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CBSE 12th Chemistry 2012 Unsolved Paper Delhi Board

TIME - 3HR. | QUESTIONS - 30

THE MARKS ARE MENTIONED ON EACH QUESTION

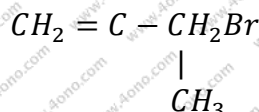
SECTION – A

Q.1. What is meant by 'doping' in a semiconductor? *1 mark*

Q.2. What is the role of graphitic in the electrometallurgy of aluminum? *1 mark*

Q.3. Which one of PCl_4^+ is not likely and why? *1 mark*

Q.4. Give the IUPAC name of the following compound. *1 mark*



Q.5. Draw the structural formula of-2 ol molecule. *1 mark*

Q.6. Arrange the following compound in an increasing order of their reactivity in nucleophilic addition reactions: Ethanol, Propanal, butanone, propanone. *1 mark*

Q.7. Arrange the following in the decreasing order of their strength in aqueous solutions: CH_3NH_2 , $(CH_3)_2NH$, $(CH_3)_3N$ and NH_3 *1 mark*

Q.8. Define the term, 'homopoly-merisation' Giving example. *1 mark*

SECTION – B

Q.9. A 1.00 molal aqueous solution of trichloroacetic acid (CCl_3COOH) is its boiling point. The solution has the boiling point of $100.18^\circ C$. Determine the Van't Hoff factor for trichloro-acetic acid. (K_b for water = $0.512 K Kg mol^{-1}$) *2 marks*

Or

Define the following terms:

(i) Mole fraction

(ii) Isotonic solutions

(iii) Van't Hoff factor

(iv) Ideal solution

Q.10. What do you understand by the order of a reaction? Identify the reaction order from each of the following units of reaction rate constant: 2 marks

- (i) $L^{-1} mol S^{-1}$
- (ii) $L mol^{-1} S^{-1}$

Q.11. Name the two groups into which phenomenon of catalysis can be divided. Give an example of each group with the chemical equation involved. 2 marks

Q.12. What is meant by coagulation of colloidal solution? Describe briefly and three methods by which coagulation of lyophobic sols can be carried out. 2 marks

Q.13. Describe the principle involved in each of the following processes. 2 marks

- (i) Mond process for refining of Nickel.
- (ii) Column chromatography for purification of rare elements.

Q.14. Explain the following giving higher oxidation reason in each case. 2 marks

- (i) O_2 and F_2 both stabilize higher oxidation states of metals but O_2 exceeds F_2 in doing so.
- (ii) structure of Xenon fluorides cannot be explained by Valence Bond Approach.

Q.15. Complete the following chemical equations: 2 marks

- (i) $Cr_2O_7^{2-} + H^+ + I^- \rightarrow$
- (ii) $MnO_4^- + NO_2^- + H^+ \rightarrow$

Q.16. What is meant by 2 marks

- (i) Peptide linkage
- (ii) biocatalyst?

Q.17. Write any two reactions of glucose which cannot be explained by the open chain structure of glucose molecule. 2 marks

Q.18. Draw the structure of the monomer for each of the following polymers: 2 marks

- (i) Nylon 6
- (ii) Polypropene

Q.19. Tungsten crystallizes in body centered cubic unit cell. If the edge of the unit cell is 316.5 pm, what is the radius of tungsten atom? 3 marks

SECTION - C

Or

Iron has a body centered cubic unit cell with a cell dimension of 286.65 pm. The density of iron is $7.874 g cm^{-3}$. Use this information to calculate Avogadro's number. (At. Mass of Fe=55.845 u)

Q.20. Calculate the amount of KCl which must be added to 1 kg of water so that the freezing point is depressed by 2K. (K_f for water = $1.86 K Kg mol^{-1}$) 3 marks

Q.21. For the reaction $2NO(g) + Cl_2(g) \rightarrow 2NOCl(g)$ the following data were collected. All the measurements were taken at 263K: *3 marks*

Experiment No.	Initial [NO] (M)	Initial [Cl_2] (M)	Initial rate of disappearance of Cl_2 (M/min)
1	0.15	0.15	0.60
2	0.15	0.13	1.20
3	0.30	0.15	2.40
4	0.25	0.25	?

