CBSE Board
Class XII Chemistry
Sample paper - 8

Time: 3 Hrs Total Marks: 70

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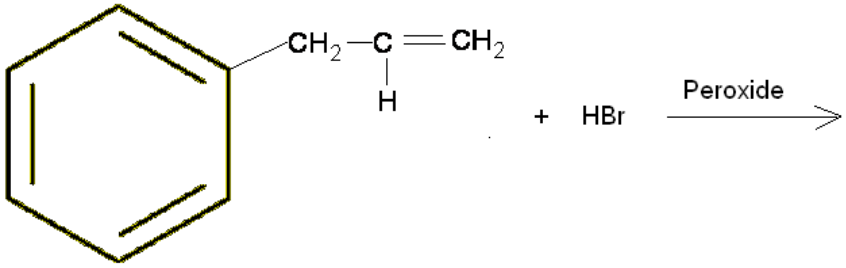
1. All questions are compulsory.
2. Question nos. **1 to 8** are very short answer questions and carry 1 mark each
3. Question nos. **9 to 18** are short answer questions and carry 2 marks each. Use of calculator is not permitted.
4. Question nos. **19 to 27** are also short answer questions and carry 3 marks each
5. Question nos**. 28 to 30** are long answer questions and carry 5 marks each
6. Use log tables if necessary, use of calculators is not allowed.

Q1: What is the type of linkage responsible for the formation of primary structure of proteins?

Q2: Give a chemical test to distinguish between benzaldehyde and acetophenone.

Q3: Write the product of the following reaction:



Q4: A solid has a cubic structure in which X atoms are located at the corners of the cube, Y atoms are at the body centre and O atoms are at all the face centres. What is the formula of the compound?

Q5: Explain why amorphous solids are isotropic.

Q6: Identify the reaction order for the reaction having the rate constant
$k = 1.3 \times 10^{-5}\ Lmol^{-1}s^{-1}$

Q7: For a reaction, A+ B → Product; the rate law is given by
Rate = $k\,[A]^{1/2}\,[B]^{3/2}$. What is the order of the reaction?

Q8: Predict the shape of the compound ClF_3

Q9:If NaCl is doped with 10^{-3} mol% of $SrCl_2$, what is the concentration of cationic vacancies?

Q10: Calculate the equilibrium constant, K for the reaction at 298 K:
$3Sn^{4+} + 2Cr \rightarrow 3Sn^{2+} + 2Cr^{3+}$; $E^{\theta} = 0.885$ V

Q11: Out of sodium chloride and barium chloride which will have a greater coagulation value for As_2S_3 sol? Why?

Q12: Give reasons:-
(a) True solutions do not exhibit Tyndall effect.
(b) Enthalpy of chemisorption is more than that of physisorption.

Q13: Give reasons: -
(a) PH_3 has lower boiling than NH_3. Why?
(b) H_3PO_2 acts as reducing agent.

Or

Give reasons: -
(a) Nitrogen exists as diatomic molecule, N_2, whereas phosphorus exists as a tetraatomic molecule P_4.
(b) Noble gases have low heat of vapourisation.

Q14: Complete the following chemical reactions: -
(a) $RCHO + H_2 \xrightarrow{Pd} ?$

(b) $CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_3 \xrightarrow[440\ K]{85\%\ H_3PO_4}$

Q15:Give equations involved in the following reactions: -
(a) Reimer – Tiemann reaction
(b) Kolbe's reaction

Q16: Convert –
(a) Propanoic acid to ethanamine
(b) Aniline to benzoic acid

Q17: Arrange the following in the increasing order of basic strength in gas phase:
$C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$, and NH_3
Give reason.

Q18:What happens when:

(a) White phosphorus is heated with concentrated NaOH solution in an inert atmosphere of CO_2

(b) PCl_5 is heated

Q19: The following data were obtained for the reaction:

$2\ NO\ (g) + Br_2\ (g) \longrightarrow 2\ NOBr\ (g)$

Experiment	[NO]	[Br_2]	Initial rate (mol L^{-1} min^{-1})
I	0.10	0.10	1.3×10^{-6}
II	0.20	0.10	5.2×10^{-6}
III	0.20	0.30	1.56×10^{-5}

Determine (a) the order of reaction with respect to NO and Br_2

(b) the rate law and

(c) rate constant

Q20: The molar conductivity of 0.025 $molL^{-1}$ methanoic acid is 46.1$Scm^2\ mol^{-1}$. Calculate its degree of dissociation and dissociation constant. Given $\lambda^\circ_{(H^+)}$ = 349.6 S $cm^2\ mol^{-1}$ and $\lambda^\circ_{(HCOO^-)}$ = 54.6 S $cm^2\ mol^{-1}$.

Q21:

(a) Name the method used for refining of

i. Nickel

ii. Titanium

(b) The extraction of Au by leaching with NaCN involves both oxidation and reduction. Justify giving equations.

Q 22:

(a) Out of the following which hydride has the largest bond angle? Why?

H_2O, H_2S, H_2Se and H_2Te

(b) Which oxide of sulphur acts as oxidising as well as reducing agent?

(c) SO_3 has zero dipole moment. Why?

Q23: Using valence bond theory, explain the geometry and magnetic behaviour of pentacarbonyliron (0).

Q24: Explain the following terms with suitable examples:

(a) cationic detergents
(b) anionic detergents and
(c) non-ionic detergents

Q25: Is $(—CH_2—CH(C_6H_5—)_n$ a homopolymer or a copolymer? Write the name and formula of its monomer/s. Is it an addition polymer or a condensation polymer?

Q26: What happens when D – glucose is treated with the following reagents?

(a) HI
(b) Bromine water
(c) HNO_3

Q27: How will you bring the following conversions?

(a) Toluene to benzyl alcohol
(b) Ethanol to ethyl fluoride
(c) Benzene to biphenyl

Or

(a) $C_6H_5O^-Na^+ + C_2H_5Cl \longrightarrow$

(b) $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{Peroxide}}$

(c) $CH_3CH = C(CH_3)_2 + HBr \longrightarrow$

Q28: 45 g of ethylene glycol ($C_2H_6O_2$) is mixed with 600 g of water. Calculate

(a) Freezing point depression
(b) The freezing point of the solution
(K_f for water = 1.86 K kg mol^{-1})

Or

Calculate the osmotic pressure of a solution obtained by mixing 100mL of 3.4 percent solution of urea (mol mass = 60) and 100mL of 1.6 percent solution of cane sugar (mol mass = 342) at 293 K. R = 0.083 L bar mol^{-1} K^{-1}

Q29:

(a) Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.
(b) Actinoid contraction is greater from element to element than lanthanoid contraction. Why?
(c) Which is the last element in the series of the actinoids? Write the electronic configuration of this element. Comment on the possible oxidation state of this element.
(d) Which out of $Lu(OH)_3$ and $La(OH)_3$ more basic and why?

Or

(a) Why do Zr and Hf exhibit similar properties?

(b) What is the basic difference between the electronic configuration of transition and inner transition elements?

(c) What is meant by 'disproportionation'? Give one example.

Q30: An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) on dehydration gives but – 1 –ene. Write equations for the reactions involved.

Or

(a) Arrange the following compounds in increasing order of their property as indicated:

Benzoic acid, 4 – Nitro benzoic acid, 3, 4 – Dinitrobenzoic acid,

4 – Methoxybenzoic acid (acid strength)

(b) Give simple chemical tests to distinguish between the following pairs of compounds.

i. Propanal and Propanone

ii. Benzoic acid and Ethyl benzoate