

HSS

## HALF YEARLY EXAMINATION - 2024

12 - Std

## CHEMISTRY

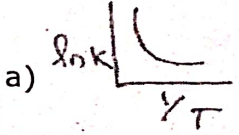

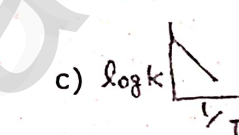
Time : 3.00 hrs.

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Marks : 70

**I Note : i) Answer all the questions. ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

15 X 1 = 15

- Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
  - Fe
  - Cu
  - Mg
  - Zn
- Which of the following is not  $sp^2$  hybridised?
  - Graphite
  - Graphene
  - Fullerene
  - Dry ice
- Formula for hyponitrous acid
  - HOONO
  - $H_2N_2O_2$
  - $HNO_2$
  - $HNO_4$
- The actinoid elements which show the highest oxidation state of +7 are
  - Np, Pu, Am
  - U, Fm, Th
  - U, Th, Md
  - Es, No, Lr
- How many geometrical isomers are possible for  $[Pt(Py)(NH_3)(Br)(Cl)]$ 
  - 3
  - 4
  - 0
  - 15
- The yellow colour in NaCl crystal is due to
  - excitation of electrons in F centers
  - Reflection of light from Cl ion on the surface
  - refraction of light from  $Na^+$  ion
  - all of these
- Among the following graphs showing variation of rate constant with temperature (T) for a reaction, the one that exhibits Arrhenius behaviour over the entire temperature range is
  - 
  - 
  - 
  - both (b) and (c)
- How many Faradays of electricity are required for the following reaction to occur  $MnO_4^- \rightarrow Mn^{2+}$ 
  - 5F
  - 3F
  - 1F
  - 7F
- Which one of the following is correctly matched?
  - Emulsion - Smoke
  - Gel - butter
  - Foam - Mist
  - Whipped cream - Sol
- Williamson synthesis of preparing dimethyl ether is a
  - $SN^1$  reaction
  - $SN^2$  reaction
  - electrophilic addition
  - electrophilic substitution
- Which one of the following reduces tollens reagent
  - formic acid
  - acetic acid
  - benzophenone
  - none of these

12. The product formed by the reaction an aldehyde with a primary amine  
 a) carboxylic acid      b) aromatic acid      c) Schiff's base      d) Ketone
13. Which of the following base is not present in DNA?  
 a) Uracil      b) Adenine      c) Cytosine      d) Guanine
14. Aspirin is a  
 a) Acetyl salicylic acid      b) Benzoyl salicylic acid  
 c) Chlorobenzoic acid      d) Anthranilic acid
15. Conjugate acid of  $NH_2^-$  is      a)  $NH_4^+$       b)  $NH_3$       c)  $NH_2$       d)  $NH$

**II Answer any six only. Answer Q.No. 24 is compulsory.**

6 X 2 = 12

16. What is auto reduction? Give example.
17. Give the uses of Helium.
18. Calculate the number of atoms in a fcc unit cell.
19. Define Activation Energy.
20. Differentiate sol and gel.
21. Write the preparation of picric acid.
22. What is Formalin? Write its use.
23. Transition elements show high melting points. Why?
24.  $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{HNO_2} B$ . Identify A and B.

**III Answer any six only. Answer Q.No. 33 is compulsory.**

6 X 3 = 18

25. How bleaching power is prepared?
26. What are interstitial compounds? Give example.
27. Give the differences between double salt and coordination compounds.
28. Explain Pseudo first order reaction with an example.
29. What is common ion effect? Give example.
30. Write a note on Lithium - ion battery.
31. Write a short note on peptide bond.
32. What are food preservatives? Give example.
33. How are the following conversions effected?  
 i) Phenylmethanal  $\rightarrow$  benzoic acid.  
 ii) Phenylmethanal  $\rightarrow$  benzoin.

**IV Answer all the questions:**

5 X 5 = 25

34. a) Explain zone refining process with an example. (OR)  
 b) i) How will you identify ethyl borate test. ii) What is catenation?
35. a) Write the postulates of Werner's theory. (OR)  
 b) Derive an expression for Oswald's dilution law.
36. a) Explain intermediate compound formation theory of catalysis with an example.  
 (OR) b) i) What are point defects?  
 ii) Differentiate - Tetrahedral voids and octahedral voids.
37. a) How will you distinguish between primary, secondary and tertiary amines. (OR)  
 b) Explain the structural elucidation of Fructose.
38. a) Derive Nernst equation. (OR)      b) A organic compound  $C_2H_6O$ (A) heated with conc  $H_2SO_4$  at 443K to give an unsaturated hydrocarbon  $C_2H_4$ (B), which on treatment with Bayer's reagent to give compound (C)  $C_2H_6O_2$ . Which is used as antifreeze in automobile radiator. Identify compounds A,B and C. Write the equations.