- Write the expression for rate law.
- Calculate the value of rate constant and specify its units.
- What is the initial rate of Disappearance of Cl_2 in exp. 4?

Q.22. How would you account for the following? *3 marks*

- Many of the transition elements are known to form interstitial compounds.
- the metallic radii of the third (5d) series of transition metal are virtually the same as those of the corresponding group members of the second (4d) series.
- Lanthanoids form primarily +3 ions, while the actinoids usually have higher oxidation states in their compounds, +4 or even +6 being typical.

Q.23. Give the formula of each of the following coordination entities: *3 marks*

- CO^3 ion is bound to one Cl^- , one NH_3 molecules and two bidentate ethylene diamine (en) molecules.
- Ni^{2+} ion is bound to two water molecules and two oxalate ions.

Write the name and magnetic behavior of each of the above coordination entities.
(At. Nos. Co=27, Ni =28)

Q.24. Although chlorine is an electron withdrawing group, yet it is ortho-, para-directing in electrophilic aromatic substitution reactions. Explain why it is so? *3 marks*

Q.25. Draw the structure and name the product formed if the following alcohols are oxidized. Assume that an excess of oxidizing agent is used. *3 marks*

- $CH_3CH_2CH_2CH_2OH$
- 2-butenol
- 2-methyl-1-propanol

Q.26. Write chemical equations for the following conversion: *3 marks*

- Nitrobenzene to benzoic acid.
- Benzyl chloride to 2-phenylethanamine.
- Aniline to benzyl alcohol.

Q.27. What are the following substances? Give an example of each one of them. *3 marks*

- Tranquilizers
- Food preservatives
- Synthetic detergents

SECTION - D

Q.28. (a) What type of a battery is the lead storage battery? Write the anode and the cathode reactions and the overall reaction occurring in lead storage battery when current is drawn from it. 5 marks

(b) In the button cell, widely used in watches, the following reaction takes place



Determine E^0 and ΔG^0 for the reaction.

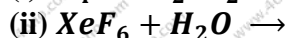
(given: $E^0_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$, $E^0_{\text{Zn}^{2+}/\text{Zn}} = -0.76\text{V}$)

Or

(a) Define molar conductivity of a solution and explain how molar conductivity changes with change in concentration of solution for a weak and a strong electrolyte.

(b) The resistance of conductivity cell containing 0.001 M KCl solution at 298 K is 1500 Ω . What is the cell constant if the conductivity of 0.001 M KCl solution at 298 K is $0.146 \times 10^{-3} \text{ S Cm}^{-1}$?

Q.29. (a) Complete the following chemical reaction equations: 5 marks



(b) Predict the shape and the asked angle (90° or more or less) in each of the following cases:

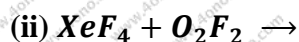
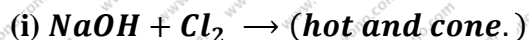
(i) SO_3^{2-} and the angle O-S-O

(ii) ClF_3 and the angle F-Cl-F

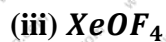
(iii) XeF_2 and the angle F-Xe-F

Or

(a) Complete the following chemical equations:



(b) Draw the structures of the following molecules:



Q.30. Illustrate the following name reactions giving suitable example in each case: 5 marks

(i) Clemmensen reduction

(ii) Hell-Volhard-Zelinsky reaction

(b) How are the following conversions carried out?

(i) Ethylcyanide to ethanoic acid.

(ii) Butanol to Butanoic acid

(iii) Benzoic acid to m-bromobenzoic acid

Or

(a) Illustrate the following reactions suitable example for each.

(i) Cross aldol condensation

(ii) Decarboxylation

(b) Give simple tests to distinguish between the following pairs of compounds

(i) Pentan-2-one and pentan-3-one

(ii) Benzaldehyde and acetophenone

(iii) Phenol and benzoic acid



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