Guess Paper – 2014
Class – XII
Subject – Chemistry

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General instructions:

All questions are compulsory.
Marks for each question are indicated against it.
Questions number 1to 8 are very short –answer questions, carrying 1 mark each. Answer these in one word or about one sentence each.
Questions number 9 to18 are short –answer questions, carrying 2 marks each. Answer these in about 30 words each.
Questions number19 to27 are short –answer questions, carrying 3 marks each. Answer these in about 40 words each.
Questions number28 to30 are long-answer questions of 5 marks each. Answer these in about 70 words each.
7 Use log tables if necessary. Use of calculators is not permitted

QUESTIONS:

1.Name a reagent required to oxidize primary alcohols into aldehydes in good yield.

2 Which bond of alcohol is cleaved during its reaction with carboxylic acid?

3. Primary amines have higher boiling points than tertiary amines. Why?

4.Why is nitrogen molecule less reactive than phosphorous molecule?

5 An electrolyte A_3B_2 is 25% ionized. What will be the van't Hoff factor?

6. The depression in freezing point of water observed for same amount of acetic acid, trichloroacetic acid and trifluoroacetic acid increases in above given order. Account to the observation.

7 NH_3 is strong ligand but NH_4^+ is not. Why?

8 Write IUPAC name of the complex compound: $[Co\ Cl_2\ (en)_2]\ NO_3$

9 When toluene is chlorinated:
(i) In presence of sunlight
(ii) In dark, in the presence of Lewis acid, two separate compounds are obtained. Write reactions.

10 Aldol condensation of a ketone in presence of dilute NaOH gives 4-Hydroxy-4-methyl pentan-2-one. Write the structure of ketone and its IUPAC name.

11 To prepare monobromo derivative of aniline, aniline is always acetylated. Why? Explain giving reason.

12. Give reason for the following giving chemical equation:
(i) Chlorine water acts as a bleaching agent.
(ii) Ozone gas leads to liberation of violet vapours when added to KI.

13 (a) Noble metals like gold do not dissolve in any of the mineral acids. Give a suitable reagent which can be used for this. Give the equation involved.
(b) Complete the equation:

$$CuSO_4 + A \rightarrow Cu_3P_2 + B$$

14 Draw the shape of XeO3. What is the hybridization of Xe in XeO3? Can PCl5 act as both oxidizing and reducing agent? Give reason to support your answer.

15 Explain chemistry of brown ring test.

16 If a solution of $CuSO_4$ is electrolyzed for 10 min with a current of 1.5 A. What is the mass of copper deposited at the cathode? At Mass of Cu = 63 g/mol

OR

Manu and his father went to a shop to purchase a battery for their invertor. Shopkeeper showed them two types of batteries, one with lead plates and the other with cadmium plates. The battery with cadmium plates was more expensive than the lead battery. Manu's father wanted to purchase lead battery as it was cheaper.
After reading the above passage, answer the following questions:

(i) As a student of chemistry, which battery would you suggest to Manu's father to buy?
(ii) What are the values associated with your decision?

17 Predict the products obtained on cathode and anode on electrolyzing the following solutions:
(i) Aqueous sodium chloride solution
(ii) concentrated sulphuric acid

18 A coordination compound has a formula ($CoCl_3 . 4NH_3$). It does not liberate NH3 but precipitates chloride ion as AgCl.Give the IUPAC name of the complex and write its structural formula.

19 How the following conversions can be carried out?

(i) Aniline to chlorobenzene
(ii) 2-Chlorobutane to 3, 4-dimethylhexane
(iii) 2-Methyl-1-propene to 2-chloro-2-methylpropane

20 Explain why?
(i) Vinyl chloride is unreactive in nucleophilic substitution reaction.
(ii) neo-pentyl bromide undergoes nucleophilic substitution reaction very slowly
(iii)tert-butyl chloride reacts with aqueous sodium hydroxide by S_N1 mechanism while n-butyl chloride reacts by S_N2 mechanism.

21 Compound (A), $C_4H_{10}O$, is found to be soluble in sulphuric acid. (A) does not react with sodium or potassium permanganate. When (A) is heated with excess of HI, it is converted into a single alkyl halide. What is (A)? Write the chemical reaction involved. What type of reactions are given byA?

