

CLASS XII

GUESS PAPER-01

CHEMISTRY


MM : 70

TIME : 3 Hrs

General Instructions:

- (i) All questions are compulsory.
- (ii) Marks for each question are indicated against it.
- (iii) Question numbers **1 to 5** are very short-answer questions and carry **1** mark each.
- (iv) Question numbers **5 to 10** are short-answer questions and carry **2** marks each.
- (v) Question numbers **11 to 22** are also short-answer questions and carry **3** marks each.
- (vi) Question number **23** is value based question and carries **4** marks.
- (vii) Question numbers **24 to 26** are long-answer questions and carry **5** marks each.

1. Why is ICl more reactive than I₂ ? [1]
2. Write the structure of an isomer of C₄H₉Br which is most reactive towards S_N1 reaction. [1]
3. Why is a colloidal sol stable ? [1]
4. Why are stoichiometric defects also known as intrinsic defects ? [1]
5. Write the structure of Prop-2-en-1-amine. [1]
6. What type of battery is Lead storage battery ? Write the cathode and anode reactions and the overall cell reaction occurring in the operation of a lead storage battery. [2]
7. Define : [2]
 - (i) Effective collisions
 - (ii) Order of reaction
8. Give Reasons : [2]
 - (i) MnO is basic whereas Mn₂O₇ is acidic in nature.
 - (ii) Transition metals form a large number of complex compounds.
9. i) Write the IUPAC name of [Co(NH₃)₅(NO₂)](NO₃)₂ [2]
ii) Identify the type of isomerism exhibited by [Co(NH₃)₅Cl]SO₄ .
10. Write the chemical equations involved in the following reactions : [2]
 - (i) Reimer Tiemann reaction
 - (ii) Friedel Crafts alkylation of Anisole
11. (i) An element crystallises in BCC lattice with edge length of 500 pm and density 7.5 g cm⁻³. [2+1]
Calculate the atomic mass of the element.

- (ii) Why are crystalline solids anisotropic ?
12. Differentiate between the following : [3]
- Lyophilic and Lyophobic sols
 - Chemisorption and Physisorption.
 - Homogeneous and Heterogeneous catalysis.
13. Calculate the Cell emf at 298 K for the following cell : [3]
- $$2 \text{Cr}(s) + 3\text{Fe}^{2+}(0.01 \text{ M}) \longrightarrow 2\text{Cr}^{3+}(0.01 \text{ M}) + 3\text{Fe}(s)$$
- [Given $E^{\circ}_{\text{Cr}^{3+}/\text{Cr}} = -0.74 \text{ V}$; $E^{\circ}_{\text{Fe}^{2+}/\text{Fe}} = -0.44 \text{ V}$; $F = 96500 \text{ C mol}^{-1}$]
14. A first order reaction takes 30 minutes for 50% completion. Calculate the time required for 90% completion of this reaction. [log 2=0.3010] [3]
15. Answer the following : (**Any Three**) [3]
- What is the role of coke in the extraction of iron from its oxide ?
 - Name the method of refining of Germanium.
 - State the Principle of Vapour phase refining.
 - What is the role of depressant(NaCN) in the Froth floatation process ?
16. (i) Write the Hybridisation, Geometry, Magnetism and Spin of $[\text{Co}(\text{NH}_3)_6]^{3+}$ [2+1]
(At.no. of Co = 27)
- (ii) Why is complex $[\text{Co}(\text{en})_3]^{3+}$ more stable than $[\text{CoF}_6]^{3-}$?
17. (i) Complete the reaction : $\text{Cr}_2\text{O}_7^{2-} + 14 \text{H}^+ + 6\text{Fe}^{2+} \longrightarrow$ [1+2]
- (ii) How will you prepare $\text{K}_2\text{Cr}_2\text{O}_7$ from FeCr_2O_4 ? Write all the reactions. [3]
18. How will you convert the following : [3]
- Propene to Propan-1-ol
 - Aniline to Chlorobenzene
 - Chlorobenzene to Toluene
- OR**
- Complete the following reactions:
- (i) $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)_2 + \text{HBr} \longrightarrow$
- (ii) $\text{C}_6\text{H}_5\text{N}_2\text{Cl} + \text{H}_3\text{PO}_2 + \text{H}_2\text{O} \longrightarrow$
- (iii)  + HI \longrightarrow
19. An organic compound **A** having molecular formula $\text{C}_6\text{H}_6\text{O}$ gives a characteristic colour with aqueous FeCl_3 solution. **A** on treatment with CO_2 and NaOH under pressure gives **B** which on acidification gives a compound **C**. The compound **C** reacts with acetyl chloride to form a popular pain reliever. Deduce the structures of **A**, **B** and **C**. [3]
20. (i) Write the Coupling reaction with Aniline . [3]
- $\text{C}_6\text{H}_5\text{CONH}_2 + \text{Br}_2 + \text{KOH} \longrightarrow$
 - $\text{C}_6\text{H}_5\text{NH}_2 + (\text{CH}_3\text{CO})_2\text{O}$ (Pyridine) \longrightarrow

