LAQ's (8 Marks Questions)

ATOMIC STRUCTURE

1. How are the quantum numbers n, l, and m arrived at? Explain the significance of these quantum numbers?
2. What are the postulates of Bohr's model of hydrogen atom? Discuss the importance of this model to explain various series of line spectra in hydrogen atom?

PERIODIC CLASSIFICATION

3. Write an essay on s, p, d and f block elements?
4. Define IE_1 and IE_2. Why is $IE_2 > IE_1$ for a given atom? Discuss the factors that affect IE of an element?
5. What is a periodic property? How do the following properties vary in a group and in a period? Explain:
    - (a) Atomic radius
    - (b) IE (Ionization Energy)
    - (c) EN (Electronegativity)
    - (d) Electron gain enthalpy
    - (e) Nature of oxides

SAQ's (4 Marks Questions)

ATOMIC STRUCTURE

1. Explain the difference between emission and absorption spectra?
2. What are merits and limitations of Bohr's model of an atom?
3. What is Aufbau, Hund's, Pauli's exclusion principle?
4. Explain De Broglie's theory?
5. Explain photoelectric effect?

PERIODIC CLASSIFICATION

4. What is lanthanide contraction? What are its consequences?
5. What is diagonal relationship? Give example?
6. Write characteristic properties of transition elements?

STOICHIOMETRY

18. Chemical analysis of a carbon compound gave the following percentage composition by weight of the elements present. Carbon = 10.06%, hydrogen = 0.84%, chlorine = 89.10%. Calculate empirical formula?
19. Calculate the empirical formula of a compound having percentage composition: K = 26.57%, Cr = 35.36%, O = 38.07%
20. A carbon compound contains 12.8% carbon, 2.1% hydrogen, 85.1% bromine. The molecular weight of the compound is 187.9. Calculate molecular formula?
21. Balance the following (reaction) redox reactions by ion electron method.
$MnO_4^-(aq) + SO_2(g) \rightarrow Mn^{2+}(aq) + HSO_4^-$ (In acidic medium)
22. Balance the following (reaction) redox reactions by ion electron method.
$Cr_2O_7^{2-}(aq) + SO_2(g) \rightarrow Cr^{3+}(aq) + SO_4^{2-}(aq)$ (In acidic medium)
23. Balance the following (reaction) redox reactions by ion electron method.
$MnO_4^-(aq) + I^-(aq) \rightarrow MnO_2(s) + I_2(g)$ (In basic medium)
24. Balance the following (reaction) redox reactions by ion electron method.
$P_4(ortho) \rightarrow PH_3 + H_2PO_2^-$ (In basic medium)

Atomic Structure (VSAQs)

1. What is the frequency of radiation of wavelength 600 nm?
2. What is Zeeman effect?
3. What is Stark effect?
4. Calculate the charge of one mole of electrons.

Classification of Elements (VSAQs)

1. What are representative elements? Give their valence shell configuration.
2. Give the outer shell configuration of d-block and f-block elements.
3. Electron affinity of chlorine is more than that of fluorine. Why?
4. What is diagonal relationship? Give example.

Stoichiometry

1. How many moles of glucose are present in 540g of glucose?
2. Calculate the weight of 0.1 mole of sodium carbonate.
3. The empirical formula of a compound is CH_2O; its molecular weight is 90. Calculate molecular formula of compound.
4. What are disproportionation reactions? Give examples.
5. What are comproportionation reactions? Give examples.
6. How many significant figures are present in the following:
   a) 0.0025
   b) 208
   c) 5005
   d) 126000
   e) 500.0
   f) 2.0034
7. Calculate the oxidation numbers of the underlined elements in the following:
   a) $KMnO_4$
   b) $Cr_2O_7^{2-}$
   c) C_2H_4O
   d) CrO_5
   e) $H_2S_2O_6$
   f) H_2SO_5
8. What is oxidation state of Nitrogen in NH_4NO_3?
9. What is a redox concept? Give example.
10. Calculate the volume of O_2 at S.T.P required to completely burn 100 ml of acetylene.
11. What do you mean by significant figures?

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