22 Write the following name reactions:
(i) Clemmensen reduction
(ii) Wolff kishner reduction
(iii) Hell-Volhard Zelinskey rection

23 Give reasons for the following:
(i) During preparation of primary amines by ammonolysis of alky halides, a number of products are obtained.
(ii) Aromatic primary amines cannot be prepared by Gabriel Phthalimide synthesis.
(iii)Methylamine in water reacts with ferric chloride to precipitate hydrated ferric oxide.

24 Calculate the depression in the freezing point of water when 10 g of $CH_3CH_2CHClCOOH$ is added to 250 g of water. Ka = 1.4 x 10^{-3} K_f = 1.86 K kg mol^{-1}.

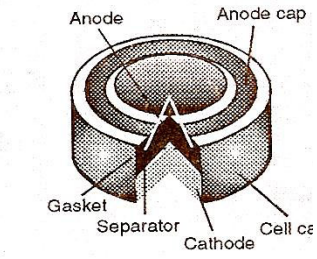
25 The Zinc / silver oxide cell is used in hearing aids and electric watches.

$Zn \longrightarrow Zn^{+2} + 2e^-$, E= 0.76 V

$Ag_2O + H_2O + 2e^- \rightarrow 2Ag + 2OH^-$ E^o = 0.344.

a) Which is oxidized and which is reduced ?

Find E of the cell and Δ G in joules.

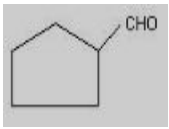


26 The given figure is of mercury cell:
(i)Which substances act as cathode and anode?
(ii) Which electrolyte is used in this cell?
(iii)What is the potential of the cell?
(iv)Why its cell voltage remain constant throughout its life?
(v)Write cell reactions.

27 Give the electronic configuration of the

(i) d-orbitals of Ti in $[Ti(H_2O)_6]^{3+}$ ion in an octahedral crystal field.
(ii) Why is this complex coloured? Explain on the basis of distribution of electrons in the d-orbitals.
(iii)How does the colour change on heating $[Ti(H_2O)_6]^{3+}$?

28 (a) Give one test each to distinguish between:
(i) Aqueous solution of acetaldehyde and acetone.
(ii) Aqueous solution of formaldehyde and acetaldehyde.
(b) Give IUPAC name of the following:



(c) Give reasons:
(i) Ethanal is more reactive towards nucleophilic addition reactions than propanone.
(ii) HCHO reacts with HCN faster than CH_3CHO.

OR

An organic compound (A) with molecular formula $C_9H_{10}O$ forms an orange- red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine and sodium hydroxide. It does not reduce 'Tollen's' reagent or Fehling solution, nor it decolourises bromine water or Bayer's reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid (B) having molecular formula $C_7H_6O_2$. Identify the compounds (A) and (B) and explain the reactions involved.

29 a) What are primary and secondary cells? Discuss construction and working of lead storage battery. (4)
(b) What is abnormal molecular mass? (1)

OR

(a) Tarnished siver contains Ag_2S. Can this tarnish be removed by immersing the tarnished silverware in an Al pan containing an inert electrolyte soln. such as NaCl?

Given that standard electrode potentials for half reactions are:
$Ag_2S(s) + 2e^- \rightarrow 2Ag(s) + S^{2-}(aq.)$ is -0.71 V
$Al^{3+}(aq.) + 3e^- \rightarrow Al(s)$ is -1.66 V. (2)
(b) Define van't Hoff factor.

30 Give the chemical reactions in support of the following observations:
(i) The +5 oxidation state of Bi is less stable than its +3 state.
(ii) Sulphur exhibits greater tendency for catenation than selenium.
(iii) Sodium iodate is, $NaIO_3$ is reduced with sodium hydrogen sulphite.
(iv) XeF_4 is subjected to hydrolysis.
(v) SO_2 reacts with hydrogen sulphide

OR

(a) What prompted Bartlet to the discovery of noble gas compounds?
(b) State important uses of OF_2 and XeF_6.
(c)Write structures of the following molecules:
(i) BrF_3 (ii) XeO_3

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