ST. JOSEPH STUDY CENTRE

11th STD: Quarterly Exam **CHEMISTRY** **Time: 2 Hrs / Total Marks: 70**

I. Choose The Correct Answer: [15 x 1 = 15]

1. The equivalent mass of a trivalent metal element is 9 g eq^{-1} the molar mass of its anhydrous oxide is
   a) 102 g b) 27 g c) 270 g d) 78 g
2. The number of water molecules in a drop of water weighing 0.018 g is
   a) 6.022×10^{26} b) 6.022×10^{23} c) 6.022×10^{20} d) 9.9×10^{22}
3. Total number of electrons present in 1.7 g of ammonia is
   a) 6.022×10^{23} b) $\frac{6.022 \times 10^{22}}{1.7}$ c) $\frac{6.022 \times 10^{24}}{1.7}$ d) $\frac{6.022 \times 10^{23}}{1.7}$
4. According to the Bohr Theory, which of the following transitions in the hydrogen atom will give rise to the least energetic photon?
   a) n = 6 to n = 1 b) n = 5 to n = 4 c) n = 5 to n = 3 d) n = 6 to n = 5
5. The maximum number of electrons in a sub shell is given by the expression
   a) $2n^2$ b) 2l + 1 c) 4l + 2 d) none of these
6. 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
7. For d-electron, the orbital angular momentum is
   a) $\frac{\sqrt{2}\,h}{2\pi}$ b) $\frac{\sqrt{2h}}{2\pi}$ c) $\frac{\sqrt{2 \times 4}\,h}{2\pi}$ d) $\frac{\sqrt{6}\,h}{2\pi}$
8. Which of the following elements will have the highest electronegativity?
   a) Chlorine b) Nitrogen c) Cesium d) Fluorine
9. Which one of the following is the least electronegative element?
   a) Bromine b) Chlorine c) Iodine d) Hydrogen
10. The element with positive electron gain enthalpy is
    a) Hydrogen b) Sodium c) Argon d) Fluorine
11. Water gas is
    a) H_2O (g) b) CO + H_2O c) CO + H_2 d) CO + N_2
12. Ionic hydrides are formed by
    a) halogens b) chalcogens c) inert gases d) group one elements
13. Non-stoichiometric hydrides are formed by
    a) palladium, vanadium b) carbon, nickel c) manganese, lithium d) nitrogen, chlorine
14. sodium is stored in
    a) alcohol b) water c) kerosene d) none of these
15. The value of the gas constant R is
    a) 0.082 dm^3atm. b) 0.987 cal mol^{-1} K^{-1} c) 8.3 J $mol^{-1}K^{-1}$ d) 8 erg $mol^{-1}K^{-1}$

II. Answer any 6 of the following questions: [6 x 2 = 12]

Question number 18 is compulsory

16. Define equivalent mass.
17. What do you understand by the term mole?
18. Calculate the molar mass of urea [$CO(NH_2)_2$].
19. How many orbitals are possible for n =4?
20. Define orbital.
21. Define modern periodic law.
22. What is effective nuclear charge?
23. What is screening effect?
24. What is water-gas shift reaction?

III. Answer any 6 of the following questions: **[6 x 3 = 18]**

Question number 28 is compulsory

25. What is the empirical formula of the following?
    i) Fructose ($C_6H_{12}O_6$) found in honey
    ii) Caffeine ($C_8H_{10}N_4O_2$) a substance found in tea and coffee.
26. How many moles of ethane is required to produce 44 g of CO_2 (g) after combustion.
27. State and explain Pauli Exclusion Principle.
28. Describe the Aufbau principle.
29. What are isoelectronic ions? Give examples.
30. Define electronegativity.
31. Do you think that heavy water can be used for drinking purposes?
32. Mention the uses of deuterium.
33. Why sodium hydroxide is much more water soluble than sodium chloride?

IV. Answer the following questions: **[5 x 5 = 25]**

34. a) i) Calculate the molar mass of the following compounds Acetone [CH_3COCH_3]. [3]
    ii) Distinguish between oxidation and reduction. [2]

    [OR]

    b) i) The density of carbon dioxide is equal to 1.965 kgm^{-3} at 273 K and 1 atm pressure. Calculate the molar. [3]
    ii) Define relative atomic mass. [2]

35. a) i) Which quantum number reveal information about the shape, energy, orientation and size of orbitals? [3]
    ii) Calculate the uncertainty in position of an electron, if $\Delta v = 0.1\%$ and $\upsilon = 2.2 \times 10^6$ ms^{-1}. [2]

    [OR]

    b) i) Explain the diagonal relationship. [3]
    ii) Why halogens act as oxidising agents? [2]

36. a) i) Briefly give the basis for Pauling's scale of electronegativity. [3]
    ii) State the trends in the variation of electronegativity in group and periods. [2]

    [OR]

    b) i) Explain why hydrogen is not placed with the halogen in the periodic table. [3]
    ii) Complete the reactions $KMnO4 + H_2O_2 \rightarrow$? [2]

37. a) i) Compare the structures of H_2O and H_2O_2. [2]
    ii) Differentiate ortho and para hydrogen. [3]

    [OR]

    b) i) Mention the uses of plaster of Paris. [3]
    ii) How is plaster of paris prepared? [2]

38. a) i) Describe briefly the biological importance of Calcium and magnesium. [3]
    ii) Why alkaline earth metals are harder than alkali metals. [2]

    [OR]

    b) i) Distinguish between diffusion and effusion. [3]
    ii) State Avogadro's hypothesis. [2]

----------ALL THE BEST----------