CBSE 12th Chemistry 2015 Unsolved Paper Outside Delhi

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TIME - 3HR. | QUESTIONS - 26

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION – A

Q.1. Write the formula of any two oxoacids of Sulphur. *1 mark*

Q.2. write the IUPAC name of the following compound: *1 mark*

$$CH_3 - \underset{\displaystyle CH_2}{\underset{|}{CH}} - CH_2 - O - CH_2 - CH_3$$

Q.3. A delta is formed at the meeting point of sea water and river water. Why? *1 mark*

Q.4. Which would undergo S_N1 reaction faster in the following pair: *1 mark*

$$CH_3 - CH_2 - CH_2 - Br \text{ and } CH_3 - \underset{\displaystyle Br}{\underset{|}{CH}} - CH_3$$

Q.5. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 2/3rd of tetrahedral voids? *1 mark*

SECTION - B

Q.6. Write one similarity and 1 difference between the chemistry of lanthanoids and that of actinoids. *2 marks*

Q.7. (i) Write down the IUPAC name of the following complex: *2 marks*

$$[Co(NH_3)_5Cl]^{2+}$$

(ii) Write the formula for the following complex: Potassium tetrachloridonickelate(II).

Q.8. Write the reagents required in the following reactions: *2 marks*

(i) $CH_2 = CH - CH_2OH \xrightarrow{?} CH_2 = CH - CHO$

(ii) $CH_3 - COOH \xrightarrow{?} CH_3 - CONH_2$

Or

Arrange the following compounds in increasing order of their property as indicated:

(*i*) $CH_3COCH_3, C_6H_5COCH_3, CH_3CHO$
(reactivity towards nucleophilic addition reaction)

(ii) $Cl - CH_2 - COOH, F - CH_2 - COOH, CH_3 - COOH$ ($acidic\ character$)

Q.9. (i) On mixing liquid X and liquid Y, volume of the resulting solution decreases. What type of deviation from Raoult's law is shown by the resulting solution? What change in temperature would be observe after mixing liquids X and Y? *2 marks*

(ii) What happens when we place the blood cell in water (hypotonic solution)? Give reason.

Q.10. Calculate the time to deposit 1.27g of copper at cathode when a current of 2A was passed through the solution of $CuSO_4$

($Molar\ mass\ of\ Cu = 63.5 g\ mol^{-1}, 1F = 96500\ C\ mol^{-1}$). *2 marks*

SECTION – C

Q.11. A solution is prepared by dissolving 10g of non-volatile solute in 200g of water. It has a vapour pressure of 31.84 mm Hg at 308K. Calculate the molar mass of the solute. (Vapour pressure of pure water at 308K = 32MM Hg) *3 marks*

Q. 12. (i) Name the method of refining to obtain silicon of high purity.

(ii)What is the role of SiO_2 in the extraction of copper?

(iii) What is the role of depressants in froth floatation process? *3 marks*

Q. 13. (i) Which one of the following is a Polysaccharide: starch, maltose, fructose, glucose

(ii) Write one difference between α-helix and β-pleated sheet structures of protein.

(iii) Write the name of the disease caused by the deficiency of vitamin B_{12}. *3 marks*

Q.14. What type of isomerism is shown by the complex$[Cr(H_2O)_6]Cl_3$?

(ii) On the basis of crystal field theory, write the electronic configuration for d^4 ion if $\Delta_o P$.

(iii) Write the hybridization and shape of $[CoF_6]^{3-}$. (Atomic no. of Co = 27) *3 marks*

Q.15. How can the following conversions be carried out: *3 marks*

(i) Aniline to bromobenzene

(ii) Chlorobenzene to 2-chloroactophenone

(iii) Chloroethane to butane

Or

What happen when?

(i) Chlorobenzene is treated with Cl_2 $FeCl_3$.
(ii) Ethyl chloride is treated with $AgNO_2$.
(iii) 2-bromopentane is treated with alcoholic KOH?

Write the chemical equation in support of your answer.

Q.16. Examine the given defective crystal: *3 marks*

X^+	Y^-	X^+	Y^-	X^+
Y^-	O	Y^-	X^+	Y^-
X^+	Y^-	X^+	O	X^+
Y^-	X^+	Y^-	X^+	Y^-

Answer the following questions:

(i) Is the above defect stoichiometric or non- stoichiometric?

(ii) Write the term used for this type of defect. Give an example of the compound which shows this type defect.

(iii) How does this defect affect the density of the crystal?

Q.17. Conductivity of $2.5\times10^{-4}M$ Methanoic acid is $5.25\times10^{-5}S\ cm^{-1}$ Calculate its molar conductivity and degree of dissociation. Given:
$\lambda^{\circ}(H^+)349.5cm^2mol^{-1}$ $And\ \lambda^{\circ}(HCOO^-) = 50.5cm^2mol^{-1}$ *3 marks*

Q.18. Write any three difference between physisorption and chemisorption. *3 marks*

Ans.

Physisorption	Chemisorption
1. Force between adsorbate and adsorbent is weakvander wall's forces. 2. Occurs at low temp and decreases with temp increase. 3. Low heat of adsorption (20-40kj/mol)	Force between adsorbate and adsorbent is strong chemical bond. It increase with temp increase High heat of adsorption (80-240Kj/mol)

Q.19. Give reason for the following: *3 marks*

(i) Phenol is more acidic than methanol.

(ii) The C-O-H bond angle in alcohols is slightly less than the tetrahedral angle ($109^o28'$).

