CBSE 12th Chemistry 2017 Unsolved Guess Paper

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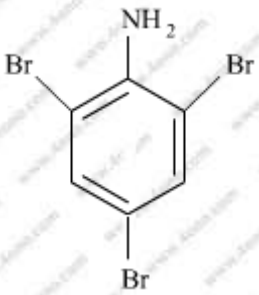
TIME - 3HR. | QUESTIONS - 26

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION – A

Q.1. What is the basicity of H_3PO_4? *1 mark*

Q.2. Write the IUPAC name of the given compound: *1 mark*



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

Q. 4. Is $(-CH_2-CH-)_n$ a homopolymer or a copolymer. *1 mark*

Q.5. What is Tollens's reagent? Write one usefulness of this reagent. *1 mark*

SECTION – B

Q.6. Describe the following: *2 marks*

(i) Tyndall effect

(ii) Shape-selective catalysis

Q.7. What are biodegradable and non-biodegradable detergents? Give one example of each class. *2 marks*

Q.8. Draw the structure of the following: *2 marks*

(i) XeF_2

(ii) BrF_3

Q.9. Complete the following chemical reaction equations: *2 marks*

(i) $Cr_2O_7^{2-} + I^- + H^+ \longrightarrow$

(ii) $MnO^-_4 + NO^-_2H^+ \longrightarrow$

Q.10. Differentiate between molecular structures and behaviors of the rmoplastic and thermosetting polymers. Give one example of each type. *2 marks*

SECTION – C

Q.11. How would you convert the following: *3 marks*

(i) Phenol to benzoquinone

(ii) Propanone to 2-methylpropan-2 ol

(iii) Propene to propan-2-ol

Q.12. (a) How do you convert the following: *3 marks*

(i). Phenol to anisole

(ii). Propan-2-ol to 2-methylpropan-2-ol

(iii). Aniline to pheno

OR

(a) Write the mechanism of the following reaction:

$2CH_3CH_2OH \xrightarrow{H^+} CH_3CH_2 - O - CH_2CH_3$

(b)Write the equation involved in the acetylation of Salicylic acid.

Q.13. (a) Write the mechanism of the following reaction.

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

(b) Write the equation involved in Reimer-Tiemann reaction. *3 Marks*

Q.14. Write the IUPAC names of the following coordination compounds: *3 marks*

(i) $[Cr(NH_3)_3Cl_3]$

(ii) $K_3[Fe(CN)_6]$

(iii) $[CoBr_2(em)_2]^+, (en = ethylenediamine)$

Q.15. Write chemical equations for the following conversion: *3 marks*

(i) Nitrobenzene to benzoic acid.

(ii) Benzyl chloride to 20phenylethanamine.

(iii) Aniline to benzyl alcohol.

Q.16. Describe the following giving one example for each: *3 marks*

(i) Detergents
(ii) Food preservatives
(iii) Antacids

Q. 17. A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in 99.0 of benzene has a boiling point of 80.31 °C. Determine the molar mass of this compound. (B.P. of pure benzene = 80.10 °C and K_b for benzene = 2.53 °C kg mol^{-1}) *3 marks*

Q. 18. (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.19. 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) $C_6H_5NO_2 \xrightarrow{Sn+HCl}$

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

(ii) $CH_3CN \xrightarrow{H_2O/H^+} A \xrightarrow[\Delta]{NH_3}$

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

Q.20. What mass of NaCl (molar mass $= 58.5$ g mol^{-1}) be dissolved in 65 g of water to lower the freezing point by $7.5°C$? The freezing point depression constant, K_f, for water is 1.86 K kg mol^{-1}. Assume van't Hoff factor for NaCl is 1.87. *3 marks*

Q. 21. Account for the following observations: *3 marks*

(i) pK_b **for aniline is more than that for methylamine.**

(ii) Methylamine solution in water reacts with ferric chloride solution to give a precipitate of ferric hydroxide.

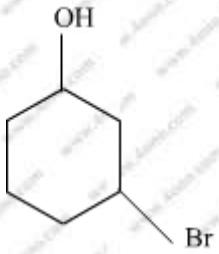
(iii) Aniline does not undergo Friedel-Crafts reaction.

Q.22. Name the following compounds according to IUPAC system. *3 marks*

(i)

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

(ii)



(iii)

$$CH - \underset{\displaystyle CH_3}{\underset{|}{C}} = \underset{\displaystyle Br}{\underset{|}{C}} - CH_2 - OH$$

SECTION – D

Q.23. (a)What is meant by undictated, bidentate and ambidentate ligands? Give two examples for each.

(b)Calculate the overall complex dissociation equilibrium constant for the $Cu(NH_3)_4^{2+}$ **ion, given that** β_4 **for this complex is** 2.1×10^{13}**.** *4 marks*

SECTION – E

Q. 24. (a) write a suitable chemical equation to complete each of the following transformations: *5 marks*

(i) Butan-1-o1 to butanoic acid

(ii) 4-Methylacetophenone to benzene-1, 4-dicarboxylic acid

(b) An organic compound with molecular formula $C_9H_{10}O$ **forms 2,4-DNP derivative, reduces Tonen's reagent and undergoes Cannizzaro's reaction. On vigorous oxidation it gives 1,2-benzenedicarboxylic acid, Identify the compound.**

OR

(a) Give chemical tests to distinguish between
(i) Propanol and propanone
(ii) Benzaldehyde and acetophenone
(b) Arrange the following compounds in an increasing order of their property as indicated:
(i) Acetaldehyde, Acetone, Methyl tert-butyl ketone (reactivity towards HCN)
(ii) Benzoic acid, 3,4-Dinitrobenzoic acid, 4-Methoxybenzoic acid (acid strength)
(iii) $CH_3CH_2CH(Br)COOH, CH_3CH(Br)CH_2COOH, (CH_3)_2CH$ **COOH (acid strength)**

Q. 25. Assign reasons for the following: *5 Marks*

(i) Sulphur vapour is paramagnetic.

(ii) Ammonia (NH3) has greater affinity for protons than phosphine (PH_3**).**

(iii) The negative value of electron gain enthalpy of fluorine is less than that of chlorine.

(iv) SF_6 **is much less reactive than** SF_4**.**

(v) Of the noble gases only xenon is known to form well-established chemical compounds.

OR

(a) Describe the favorable conditions for the manufacture of (i) ammonia by Haber's process, and (ii) sulphuric acid by contact process.

(b) Draw the structures of the following:

(i) PCl_5**(g)**

(ii) S_8**(g)**

(iii) CIF_3 **(g)**

Q.26. (a) Differentiate between molarity and molality for a solution. How does a change in temperature influence their values? *5 marks*

(b) Calculate the freezing point of an aqueous solution containing 10.50 g 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)**

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