

Guess Paper – 2014
Class – XII
Subject – Chemistry

General Instructions:

- (i) All questions are compulsory.
 (ii) Marks for each question are indicated against it.
 (iii) Question numbers **1 to 8** are very short-answer questions and carry **1** mark each.
 (iv) Question numbers **9 to 18** are short-answer questions and carry **2** marks each.
 (v) Question numbers **19 to 27** are also short-answer questions and carry **3** marks each.
 (vi) Question numbers **28 to 30** are long-answer questions and carry **5** marks each.
 (vii) Use Log Tables, if necessary, Use of calculators is **not** allowed.

1. What are f- centres ? [1]
2. Why is adsorption always exothermic ? [1]
3. What is the role of silica in the metallurgy of copper ? [1]
4. How will you obtain SO₂ from Sulphuric acid ? Write the equation. [1]
5. Write the IUPAC name of K₂[Ni(CN)₄]. [1]
6. Write the Fittig reaction. [1]
7. Write the equation for the preparation of Phenol from Chlorobenzene. [1]
8. Why are aldehydes more reactive than ketones ? [1]
9. State the following : [2]
 - a) Henry's law about partial pressure of a gas in a mixture.
 - b) Raoult's law in its general form with reference to solutions.
10. Calculate the emf of the given cell at 25°C : [2]
 $Zn(s) | Zn^{2+} (0.0004 M) || Cd^{2+} (0.2 M) | Cd(s)$
 E° values at 25°C : $Zn^{2+}/Zn = -0.763 V$, $Cd^{2+}/Cd = -0.403 V$
 $F = 96500 C$; $R = 8.314 J K^{-1} mol^{-1}$
11. Name the principal ore of Aluminium. Explain the significance of leaching in the [2]

extraction of Aluminium.

OR

Explain the Hall-Heroult process with diagram.

- 12.a) Name the following : [2]
 i) A poisonous gas which can be prepared from chlorine gas.
 ii) A gas which has fishy odour.
 b) Why does PCl_3 fume in moisture ?
13. Give reasons for the following observations : [2]
 a) The enthalpy of atomization of transition metals is high.
 b) Transition metals generally form coloured compounds.
14. Write the stereochemistry and magnetic behaviour of the following: [2]
 (At.nos. Mn = 25, Co = 27)
 (i) $\text{K}_4[\text{Mn}(\text{CN})_6]$
 (ii) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
15. Complete the reaction : [2]
 a) $\text{C}_2\text{H}_5\text{CONH}_2 + \text{Br}_2 + \text{NaOH} \rightarrow$
 b) $\text{CH}_3\text{NH}_2 + \text{C}_6\text{H}_5\text{COCl} \rightarrow$
16. Account for the following : [2]
 a) Lower aliphatic amines are soluble in water.
 b) Aromatic amines are weaker bases than ammonia.
17. What happens when Glucose is treated with HNO_3 and HCN ? Write the equations. [2]
18. What are essential and non-essential amino acids ? Give one example of each type. [2]
19. What is a Dry cell ? Explain its working with a well labelled diagram and reactions. [3]
20. a) What are Lyophilic and Lyophobic sols ? Give one example of each type. [2+1]
 b) What is observed when a beam of light is passed through a colloidal sol ?
21. a) Complete the reaction : $\text{I}^- + \text{MnO}_4^- + \text{H}^+ \rightarrow$ [1+2]

- b) How will you prepare Potassium dichromate from Chromite ore. Write all the reactions.
22. Calculate the mass of Ascorbic acid ($C_6H_8O_6$) to be dissolved in 75 g of Acetic acid to lower its melting point by $1.5^{\circ}C$ ($K_f = 3.9 K \text{ kg mol}^{-1}$) [3]
- OR**
- 45 g of Ethylene glycol ($C_2H_6O_2$) is mixed with 600 g of water. Calculate (a) the freezing point depression and (b) the freezing point of the solution.
23. a) Write the structure 1-chloro-4-ethylcyclohexane. [1+2]
 b) Why are haloarenes less reactive towards nucleophilic substitution reactions ?
24. a) How would you obtain : [3]
 i) Propan-2-ol from Ethanal
 ii) Benzene from Phenol
 b) Write the Williamson ether synthesis.
25. a) Name the monomers of Bakelite and PVC. [3]
 b) Give an example of Copolymerisation.
 c) What is the significance of 6,6 in Nylon-6,6 ?
- *26. Sheela, a housewife was observing that she was gaining weight. Her friends advised her to avoid sugar, sweets and potato. At the same time her crawling child too was often falling sick, she was very worried. [3]
 a) Suggest an alternative of sugar to Sheela.
 b) Why do you think her child was falling sick ? Give a few suggestions.
 c) Chloramphenicol, a broad spectrum antibiotic is used to cure which diseases ?
27. An element has a BCC structure with a cell edge of 288 pm. The density of the element is 7.2 g/cm^3 . How many atoms are present in 208 g of the element ? [3]
28. a) What do you understand by rate law and rate constant of a reaction. For a reaction $A + B \rightarrow P$, the rate law is given by $r = k [A]^{1/2} [B]^2$. What is the order of this reaction ? [2+3]
 b) The decomposition of NH_3 on platinum surface is zero order reaction. What are the rates of production of N_2 and H_2 if $k = 2.5 \times 10^{-4} \text{ mol}^{-1} \text{ L s}^{-1}$?

OR

a) Explain the following :

- i) Molecularity of a reaction
- ii) Activation energy

b) The thermal decomposition of HCO_2H is a first order reaction with a rate constant of $2.4 \times 10^{-3} \text{ s}^{-1}$ at a certain temperature. Calculate how long will it take for three fourths of initial quantity of HCO_2H to decompose. ($\log 0.25 = -0.6021$)

29. (a) Complete the following chemical reaction equations: [2+3]

- (i) $\text{P}_4 + \text{SO}_2\text{Cl}_2 \rightarrow$
- (ii) $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow$

(b) Account for the following:

- (i) The acidic strength decreases in the order $\text{HCl} > \text{H}_2\text{S} > \text{PH}_3$
- (ii) Tendency to form pentahalides decreases down the group in group 15 of the periodic table.
- (iii) Helium is used in filling balloons for meteorological observations.

OR

(a) Complete the following chemical equations:

- (i) $\text{NaOH} + \text{Cl}_2 \rightarrow$
(hot and conc.)
- (ii) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow$

(b) Draw the structures of the following molecules:

- (i) H_3PO_2
- (ii) $\text{H}_2\text{S}_2\text{O}_7$
- (iii) Why is the reaction of hot concentrated NaOH with Cl_2 a disproportionation reaction ?

30. a) Give simple chemical tests to distinguish between the following pairs of compounds : [2+3]

- i) Phenol and Benzoic acid
- ii) Acetophenone and Benzaldehyde

b) An Organic compound 'A' (Molecular formula $\text{C}_8\text{H}_{16}\text{O}_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid 'B' and an Alcohol 'C'. Oxidation of 'C'

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with chromic acid produced 'B'. 'C' on dehydration gives But-1-ene. Identify A, B and C and write all the reactions involved .

OR

- a) Illustrate the following name reactions –
- Cannizzaro reaction
 - Decarboxylation
- b) How will convert the following :
- Benzoic acid to Benzamide
 - Benzene to Benzaldehyde
 - Propanal to Butanone



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