glycol $(C_2H_6O_2)$ **in a solution containing** 20% **of** $C_2H_6O_2$ **by mass.**

---

27. (iii) Derive Raoult's law for non-volatile solutes and define vapour pressure.

---

28. (i) Write the name and atomic number of fourth lanthanoid.

---

28. (ii) Write a note on lanthanide contraction. Explain its consequences.

(iii) Calculate the magnetic moment of Fe^{2+} $[Fe = 26]$**.**

(iv) Draw the structure of chromate ion.
