CBSE 12th Chemistry 2014 Unsolved Paper
Outside Delhi

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TIME - 3HR. | QUESTIONS - 30

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION – A

Q.1. What is the effect of temperature on chemisorption? *1 mark*

Q.2. What is the role of zinc metal in the extraction of silver? *1 mark*

Q.3. What is the basicity of H_3PO_3? *1 mark*

Q.4. Identify the chiral molecule in the following pair: *1 mark*

Q.5. Which of the following is a natural polymer? *1 mark*

Buna-S, Proteins, PVC

Q.6. The conversion of primary aromatic amines into Diazonium salts is known as_____? *1 mark*

Q.7. What are the products of hydrolysis of sucrose? *1 mark*

Q.8. Write the structure of p-methyl benzaldehyde. *1 mark*

SECTION - B

Q.9. An element with density $2.8\ g\ cm^{-3}$ forms a $f.c.c.$ unit cell with edge length $4\times10^{-8}cm$. Calculate the molar mass of the element. (Given: $N_A = 6.022\times 10^{23}mol^{-1}$) *2 marks*

Q.10. (i) What type of non-stoichiometric point defect is responsible for the pink color of LiCl?
(ii) What type of stoichiometric point defect is shown by NaCl? *2 marks*

Or

How will you distinguish between the following pairs of terms?
(i) Tetrahedral and octahedral voids
(ii) Crystal lattice and unit cell

Q.11. State Kohlrausch law of independent migration of ions. Why does the conductivity of a solution decrease with dilution? *2 marks*

Q.12. For a chemical reaction R⟶P, the variation in the concentration (R) vs. Time(t) plot is given as *2 marks*

(i) Predict the order of the reaction.
(ii) What is he slope of the curve?

Q.13. Explain the principle of the method of electrolytic refining of metals. Give one example. *2 marks*

Q.14. Complete the following equation: *2 marks*

(i) $P_4 + H_2O + NaOH \longrightarrow$

(ii) $XeF_4 + O_2F_2 \longrightarrow$

Q.15. Draw the structure of the following: *2 marks*

(i) XeF_2

(ii) BrF_3

Q.16. Write the equation involved in the following reactions: *2 marks*

(i) Reimer-Tiemann reaction

(ii) Williamson synthesis

Q.17. Write the mechanism of the following reaction: *2 marks*

$$CH_3CH_2OH \xrightarrow{HBr} CH_3CH_2Br + H_2O$$

Q.18. Write the name of the monomers used for getting the following polymers: *2 marks*

(i) Bakelite

(ii) Neoprene

SECTION - C

Q.19. (a) Calculate $\Delta_r G^\circ$ for the reaction Mg(s) + $Cu^{2+}(aq) \longrightarrow Mg^{2+}(aq) + Cu(s)$

Given: $E^\circ_{cell} = +2.71V, 1\ F = 96500\ C\ mol^{-1}$

(b) Name the type of cell which was used in Apollo space program for providing electrical power. *3 marks*

Q.20. The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume: *3 marks*

$$SO_2Cl_2(g) \longrightarrow SO_2(g) + Cl_2(g)$$

$Experiment$	$Times/s^{-1}$	$Total\ pressure/atm$
1	0	0.4
2	100	0.7

Calculate the rate constant. (Given: Log 4 = 0.6021, Log 2 =0.3010)

Q.21. What are emulsions? What are there different types? Give one example of each type. *3 marks*

Q.22. Give reasons for the following: *3 marks*

(i) $(CH_3)_3\,P=O$ ***exists but*** $(CH_3)_3\,N=O$ ***does not.***

(ii) Oxygen has less electron gain enthalpy with negative sign than Sulphur.

(iii) H_3PO_2 ***is a stronger reducing agent than*** H_3PO_3.

Q.23. (i) Write the IUPAC name of the complex $[Cr(NH_3)_4Cl_2]Cl$.

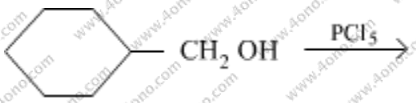
(ii) What type of isomerism is exhibited by the complex $[Co(en)_3]^{3+}$**?**

(iii) Why is $[Nicl_4]^{2-}$**paramagnetic** $[Ni(CO)_4]$ **is a diamagnetic?** *3 marks*

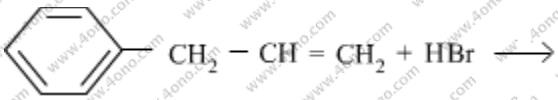
$(At.Nos.: Cr = 24, Co = 27, Ni = 28)$

Q.24. (a) Draw the structures of major monohalo products in each of following reactions: *3 marks*

(i)



(ii)



(b) Which halogen compound in each of the following pairs will react faster in S_N2 **reaction:**

$(i)\ CH_3Br$ ***or*** CH_3I. $(ii)(CH_3)_3C-Cl$ ***or*** CH_3-Cl.

