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. Define 'peptization'. [1]

2.Give the IUPAC name of $[Cr(H_2O)_5Cl]Cl_2$. [1]

3. Draw the structure of 4-chloropentan-2-one. [1]

4. Explain what is meant by peptide linkage with example. [1]

5.Why is white phosphorus more reactive than red phosphorus ? [1]

6. Why does NH_3 form hydrogen bond while PH_3 does not ? [1]

7.Write the Reimer Tiemann reaction. [1]

8.A first order reaction is found to have a rate constant k = 5.5 x 10^{-14} s^{-1}.Find the half life of the reaction. [1]

9. Copper crystallises with face centred cubic unit cell. If the radius of copper atom is 127.8 pm, calculate the density of copper metal. [2]
(Atomic mass of Cu = 63.5 u and Avogadro's number N_A = 6.02 x $10^{23}mol^{-1}$)

10.Differentiate between Frenkel and Schottky defects. [2]

11.Calculate the emf of the cell in which the following reaction takes place : [2]
$Ni(s) + 2\ Ag^+\ (0.002M) \longrightarrow Ni^{2+}(0.160M) + 2Ag(s)$
Given E^0_{cell} = 1.05 V

12.The rate constant for a first order reaction is 60 s^{-1}.How much time will it take to [2]

reduce the concentration of the reactant to 1/10th of its initial value ?

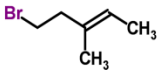
13. Express the relation among cell constant, resistance of the solution in the cell and conductivity of the solution.How is molar conductivity of a solution related to its conductivity? [2]

OR

How much Copper is deposited on the cathode of an electrolytic cell if a current of 5 amperes is passed through a solution of copper sulphate for 45 minutes ? (Atomic mass of Cu = 63.5 g mol^{-1} and 1 F = 96500 C mol^{-1})

14.Explain why $[Cr(NH_3)_6]^{3+}$ is paramagnetic while $[Ni(CN)_4]^{2-}$ is diamagnetic. [2]

15.a) A solution of KOH hydrolyses $CH_3CHClCH_2CH_3$ and $CH_3CH_2CH_2CH_2Cl$. [2]
Which one of these is more easily hydrolysed ? Give reason.



b) Give the IUPAC name of

16.a) How will you convert Aniline to Chlorobenzene ?Write all the steps involved. [2]
b) Haloalkanes easily dissolve in organic solvents.Why ?

17. Complete the following reaction equations: [2]
a) $C_6H_5N_2Cl + H_3PO_2 + H_2O \rightarrow$
b) $C_6H_5NH_2 + Br_2\,(aq.) \rightarrow$

18.a) Arrange the given compounds in an increasing order of their solubility in water : [2]
$C_6H_5NH_2$, $(C_2H_5)_2H$, $C_2H_5NH_2$
b) Write the chemical test to distinguish between Aniline and Phenol.

*19.Tantu and Bantu are good friends.They are horticulturists and grow *kninnow* (a citrus crop) [3] in Abohar in southern Punjab.Tantu wanted to spray his crop with a fungicide. Bantu advised him to use a safe copper based fungicide.He tells Tantu to spray his crop with Bordeaux mixture[$CuSO_4 + Ca(OH)_2$].Tantu took some water in a galvanized iron bucket to dissolve $CuSO_4$ but Bantu stopped him from doing so. Answer the following questions :
a) Why did Bantu stop Tantu from dissolving $CuSO_4$ in Iron bucket ?
b) Suggest an alternative correct procedure to Tantu.
c) What are the values associated with Bantu's advise to Tantu ?

20.Write short notes on the following : [3]
a) Shape selective catalysis
b) Electrophoresis
c) Emulsions

21. Describe the principle behind each of the following processes: [3]

a) Vapour phase refining of Titanium metal.
b) Froth floatation method.
c) Hall-Heroult process.

22. a) Draw the structures of the following molecules: [3]
(i) $H_4P_2O_5$
(ii) BrF_3
b) Despite lower value of its electron gain enthalpy with negative sign,why is fluorine (F_2) a stronger oxidising agent than Cl_2 ?

OR

Explain the following observations :

a) Nitrogen is much less reactive than Phosphorus.
b) H_2S is more acidic than H_2O.
c) XeF_2 is a linear molecule without a bend.

23. a) What happens when chlorine gas is passed through a hot concentrated solution of NaOH ? Write the reaction. [3]
b) $HgCl_2 + PH_3 \rightarrow$
c) Why do noble gases have very low boiling points?

24. How would you obtain : [3]
a) Picric acid (2, 4, 6-trinitrophenol) from phenol,
b) 2-Methylpropene from 2-methylpropanol

25. Describe the following giving one example for each: [3]
a) Antibiotic
b) Food preservatives
c) Analgesics

26. a) Give the reaction for the formation of the following polymers: [2+1]
i) Teflon
ii) Nylon
b) Give one example each of Thermoplastic and Thermosetting polymer.

27. a) Write the main structural difference between DNA and RNA.Of the four bases, name those which are common to both DNA and RNA. [3]
b) Deficiency of which vitamin causes 'Beri beri' ? What are its symptoms ?

28. a) Differentiate between molarity and molality for a solution.How does a change in temperature influence their values? [5]

b) Calculate the freezing point of an aqueous solution containing10.50g of $MgBr_2$ in 200 g of water. (Molar mass of $MgBr_2$ = 184 g)
(K_f for water = 1.86 K kg mol^{-1})

OR

a) Define the terms osmosis and osmotic pressure. Is the osmotic pressure of a solution a colligative property? Explain.

b) Calculate the boiling point of a solution prepared by adding 15.00 g of NaCl to 250.0 g of water. (K_b for water = 0.512 K kg mol^{-1},Molar mass of NaCl = 58.44 g)

29. (a) Illustrate the following name reactions: [5]

(i) Cannizzaro's reaction

(ii) Clemmensen reduction

(b) How would you obtain the following:

(i) But-2-enal from Ethanal

(ii) 2-Hydroxypropanoic acid(Lactic acid) from Ethanal

(iii) Benzoic acid from Ethylbenzene

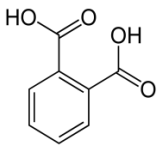
OR

(a) Give chemical tests to distinguish between the following:

(i) Benzoic acid and Ethyl benzoate

(ii) Benzaldehyde and Acetophenone

(b) Complete each synthesis by giving missing reagents or products in the following:

i)  ----------$SOCl_2$/Heat----------→

ii) C_6H_5COOH + PCl_5 ------Heat----------→

iii) CH_3COOH + NH_3 ----------→

30. a) Complete the following chemical equations: [5]

i) $MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow$

ii) $KMnO_4 \xrightarrow{\text{heated}}$

iii) $Cr_2O_4^{2-} + H_2S + H^+ \longrightarrow$

b) State reasons for the following:

i) Cu (I) ion is not stable in an aqueous solution.

ii) Unlike Cr^{3+},Mn^{3+}, Fe^{3+} and the subsequent other M^{3+} ions of the 3d series of elements, the 4d and the 5d series metals generally do not form stable cationic species.

OR

a) How will you prepare Potassium dichromate from Chromite ore.Write all the reactions.

b) How would you account for the following:

(i) Cr^{2+} is reducing in nature while with the same d-orbital configuration (d^4)
Mn^{3+} is an oxidising agent.

(ii) Zn,Cd & Hg are not regarded as Transition elements.

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THE JAIN INTERNATIONAL SCHOOL, BILASPUR

A JGI Institution

Paper Submitted by:

Name: **Tasneem Kausar**
Email: **tasneemkausarkhan@rediffmail.com**