FY-425

Reg. No :

Name :

FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH — 2024

Part

CHEMISTRY

Maximum : 60 Scores

Time : 2 Hours

Cool-off time : 15 Minutes

General Instructions to Candidates :

- **There is a 'Cool-off time' of 15 minutes in addition to the writing time.**
- **Use the 'Cool-off time' to get familiar with questions and to plan your answers.**
- **Read questions carefully before answering.**
- **Read the instructions carefully.**
- **Calculations, figures and graphs should be shown in the answer sheet itself.**
- **Give equations wherever necessary.**
- **Electronic devices except non-programmable calculators are not allowed in the Examination Hall.**

Answer any 4 questions from 1 to 5. Each carries 1 score. (4 X 1 = 4)

1. The. number of moles of solute in one litre of the solution is
   (a) Molarity (b) Molality
   (c) Normality (d) Mole fraction

2. The element with outer electronic configuration $3s^2 3p^3$ belong to which block of the periodic table ?

3. The hybridisation of carbon in Ethyne molecule is

4. Which among the following is a Lewis acid ?
   (a) CH_4 (b) BF_3
   (c) PCl_5 (d) NH_3

5. Which among the following is a group showing + R effect ?
   (a) -CN (b) -O
   (c) -NO (d) -COOH

Answer any 8 questions from 6 to 15. Each carries 2 scores.(8 x 2 = 16)

6. Hydrogen combines with oxygen to form two different compounds. H,0 and H,0).
   (i) Which law is obeyed by this combination ? (1)
   (ii) State the law mentioned above. (1)

7. Dual nature of matter was proposed by Louis de Broglie. Calculate the de Broglie wavelength associated with an electron with velocity 1.6×10^6 m/s. (2)

8. Heisenberg's uncertainty principle rules out the existence of definite path fig electrons. State Heisenberg's uncertainty principle with equation. (2)

9. OF, and NH, are polar molecules. The Dipole moment of NF_3, is less than that of NH_3 Why ? (2)

10. The spontaneity of a process is expressed in terms of Gibb's energy.
    (i) Define Gibb's energy.
    (ii) Write Gibb's equation

11. (i) Le-chatelier principle helps to maximise the conversion of reactants to products. State Le-chatelier's principle. (1)
    (ii) Explain common ion effect. (1)

12. (i) Find the oxidation number of chlorine $HClO_4$
    (ii) Explain oxidation and reduction in terms of the oxidation number.

13. Give the structures of the following compounds
    (i) 3-Ethy1-2,2-dimethyl pentane
    (ii) Pent-4-en-2-ol

14. Draw the cis and trans isomers of But-2-ene.

15. Complete the following :
    (i) $3CH \equiv CH \xrightarrow[873\ k]{\text{Red Hot Iron Tube}}$ ____
    (ii) How alkanes are prepared by Wurtz reaction

Answer any 8 questions from 16 to 26. Each carries 3 scores. (8 x 3 = 24)

16. (i) Classify the following as homogeneous mixture, heterogeneous mixture, element and compound :
    (a) Silver (b) Air (c) Muddy water (d) Water

(ii) Define Limiting Reagent of a reaction

17. (i) Write the names of four quantum numbers.
(ii) State Pauli's exclusion principle.

18. (i) Write the IUPAC name of the element with atomic number 105.
(ii) Define eleetronegativity.
(iii) Chlorine atom has high electron gain enthalpy than fluorine atom.

19. (i) Write the general outer electronic configuration of transition metals.
(ii) Mention two properties of transition metals.

20. Give three salient features of molecular orbital theory.

21. (i) State first law of thermodynamics. Write its mathematical expression. (2)
(ii) Which of the following is a process taking place with increase in entropy ?
(a) Freezing of water
(b) Condensation of steam
(c) Evaporation of water (1)

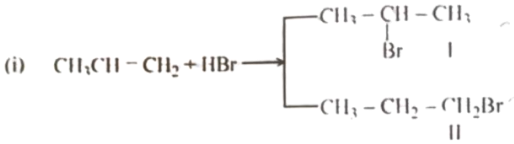
22. (i) Define pH scale.
(ii) The pKa of acetic acid and pith of ammonium hydroxide are 4.76 and 4.75 respectively.
Calculate the pH of ammonium acetate solution.

23. (i) Describe disproportionation reaction with an example. (2)
(ii) Write the stock notation of the compound CuO. (1)

24. (i) What is Hetcrolytic fission ? (1)
(ii) Write any one type of adsorption chromatography. (1)
(iii) Name the purification method used to separate the components of crude petroleum. (1)

25. (i) Draw the Newman's projections for the staggered and eclipsed conformation of ethane. (2)
(ii) Which conformation of ethane is more stable ? (1)

26.



(ii) Name the rule that decides the formation of major product.

27. (i) Explain Bohr model of Hydrogen atom
(ii) Write any two drawbacks of Rutherford model of atom.
(iii) What is Photoelectric effect ?

28. Match The Molecules in Column-I with their shape in Column-II

Column I	**Column II**
(I) PC13	(D) Tetrahedral
(ii) SF_6	(C) Octahedral
(III) CH4	(A) Trigonal Pyramidal
(IV) NH3	(B) Trigonal Bipyramidal

(ii) Define Bond order of a molecule.
(iii) Mention the two types of Hydrogen Bonding.

29. (i) Define Lattice enthalpy. (1)
(ii) Construct an enthalpy diagram for the determination of lattice enthalpy of sodium chloride. (3)

30. (i) What are Buffer Solutions ?. Give an example for Butler solution.
(ii) Explain Bronsted-Lowry concept of acids and bases.
(iii) Write the relation between K_p and $\mathbf{K_c}$?

31. (i) Differentiate Electrophile and Nucleophile. Give one example for each. (2)
(ii) Explain the following:
(a) Functional group isomerism
(b) Metamerism (2)