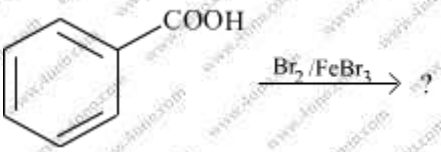
(iii) $(CH_3)_3C-O-CH_3$ **on reaction with HI gives** $(CH_3)_3C-I$ and CH_3-OH **as the main products and not** $(CH_3)_3C-OH$ **and** CH_3-I.

Q.20. Predict the products of the following reactions: *3 marks*

(i) $CH_3-\underset{\underset{CH_3}{|}}{C}=O \xrightarrow{H_2N-NH_2}$?

(ii) $C_6H_5-CH_3 \xrightarrow[(b)H^+]{(a)KMnO_4/KOH}$?

(iii)



Q.21. (a) Account for the following: *3 marks*

(i) Cu^+ **is unstable is an aqueous solution.**

(ii) Transition metals form complex compounds.

(b) Complete the following equation:

$$Cr_2O_7^{2-} + 8H^+ + 3No_2^- \longrightarrow$$

Q.22. Write the names and structure of the monomers of the following polymers: *3 marks*

(i) Terylene, (ii) Buna-S, (iii) Neoprene

SECTION – D

Q.23. Seeing the growing cases of diabetes and depressi0n among young children, Mr.Chopra, the principal of one reputed school organized a seminar in which he invited parents and principals. They all resolved this issue by strictly banning junk food in schools and introducing healthy snacks and drinks like soup, lassi, milk, etc. in school canteens. They also decided to make compulsory half an hour of daily physical activities for the students in the morning assembly. After six months, Mr. Chopra conducted the health survey in most of the schools and discovered a tremendous improvement in the health of the students.

After reading the above passage, answer the following questions: *4 marks*

(i) What are the values (at least two) displayed by Mr. Chopra?

(ii) As a student, how can you spread awareness about this issue?

(iii) Why should antidepressant drugs not 'be taken without consulting a doctor?

(iv) Give two examples of artificial sweeteners.

SECTION – E

Q. 24. (a) Account for the following: *5 marks*

(i) Acidic character increases from HF to HI.

(ii) There is large difference between the melting and boiling points of oxygen and Sulphur.

(iii) Nitrogen does not form pentahalide.

(b) Draw the structure of the following:

(i) ClF_3, $(ii)XeF_4$

(i) Which allotrope of phosphorus is more reactive and why?

(ii) How the supersonic jet airplane is responsible for the depletion of ozone layers?

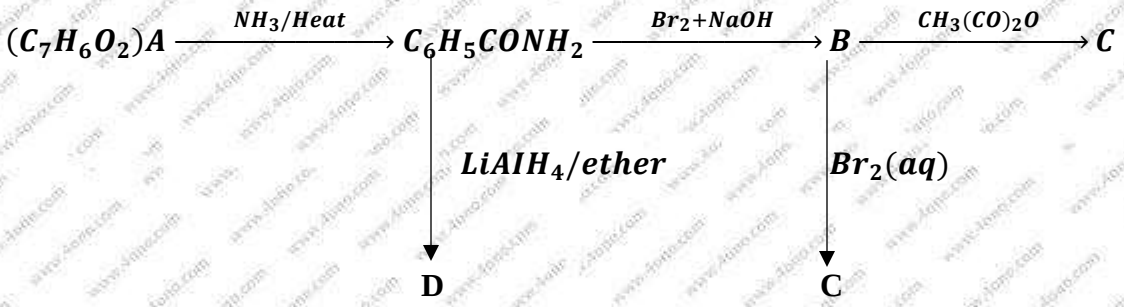
(iii) F_2 has lower bond dissociation anthalpy than Cl_2 why?

(iv) Which noble gas Is used in filling balloons for meteorological observations?

(v) Complete the equation:

$$XeF_2 + PF_5 \longrightarrow$$

Q.25. An aromatic compound 'A' of molecular formula $C_7H_6O_2$ undergoes a series of reaction: *5 marks*



As shown below. Write the structures of A, B, C, D and E in the following reactions:

Or

(a) Write the structures of main products when benzene diazonium chloride reacts with the following reagents:

(i) $H_3PO_2 + H_2O$

(ii) CuCN/KCN

(iii) H_2O

(b) Arrange the following in the increasing order of their basic character in an aqueous solution:

$$C_2H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N$$

(c) Give a simple chemical test to distinguish between the following pair of compounds:

$C_6H_5 - NH_2$ *and* $C_6H_5 - NH - CH_3$

Q.26. For the hydrolysis of methyl acetate in aqueous solution, the following result are obtained: *5 marks*

t/s	0	10	20
$CH_3COOCH_3 l/\ mol\ L^{-1}$	0.10	0.05	0.025

(a) Show that it follows pseudo first order reaction, as the concentration of water remains constant.

(b) Calculate the average rate of reaction between the time interval 10 to 20 seconds.

$$(\text{Given} : \text{Log}\ 2 = 0.3010, \quad \text{Log}\ 4 = 0.6021)$$

Or

(a) For a reaction A + B ⟶ P, the rate is given by rate = k[A][B]^2

(i) How is the rate of reaction affected in the concentration of B is doubled?

(ii) What is the overall order of reaction if A is present in large excess?

(b) A first order reaction takes 30 minutes for 50% completion. Calculate the time required for 90% completion of the reaction.