SALEM DISTRICT

QL   **QUARTERLY COMMON EXAMINATION - 2024**

11 - Std   **CHEMISTRY**
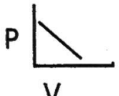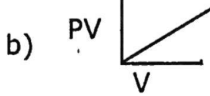
Time : 3.00 Hrs.   MARKS : 70

PART - I

I   **Answer all the questions. Choose the correct answer with correct option code.**

1. Which one of the following is used as a standard for atomic mass   15 X 1 = 15

   a) $_6C^{12}$ b) $_7C^{12}$ c) $_6C^{13}$ d) $_6C^{14}$

2. Two electrons occupying the same orbital are distinguished by
   a) azimuthal quantum number   b) spin quantum number
   c) Magnetic quantum number   d) orbital quantum number

3. Which of the following elements will have the highest electronegativity?
   a) Chlorine   b) Nitrogen   c) Cesium   d) Fluorine

4. What would be the IUPAC name for an element with atomic number 111?
   a) un unnilium   b) un untrium   c) unununium   d) unnilunium

5. Water is a
   a) basic oxide   b) acidic oxide   c) amphoteric oxide   d) none of these

6. Which of the following diagrams correctly describes the behaviour of a fixed mass of an ideal gas? (T is measured in K)

   a)   b)   c)   d) All of these

7. Critical temperature of CO_2 is ....
   a) 32.1° C   b) 31.1° C   c) 36.1° C   c) 30.1° C

8. Which of the following is not a thermodynamic function?
   a) internal energy   b) enthalpy   c) entropy   d) frictional energy

9. The bond dissociation energy of methane and ethane are 360KJ mol^{-1} and 620KJ mol^{-1} respectively. Then, the bond dissociation energy of C-C bond is ....
   a) 170KJmol^{-1} b) 50KJmol^{-1} c) 80KJmol^{-1} d) 220 KJmol^{-1}

10. In which of the following equilibrium, K_p and K_c are not equal?

    a) $2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$ b) $SO_{2(g)} + NO_{2(g)} \rightleftharpoons SO_{3(g)} + NO_{(g)}$

    c) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ d) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

11. Which one of the following is incorrect statement?
    a) for a system at equilibrium, Q is always lass than the equilibrium constant.
    b) equilibrium can be attained from either side of the reaction.
    c) presence of catalyst affects both the forward reaction and reverse reaction to the same extent d) equilibrium constant varied with temperature

12. Which of the following compounds does not show metamerism?
    a) Ethers   b) Ketones   c) Esters   d) Alcohols

13. The purity of an organic compound is determined by   a) chromatography
    b) crystallisation   c) melting or boiling point   d) both (a) and (c)

14. **Assertion :** Tertiary carbocations are generally formed more easily than primary carbocations ions.
    Reason : Hyper conjugation as well as inductive effect due to additional alkyl group stabilize tertiary carbonium ions.

a) both assertion and reason are true and reason is the correct explanation of assertion.   b) both assertion and reason are true but reason is not the correct explanation of assertion

c) assertion is true but reason is false   d) both assertion and reason are false

15. The geometrical shape of carbocation is
    a) Linear   b) Tetrahedral   c) Planar   d) Pyramidal
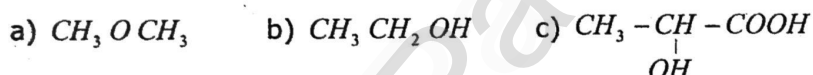
PART - II

II   Answer any six from the following. Q.No. 24 is compulsory.   6 X 2 = 12

16. Define mole concept.
17. Write the limitations of Bohr's atom model.
18. State modern periodic law.
19. Write the uses of heavy water.
20. What is compressibility factor Z?
21. State first law of thermodynamics.
22. Define optical isomerism.
23. What is inductive effect?
24. What is the effect of added inert gas on the reaction at equilibrium?

PART - III

III   Answer any six from the following. Q.NO. 33 is compulsory.   6 X 3 = 18

25. Differentiate between oxidation and reduction.
26. State Hund's rule of maximum multiplicity.
27. What is diagonal relationship?
28. What are isotopes? Write the names of isotopes of hydrogen.
29. Derive ideal gas equation.
30. Define extensive and intensive property with example.
31. State Le Chatlier's principle.
32. Write about resonance.
33. Give IUPAC name for the following.

    a) $CH_3 O CH_3$ b) $CH_3 CH_2 OH$ c) $CH_3 - \underset{\underset{OH}{|}}{CH} - COOH$

PART - IV

IV   Answer all the questions.   5 X 5 = 25

34. a) An acid found in tamarinds on analysis shows the following percentage composition. 32% Carbon, 4% Hydrogen, 64% Oxygen. Find the empirical formula of the compound. **(OR)**
    b) i) Derive De Broglie relation. ii) Which quantum number reveal information about the shape, energy, orientation and size of orbitals?

35. a) i) What are isoelectronic species? Give one example. ii) Explain the periodic trend of ionisation potential. **(OR)**
    b) i) What are ortho and para hydrogen?
    ii) How do you convert para hydrogen into ortho hydrogen?

36. a) Derive the values of critical constants in terms of Vander Waals constants. **(OR)**
    b) List the characteristics of internal energy.

37. a) Derive the relationship between K_p and K_c. **(OR)**
    b) Describe the classification of organic compounds based on their structure.

38. a) Explain various types of constitutional isomerism in organic compounds. **(OR)**
    b) Write the differences between electrophiles and nucleophiles with suitable examples.