11TH CHEMICAL CALCULATIONS 70MARKS TEST

CHEMISTRY

Time : 3 Hour **Max. Marks : 70**

Part – A **(15 X 1 = 15)**

Answer all the questions

1. Carbon forms two oxides, namely carbon monoxide and carbon dioxide. The equivalent mass of which element remains constant?
   a) carbon b) oxygen c) both carbon and oxygen d) neither carbon nor oxygen
2. 7.5 g of a gas occupies a volume of 5.6 litres at 0°C and 1 atm pressure. The gas is
   a) NO b) N_2O c) CO d) CO_2
3. What is the mass of precipitate formed when 50 ml of 8.5 % solution of $AgNO_3$ is mixed with 100 ml of 1.865% potassium chloride solution?
   a) 3.59 g b) 7 g c) 14 g d) 28 g
4. Which of the following compound(s) has /have percentage of carbon same as that in ethylene (C_2H_4)
   a) Propane b) ethyne c) benzene d) ethane
5. Which one of the following is used as a standard for atomic mass.
   a) $6C_{12}$ b) $7C_{12}$ c) $6C_{13}$ d) $6C_{14}$
6. Rusting of iron articles is an example of reaction
   a) combustion b) decomposition c) redox d) hydrolysis
7. Which form of based on physical characteristics posses neither definite volume nor definite shape?
   a) Solids b) Liquids c) Gases d) Both (a) and (b)
8. 40 ml of methane is completely burnt using 80 ml of oxygen at room temperature. The volume of gas left after cooling to room temperature is
   a) 40 ml CO_2 gas b) 40 mlCO_2 gas and 80 ml H_2O gas
   c) 60 ml CO_2 gas and 60 ml H_2O gas d) 120 ml CO_2 gas
9. 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
10. When 22.4 litres of H_2(g) is mixed with 11.2 litres of Cl_2(g), each at 273 K at 1 atm the moles of $HCl_{(g)}$, formed is equal to
    a) 2 moles of $HCl_{(g)}$ b) 0.5 moles of $HCl_{(g)}$ c) 1.5 moles of $HCl_{(g)}$ d) 1 moles of $HCl_{(g)}$
11. Which one of the following represents 180 g of water?
    a) 5 moles of water b) 90 moles of water
    c) $\frac{6.022\ X\ 10^{23}}{180}$ molecules of water d) 6.022 x 10^{24} molecules of water
12. If the relative atomic mass of chlorine is 35.46 u and the percentage abundance of $_{17}Cl^{37}$ is 77%, then the percentage adundance of $_{17}Cl^{37}$ is
    a) 36% b) 23 % c) 32 % d) 45 %
13. The number of oxygen atoms in 4.4 g of CO_2 is
    a) 1. 2 x 10^{23} b) 6 x 10^{22} c) 6 x 10^{23} d) 12 x 10^{23}
14. An organic compound containing C, H and N gave the following analysis: C = 40%; H = 13.33%; N= 46.67%. Its empirical formula would be
    a) $C_7H_7N_2$ b) CH_5N c) CH_4N d) C_2H_7N
15. Which has the maximum number of molecules among the following?
    a) 44g CO_2 b) 48g O_3 c) 8 g H_2 d) 64 g SO_2

Part – B **(6 X 2 = 12)**

Answer any 6 questions & question no 18 is compulsory

16. State Avogadro's hypothesis.
17. Calculate the molar mass of the following compounds.
    i. Urea $[CO(NH_2)_2]$ ii. Acetone $[CH_3COCH_3]$
18. Mass of one atom of an element is 6.645×10^{-23} g. How many moles of element are there in 0.320 kg.
19. 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.
20. How many moles of hydrogen is required to produce 10 moles of ammonia? 21. Calculate the oxidation number of Cr in $Cr_2O_7^{-2}$
22. Define relative atomic mass.
23. What do you understand by the term oxidation number?
24. Calculate the relative molecular mass of glucose.

Part – C **(6 X 3 = 18)**

Answer any 6 questions & question no 27 is compulsory

25. The balanced equation for a reaction is given below
    a) $2x + 3y \rightarrow 4l + m$
    b) When 8 moles of x react with 15 moles of y, then
        i. Which is the limiting reagent?
        ii. Calculate the amount of products formed.
        iii. Calculate the amount of excess reactant left at the end of the reaction.
26. Calculate the percentage composition of the elements present in magnesium carbonate. How many kilogram of CO_2 can be obtained by heating 1 kg of 90% pure magnesium carbonate.
27. An organic compound present in vinegar has 40% carbon, 6.6 % hydrogen and 53.4 % oxygen. Find the empirical formula of the compound.
28. What is the condition for molar volume?
29. What is the difference between molecular mass and molar mass? Calculate the molecular mass and molar mass for carbon monoxide.
30. Hydrogen peroxide is an oxidising agent. It oxidises ferrous ion to ferric ion and reduced itself to water. Write a balanced equation.
31. How many moles of ethane is required to produce 44 g of CO_2(g) after combustion.
32. Calculate the gram equivalent mass of sulphuric acid.
33. Calculate gram equivalent mass of $Al(OH)_3$.

Part – D **(5 X 5 = 25)**

Answer all the questions

34. Write rules for assigning oxidation number.
35. Experimental analysis of a compound containing the elements x, y, z on analysis gave the following data. x = 3.2 %, y= 24 %, z = 44 %. The relative number of atoms of x, y, and z are 2, 1 and 0.5 respectively. (Molecular mass of the compound is 400 g). Find out i. The atomic masses of the element x, y, z. ii. Empirical formula of the compound and iii. Molecular formula of the compound.
36. Balance the following equations by oxidation number method
    i. $K_2Cr_2O_7 + KI + H_2SO_4 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + I_2 + H_2O$ ii. $KMnO_4 + Na_2SO_3 \rightarrow MnO_2 + Na_2SO_4 + KOH$
37. Balance the following equations by ion electron method.
    i. $KMnO_4 + SnCl_2 + HCl \rightarrow MnCl_2 + SnCl_4 + H_2O + KCl$ ii. $C_2O_4^{2-} + Cr_2O_7^{2-} \rightarrow Cr^{3+} + CO_2$ (in acid medium)
38. Balance the following equation using oxidation number method.
    $AS_2S_3 + HNO_3 + H_2O \rightarrow H_3AsO_4 + H_2SO_4 + NO$

Prepared by Mr. A.Prabukumar M.sc.,B.ed.,
Chemistry
Lakshmi Matric Hr Sec school
Manapparai