GOVERNMENT PUBLIC QUESTION PAPER – MARCH 2025
HIGHER SECONDARY SECOND YEAR – CHEMISTRY

Time allowed: 3.00Hours **Maximum Marks 70**

PART - 1

Note: (i) Answer **all** the questions. **15x1=15**

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and corresponding answer.

1. **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 mol min^{-1} (b) 0.75 mol min^{-1}
   (c) 3.0 mol min^{-1} (d) 1.5 mol min^{-1}

2. **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

3. **Non-stick cook wares generally have a coating of a polymer, whose monomer is:**
   (a) chloroethene (b) ethane
   (c) 1,1,2,2-tetrafluoroethane (d) prop-2-enenitrile

4. **The compound that reacts with nitrous acid to give yellow oily liquid is**
   (a) N-methylaniline (b) Nitro benzene
   (c) N, N-dimethyl aniline (d) Aniline

5. **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.

6. **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) K4[Fe(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

7. **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.**

8. **In calcium fluoride, having the flurite structure, the coordination number of Ca2+ ion and F- ion are:**
(a) 8 and 4 (b) 4 and 2 (c) 4 and 8 (d) 6 and 6

9. **The secondary structure of a protein refers to**
(a) sequence of a-amino acids
(b) fixed configuration of the polypeptide backbone
(c) a-helical backbone
(d) hydrophobic interaction

10. **At 25℃ ionic product constant K_w of water is 1.00×10^{-14}. Its value at 40°C is**
(a) 1.00×10^{-14} (b) 1.14×10^{-15}
(c) 2.71×10^{-14} (d) 2.95×10^{-15}

11. **What is the oxidation number of the central metal ion in the complex, $[Pt(NO_2)(H_2O)(NH_3)_2]Br$**
(a) +4 (b) +2 (c) +6 (d) +3

12. **The number of electrons that have a total charge of 9650 coulombs is:**
(a) 6.022×10^{22} (b) 6.22×10^{23}
(c) 6.022×10^{34} (d) 6.022×10^{24}

13. **Which one of the following is the Strongest acid?**
(a) 4-nitrophenol (b) 2-nitrophenol
(c) 3-nitrophenol (d) 4-chlorophenol

14. $CH_3Br \xrightarrow{KCN} (A) \xrightarrow{H30^+} (B) \xrightarrow{PCI5} (C)$
Product (C) is:
(a) chloro acetic acid (b) a-chlorocyano ethanoic acid
(c) acetylchloride (d) none of these

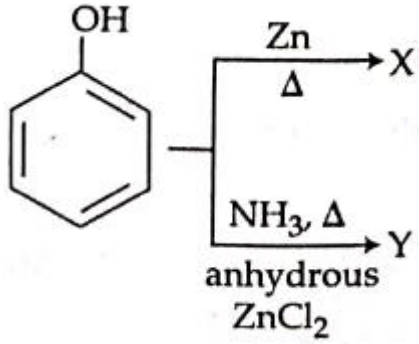
15. **Extraction of gold and silver involves leaching with cyanide ion. Silver is later recovered by:**
(a) Displacement with Zinc (b) Distillation
(c) Liquation (d) Zone refining

PART - II

Note: Answer **any six** questions. Question **No. 24 is compulsory.** **6x2=12**

16. Which type of ores can be concentrated by froth floatation method? Give an example for ores.
17. What happens when PCI, is heated?
18. Why do Zirconium and Hafnium exhibit similar properties?
19. Define Solubility Product.

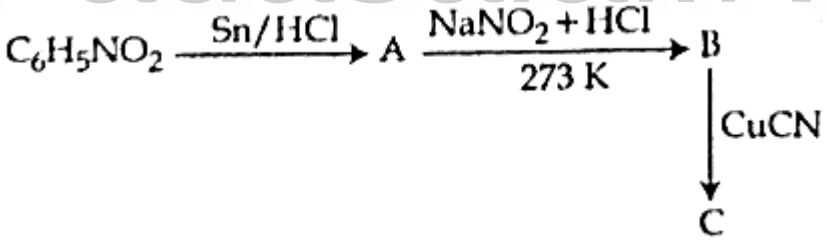
20. Define Equivalent Conductance.
21. Peptising agent is added to convert precipitate into colloidal solution. Explain this statement with an example.
22. Write Gattermann Koch reaction.
23. How are drugs classified?
24. Find the products X and Y in the following reactions.



PART – III

Note: Answer **any six** questions. Question **No. 33 is compulsory.** **6x3=18**

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

PART - IV

Note: Answer **all** the questions. **5x5=25**

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 0.1 M CH_3COOH solution. Dissociation constant of acetic acid is $1.8x10^{-5}$.

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

OR

(b) How will you convert
(i) Ethyl alcohol → Ethene
(ii) Ethylene glycol 1,4-dioxane
(iii) Glycerol→ Acrolein

38. (a) An organic compound (A) of molecular formula C_7H_6O undergoes Cannizaro reaction. Compound (A) also reacts with Chlorine in the presence of Conc. FeCl3 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 acid form Of $CH3NO_2$?
(ii) What are the types of RNA which are found in cell?

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