Q.25. Account for the following:

(i) Primary amines $(R-NH_2)$ **have higher boiling point than tertiary amines** (R_3N).

(ii) Aniline does not undergo Friedel – Crafts reaction.

(iii) $(CH_3)_2NH$ **is more basic than** $(CH_3)_3N$ **in an aqueous solution.** *3 marks*

Or

Give the structure of A, B and C in the Following reactions:

(i) $C_6H_5NO_2 \xrightarrow{Sn+HCl}$

$$\boldsymbol{A} \xrightarrow[273k]{NaNO_2 + HCl} \boldsymbol{B} \xrightarrow{H_2O} \boldsymbol{C}$$

(ii) $CH_3CN \xrightarrow{H_20/H^+} \boldsymbol{A} \xrightarrow[\Delta]{\boldsymbol{NH_3}}$

$$\boldsymbol{B} \xrightarrow{\boldsymbol{Br_2+KOH}} \boldsymbol{C}.$$

Q.26. Define the following terms as related to proteins: *3 marks*

(i) Peptide Linkage

(ii) Primary structure

(iii) Denaturation

Q. 27. On the occasion of World Health Day, Dr. Satpal organized a 'health camp' for the poor farmers living in a nearby village. After check-up, he was shocked to see that most of the farmers suffered from cancer due to regular exposure to pesticides and many were diabetic. They distributed free medicines to them. Dr. Satpal immediately reported the matter to the National Human Rights Commission (NHRC). On the suggestions of NHRC, the government decided to provide medical care, financial assistance, setting up of super- specialty hospitals for treatment and prevention of the deadly disease in the affected villages all over India.

(i) Write the values shown by

(a) Dr. Satpal

(b) NHRC.

(ii) What type of analgesics are chiefly used for the relief of pains of terminal cancer?

(iii) Give an example of artificial sweetener that could have been recommended to diabetic patients. *3 marks*

SECTION – D

Q.28. (a) Define the following terms: *5 marks*

(i) Molarity,

(ii) Molal elevation constant (K_b)

(b) A solution containing 15 g urea (molar mass = 60 g mol^{-1}) per lit-re of solution in water has the same osmotic pressure (isotonic) as a solution of glucose (molar mass = 180 g mol^{-1}) in water. Calculate the mass of glucose present in one litre of its solution.

Or

(a) What type of deviation is shown by a mixture of ethanol and acetone? Give reason.

(b) A solution of glucose (molar mass = 180 g mol^{-1}) in water is labelled as 10% (by mass). What would be the molality and molarity of the solution? (Density of solution =1.2mL^{-1})

Q.29. (a) Complete the following equation: *5 marks*

$(i)\ Cr_2O_4^{2-} + 2OH^- \longrightarrow$

$(ii)\ MnO_4^- + 4H^+ + 3e^- \longrightarrow$

(b) Account for the following:

(i) Zn is not considered as a transition element.

(ii) Transition metals from a large number of complexes.

(iii) The E° value for the Mn^{3+}/Mn^{2+} couple is much more positive than that for Cr^{3+}/Cr^{2+} Couple.

Or

(i) With reference to structural variability and chemical reactivity, write the differences between lanthanoides and actinoids.
(ii) Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.
(iii) Complete the following equation: $MnO_4^- + 8H^+ + 5e^- \longrightarrow$
(iv) Out of Mn^{3+} and Cr^{3+}, which is more paramagnetic and why? Atomic nos.: Mn =25, Cr =24)

Q.30. (a) Write the products formed when CH_3CHO reacts with the following reactions: *5 marks*
(i) HCN
(ii) H_2N-OH
(iii) CH_3CHO the presence of dilute NaOH

(b) Give simple chemical tests to distinguish between the following pairs of compounds:
(i) Benzoic acid and Phenol
(ii) Propanal and Propanone

OR

(a) Account for the following:
(i) $Cl-CH_2COOH$ is a stronger acid than CH_3COOH.
(ii) Carboxylic acids do not give reactions of carbonyl group.

(b) Write the chemical equations to illustrate the following name reactions:
(i) Resenmund reduction
(it) Cannizzaro's reaction

(c) Out of $CH_3CH_2-CO-CH_2-CH_3$ and $CH_3CH_2-CH_2-CO-CH_3$ which gives iodoform test?

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