

PART - I

- During the decomposition of H_2O_2 to give dioxygen, 48 g O_2 is formed per minute at certain point of time. The rate of formation of water at this point is :
 (a) $2.25 \text{ mol min}^{-1}$ (b) $0.75 \text{ mol min}^{-1}$
 (c) 3.0 mol min^{-1} (d) 1.5 mol min^{-1}
- How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide ?
 (a) 3 (b) 1
 (c) 4 (d) 2
- Non-stick cookwares generally have a coating of a polymer, whose monomer is :
 (a) chloroethene
 (b) ethane
 (c) 1,1,2,2-tetrafluoroethane
 (d) prop-2-enenitrile
- The compound that reacts with nitrous acid to give yellow oily liquid is ____ .
 (a) N -methylaniline
 (b) Nitro benzene
 (c) Aniline
 (d) N, N-dimethyl aniline
- Boric acid is an acid because its molecule :
 (a) combines with proton to form water molecule.
 (b) contains replaceable H^+ ion.
 (c) accepts OH^- from water, releasing proton.
 (d) gives up a proton.
- In an electrical field, the particles of a Colloidal system move towards cathode. The coagulation of the same sol is studied using (i) K_2SO_4 , (ii) Na_3PO_4 , (iii) $\text{K}_4[\text{Fe}(\text{CN})_6]$ and (iv) NaCl . Their coagulating power should be :
 (a) (iii) > (ii) > (i) > (iv)
 (b) (i) > (ii) > (iii) > (iv)
 (c) (ii) > (i) > (iv) > (iii)
 (d) None of these
- Assertion :** Bond dissociation energy of Fluorine is greater than Chlorine gas.
Reason : Chlorine has more electronic repulsion than Fluorine.
 (a) Assertion is true but Reason is false.
 (b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 (c) Both Assertion and Reason are false.
 (d) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- In calcium fluoride, having the fluorite structure, the coordination number of Ca^{2+} ion and F^- ion are :
 (a) 8 and 4 (b) 4 and 2
 (c) 4 and 8 (d) 6 and 6
- The secondary structure of a protein refers to ____ .
 (a) sequence of α -amino acids
 (b) fixed configuration of the polypeptide backbone
 (c) α -helical backbone
 (d) hydrophobic interaction
- At 25° , ionic product constant Λ_n , of water is 1.00×10^{-14} . Its value at 40°C is
 (a) 1.00×10^{-14} (b) 1.14×10^{-15}
 (c) 2.05×10^{-15} (d) 2.71×10^{-14}

11. What is the oxidation number of the central metal ion in the complex, $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2]\text{Br}$?

- (a) +4 (b) +2
(c) +6 (d) 13

12. The number of electrons that have a total charge of 9650 coulombs is :

- (a) 0.022×10^{22} (b) 0.22×10^{23}
(c) 0.022×10^{34} (d) 0.022×10^{24}

13. Which one of the following is the Strongest acid?

- (a) 4-nitrophenol (b) 2-nitrophenol
(c) 5-nitrophenol (d) 2-chlorophenol

14. $\text{CH}_3\text{Br} \xrightarrow{\text{KCN}} (\text{A}) \xrightarrow{\text{H}_3\text{O}^+} (\text{B}) \xrightarrow{\text{PCl}_5} (\text{C})$ Product (C) is :

- (a) chloroacetic acid
(b) α -chlorocycanoethanoic acid
(c) acetylchloride
(d) none of these

15. Extraction of gold and silver involves leaching with cyanide ion. Silver is later recovered by :

- (a) Displacement with Zinc
(b) Distillation
(c) Liquation
(d) Zone refining

PART – II

16. Which type of ores can be concentrated by froth floatation method ? Give an example for ores.

17. What happens when PCl_5 is heated ?

18. Why do Zirconium and Hafnium exhibit similar properties?

19. Define Solubility Product.

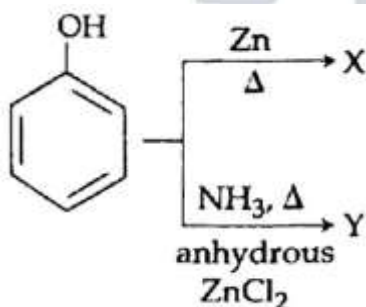
20. Define Equivalent Conductance.

21. Peptising agent is added to convert precipitate into colloidal solution. Explain this statement with an example.

22. Write Gattermann-Koch reaction.

23. How are drugs classified ?

24. Find the products X and Y in the following reactions.



PART – III

25. Describe a method for refining Nickel.

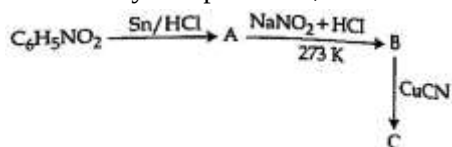
26. Write short notes on bleaching action of Sulphur dioxide.

27. What are hydrate isomers? Explain with an example.

28. Distinguish tetrahedral and octahedral voids.

29. What are the limitations of Freundlich adsorption isotherm ?

30. Identify compounds A, B and C in the following sequence of reaction.



31. What is Condensation Polyme ? Give two examples.
32. Mention any three functions of lipids in living organism.
33. The rate constant for a first order reaction is $1.54 \times 10^{-3} \text{ s}^{-1}$. Calculate its half life time.

PART - IV

34. (a) (i) Describe the role of the following in the process mentioned.

(1) Cryolite in the extraction of Aluminium.

(2) Iodine in the refining of Zirconium.

(ii) State any three properties of inter halogen compounds.

OR

(b) (i) How will you identify borate radical ?

(ii) Give the uses of Borax.

35. (a) Describe the preparation of potassium dichromate.

OR

(b) Write the postulates of Werner's theory.

36. (a) (i) Write a short note on metal excess defect with an example.

(ii) Explain Pseudo first order reaction with an example.

OR

(b) Calculate the pH of 0.1MCH₃COOH solution. Dissociation constant of acetic acid is 1.8×10^{-5} .

37. (a) Derive an expression for Nernst equation.

OR

(b) How will you convert

(i) Ethyl alcohol → Ethene

(ii) Ethylene glycol → 1,4-dioxane

38. (a) An organic compound (A) of molecular formula C₇H₆O undergoes Cannizaro reaction. Compound (A) also reacts with Chlorine in the presence of Conc₃FeCl₃ to give Compound (B). Compound (A) reacts with Chlorine in the absence of catalyst to give Compound (C). Identify A, B and C with suitable reactions.

OR

(b) (i) How will you distinguish between nitro and aci form of CH₃NO₂ ?

(ii) What are the types of RNA which are found in cell ?