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Time : 1.30 Hrs.

First Mid-Term Test - 2024
CHEMISTRY
PART - I

Register No.

Marks : 50

Answer all the questions.   **10 x 1 = 10**

1. The equivalent mass of a trivalent metal atom is 9 gram/eq. The molar mass of its anhydrous oxide is
   a) 102 g   b) 27g   c) 270 g   d) 78 g

2. Which one of the following is used a standard for atomic mass?
   a) $_6C^{12}$ b) $_7C^{12}$ c) $_6C^{13}$ d) $_6C^{14}$

3. Assertion : The spectrum of He^+ is expected to be similar to that of hydrogen.
   Reason : He^+ is also one electron system.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) If assertion is true but reason is false.
   d) If both assertion and reason are false.

4. The maximum no of electrons in a sub shell is given by the expression
   a) $2n^2$ b) $2\ell + 1$ c) $4\ell + 2$ d) none of these

5. Rate of diffusion of a gas is
   a) directly proportional to its density.
   b) directly proportional to its molecular weight.
   c) directly proportional to its square root of its molecular weight.
   d) inversely proportional to the square root of its molecular weight.

6. Uses of hot air balloons in sports, at meterological observation is an application for
   a) Boyle's law   b) Newton's law   c) Kelvin's law   d) Brown's law

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

8. The correct thermodynamic conditions for the spontaneous reaction at all temperature
   a) $\Delta H < 0$ and $\Delta S > 0$ b) $\Delta H < 0$ and $\Delta S < 0$ c) $\Delta H > 0$ and $\Delta S = 0$ d) $\Delta H > 0$ and $\Delta S > 0$

9. Which one of the following shows functional isomerism.
   a) ethylene   b) propane   c) ethanol   d) CH_2Cl_2.

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

PART - II
                                                                5 x 2 = 10

Answer any five questions.

11. Define Gram equivalent mass.

12. What do you understand by the term mole.

13. State Pauli's exclusion principle.

14. How many orbitals are possible for n = 4?

15. Name two items that can serve as a model for Gay Lusaac's law.

16. What are ideal gases? In what way real gases differ from ideal gases.

17. Explain intensive properties with two examples.

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PART - III

Answer any five questions.   5 x 3 = 15

18. Write notes on homologus series.
19. Identify the functional groups of the following compounds.
    a) Acetaldehyde   b) Carboxylic acid   c) Amine
20. Derive de-Broglie equatoin?
21. Define orbital. What are 'n' and 'ℓ' values for 3px and 4dx² – y² electron.
22. State Dalton's law of partial pressure.
23. Distinguish between Diffusion and Effusion.
24. What are state and path function? Give two examples.

PART - IV

Answer all the questions.   3 x 5 = 15

25. a) Calculate the empirical formula of a compound containing 76.6% carbon, 6.38% hydrogen and 17.02% oxygen.

    (OR)

    b) i) State Heisenberg's uncertainity principle.

    ii) Limitation of Bohr's model of atom.

26. a) i) Derive ideal gas equation.

    ii) State Graham's law of diffusion.

    (OR)

    b) What are the characteristic features of internal energy.

27. a) Write notes on

    i) Principal quantum number

    ii) Magnetic quantum number

    (OR)

    b) i) Write notes on Cis-trans isomerism with an example.

    ii) Write the IUPAC name of the following compounds.

    a) CH_3CHO b) CH_3CH_2OH

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