

CLASS XII

GUESS PAPER-43

CHEMISTRY


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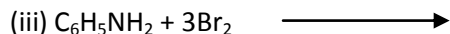
TIME : 3 Hrs

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 the defects of crystalline solids are called thermodynamic defects ? [1]
2. Why are medicines more effective in colloidal state ? [1]
3. Write the structure of an isomer of C_4H_9Br which is most reactive towards S_N1 reaction. [1]
4. Why is H_2O a liquid and H_2S a gas ? [1]
5. Write the IUPAC name of $C_6H_5CH_2NH_2$. [1]
6. What type of battery is Dry cell ? Write the overall reaction occurring in the Dry cell. [2]
7. Define : [2]
 - (i) Effective collisions
 - (ii) Molecularity of a reaction
8. Give Reasons : [2]
 - (i) Cu^{2+} salts are coloured while Zn^{2+} salts are white.
 - (ii) Transition metals show variable oxidation states.
9. i) Write the IUPAC name of $[CrCl_2(en)_2]Cl$ [2]
 - ii) On the basis of Crystal field theory, write the electronic configuration for d^4 ion if $\Delta_0 > P$.
10. Write the chemical equations involved in the following reactions : [2]
 - (i) Reimer Tiemann reaction
 - (ii) Friedel Crafts acylation of Anisole
11. (i) An element with density 10 g cm^{-3} forms a cubic cell with edge length $3 \times 10^{-8} \text{ cm}$. What is the nature of cubic unit cell if atomic mass of the element is 81 g mol^{-1} ? [2+1]

- (ii) Which stoichiometric defect lowers the density of a crystal ?
12. Differentiate between the following : [3]
- Multimolecular and Macromolecular colloid.
 - Chemisorption and Physisorption.
 - Homogeneous and Heterogeneous catalysis.
13. Calculate the Cell emf at 298 K for the following cell : [3]
- $$\text{Al(s)} \mid \text{Al}^{3+} (0.001 \text{ M}) \parallel \text{Ni}^{2+} (0.50 \text{ M}) \mid \text{Ni(s)}$$
- [Given $E^{\circ}_{\text{Ni}^{2+}/\text{Ni}} = -0.25 \text{ V}$; $E^{\circ}_{\text{Al}^{3+}/\text{Al}} = -1.66 \text{ V}$; $\text{Log } 8 = 0.9031$]
14. The rate constant of a first order reaction increases from 2×10^{-2} to 8×10^{-2} when the temperature changes from 300 K to 320 K. Calculate the energy of activation (E_a). [3]
- [Given $\text{Log } 2 = 0.3010$, $\text{Log } 3 = 0.4771$, $\text{Log } 4 = 0.6021$, $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]
15. Answer the following : (**Any Three**) [3]
- What is the role of cryolite in the Electrometallurgy of Aluminium ?
 - Name the method of refining of Tin.
 - State the Principle of Zone refining.
 - What is the role of depressant (NaCN) in the Froth floatation process ?
16. (i) Write the Hybridisation, Geometry, Magnetism and Spin of $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ [2+1]
(At.no. of Fe = 26)
- (ii) What is an ambidentate ligand? Give example.
17. (i) Complete the reaction : $\text{Cr}_2\text{O}_7^{2-} + 14 \text{H}^+ + 6\text{e}^- \longrightarrow$ [1+2]
- (ii) How will you prepare KMnO_4 from MnO_2 ? Write all the reactions.
18. How will you convert the following : [3]
- Propene to Propan-1-ol
 - Aniline to Chlorobenzene
 - Benzene to Diphenyl
- 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 Phenol. [3]
- (ii) $\text{C}_6\text{H}_5\text{CONH}_2 + \text{Br}_2 + \text{KOH} \longrightarrow$



21.a) Define Thermoplastic and Thermosetting polymer with an example for each. [2+1]

b) Write the names and structures of the monomers of Buna-S.

22. Answer the following : (Any Three) [3]

(i) Write one difference between Nucleotide and Nucleoside.

(ii) Write the name of disease caused by deficiency of Vitamin C.

(iii) What happens when Glucose gets oxidized with a mild oxidizing agent like Bromine water ?

(iv) What are reducing sugars ?

*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.

(i) Which artificial sweetener did Varsha use in her grandfather's tea or milk ?

(ii) Why do these not cause any harm to diabetic patients ?

(iii) What values do you observe in Varsha's action ?

(iv) Name the artificial sweetener which is stable at cooking temperature .

24. a) Give chemical tests to distinguish between the following: [2+3]

(i) Pentan-2-one and Pentan-3-one.

(ii) Benzoic acid and Phenol

b) How will you convert the following :

i) Benzoyl chloride to Benzaldehyde.

ii) Sodium benzoate to Benzene .

iii) Ethanal to But-2-enal.

OR

a) Illustrate the given name reactions :

(i) Hell Volhard Zelinsky reaction. (ii) Rosenmund Reduction.

b) How will you convert the following :

i) Benzaldehyde to Benzyl alcohol.

ii) Benzene to Benzaldehyde.

iii) Benzoic acid to m-Nitrobenzoic acid.

25. a) Account for the following : [3+2]

i) PCl_5 is known but NCl_5 is not known.

ii) Noble gases have low boiling points.

iii) H_2S is less acidic than H_2Te .

b) Complete the following equations :



OR

- a) Give the balanced chemical equation for the following:
- (i) Chlorine gas reacts with cold and dilute NaOH.
 - (ii) Colourless gas with rotten fish smell which is used in Holme's signals reacts with HgCl_2 .
 - (iii) PCl_3 fumes in moist air.
- b) Draw the structures of the following molecules:
- (i) XeF_4
 - (ii) $\text{H}_2\text{S}_2\text{O}_7$
26. a) Define Azeotrope. What type of azeotrope is formed by positive deviation from Raoult's law. Give an example. [2+3]
- b) When 1.5 g of a non-volatile solute was dissolved in 90 g of benzene, the boiling point of benzene raised from 353.23 K to 353.93 K. Calculate the molar mass of solute. (K_b for benzene = 2.52 kg mol^{-1})

OR

- a) Write two differences between a solution showing positive deviation and a solution showing negative deviation.
- b) A 1.00 molal aqueous solution of trichloroacetic acid (CCl_3COOH) is heated to its boiling point. This solution has a boiling point of 100.18°C . Determine the Van't Hoff factor for trichloroacetic acid (K_b for water = $0.512 \text{ K kg mol}^{-1}$)
