

# 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.

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**2. Assertion (A): The  $\alpha$ -hydrogen atom in carbonyl compound is less acidic.**

**Reason (R): The anion formed after the loss of  $\alpha$ -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.

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**3. Phosgene is:**

(A)  $CHCl_3$

(B)  $CF_2Cl_2$

(C)  $COCl_2$

(D)  $CHI_3$

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

(A)  $PCl_5$

(B)  $NaCl$

(C)  $SOCl_2$

(D)  $HCl / ZnCl_2$

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**5. The IUPAC name of Formic acid is:**

(A) Methanoic acid

(B) Ethanoic acid

(C) Ethanedioic acid

(D) Methandioic acid

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**6. Rate constant depends on:**

- (A) Temperature
  - (B) Time
  - (C) Initial concentration
  - (D) None of the above
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**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
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**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
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**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 provides surface for conduction of electrons
  - (D) It provides surface for redox reaction
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**10. Formula of rust is:**

- (A)  $FeO \cdot xH_2O$
- (B)  $Fe_3O_4 \cdot xH_2O$

- (C)  $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$   
(D) None of the above
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**11. Which is used to preserve biological specimens?**

- (A) Acetone  
(B) Acetaldehyde  
(C) Ethanol  
(D) Formaldehyde
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**12. The correct IUPAC name for  $\text{CH}_2 = \text{CHCH}_2\text{NHCH}_3$  is:**

- (A) Allylmethylamine  
(B) 2-amino-1-propene  
(C) 4-aminopent-1-ene  
(D) N-methylprop-2-en-1-amine
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### Section - B

**13. Discuss the nature of bonding in the following co-ordination entity on the basis of valence bond theory:  $[\text{CoF}_6]^{3-}$ .**

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**14. (i) Convert Toluene to Benzaldehyde.**

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**14. (ii) What happens when Anisole is treated with  $\text{CH}_3\text{Cl}$ /anhydrous  $\text{AlCl}_3$ ?**

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

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15. (ii) Predict the product of the given reaction:  $\text{CH}_3\text{COONa} \xrightarrow[\Delta]{\text{NaOH/CaO}} ?$

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

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16. (ii) Draw the zwitterion structure.

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17. Explain the working of dry cell with diagram.

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

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

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#### Section - D

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

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

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OR,

(i) Write the equation of Friedel Craft reaction.

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

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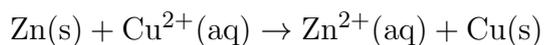
**21. (i) Draw the structure of  $\alpha$ -D-(+)-Glucopyranose.**

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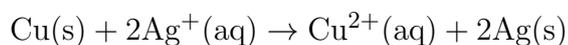
**21. (ii) What is glycogen? How is it different from starch?**

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



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



**Given that  $E_{\text{cell}}^{\circ} = 0.46 \text{ V}$ .**

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**23(i). Define the order of reaction.**

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

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**24(i) Write IUPAC name of the complex  $[\text{Cr}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ .**

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**24(ii)  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  is paramagnetic while  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic. Explain why.**

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## 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)  $\text{CH}_3\text{Cl}$
  - (B)  $\text{CH}_2 = \text{CHCl}$
  - (C)  $\text{ClCH}_2\text{CH} = \text{CH}_2$
  - (D)  $\text{CH}_3\text{CH} = \text{CHCl}$
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**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
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**25. (iii) Explain  $S_N1$  and  $S_N2$  reactions.**

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## Section - E

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

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**26. (ii) Write short note on cocatalyst.**

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

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**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  $NH_3$ .**

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**27. (i) Define the colligative properties.**

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**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.**

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

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

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

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

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**(iv) Draw the structure of chromate ion.**

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