21. Answer the following : **(Any Three)** [3]
- Write one difference between DNA and RNA.
 - Write the name of disease caused by deficiency of Vitamin B12.
 - What happens when Glucose gets oxidized with a mild oxidizing agent like Bromine water ?
 - What are reducing sugars ?
22. a) Differentiate between Homopolymer and Copolymer with an example. [2+1]
- b) Write the names and structures of the monomers of Bakelite.
- *23. Varsha's grandfather is a diabetic patient but is fond of sweets. He always likes to take tea or milk with sugar. [4]
- Varsha being a science student used artificial sweetener of low calorie in his tea or milk. Now his sugar level is in control and he remains happy.
- Which artificial sweetener did Varsha use in her grandfather's tea or milk ?
 - Why do these not cause any harm to diabetic patients ?
 - What values do you observe in Varsha's action ?
 - Name the artificial sweetener which is stable at cooking temperature .
24. a) Account for the following : [3+2]
- H_3PO_2 and H_3PO_3 act as good reducing agents while H_3PO_4 does not.
 - On addition of ozone gas to KI solution, violet vapours are obtained.
 - ClF_3 is known but FCl_3 is not known.
- b) Complete the following equations :
- $\text{Cu} + \text{HNO}_3(\text{conc.}) \longrightarrow$
 - $\text{PCl}_5 + \text{CH}_3\text{COOH} \longrightarrow$
- OR**
- a) Give the balanced chemical equation for the following:
- Chlorine gas reacts with hot and conc. NaOH.
 - Colourless gas with rotten fish smell which is used in Holme's signals reacts with CuSO_4
 - PCl_3 fumes in moist air.
- b) Draw the structures of the following molecules:
- XeO_3
 - HOClO_2
25. a) Give chemical tests to distinguish between the following: [2+3]
- Propanal and Propanone.
 - Benzoic acid and Phenol
- b) How will you convert the following :
- Benzoic acid to Benzamide.
 - Sodium benzoate to Benzene .
 - Ethanal to But-2-enal.
- OR**

a) Illustrate the given name reactions :

[2+3]

(i) Hell Volhard Zelinsky reaction. (ii) Clemmensen reduction

b) How will you convert the following :

i) Toluene to Benzoic acid.

ii) Ethanoic acid to Acetyl chloride .

iii) Methanal to Methanol.

26.a) Explain why a solution of Chloroform and Acetone shows negative deviation from Raoult's law.

[2+3]

b) 18 g of Glucose $C_6H_{12}O_6$ (Molar mass = 180 g mol^{-1}) is dissolved in 1 Kg of water in a pan. At what temperature will this solution boil ? (K_b for water = $0.52 \text{ K kg mol}^{-1}$; Boiling point of water = 373.15 K)

OR

a) Write two differences between a solution showing positive deviation and a solution showing negative deviation.

b) Calculate the temperature at which a solution containing 54 g of glucose ($C_6H_{12}O_6$) in 250 g of water will freeze. (K_f for water = $1.86 \text{ K kg mol}^{-1}$)
