1. Write the symbol of the elements given below.
      Sodium, Iron, Tellurium, Gold, Xenon, Uranium

2. Write the name of the elements given below.
      Cs, TH, Pb, Pt, Ag, Si

3. Write down two elements that exist in each block of the following.
      s-block, p-block, d-block, f-block

4. Write down two elements that exist in group of the following.
      group 1, group 3, group 10, group 17, group 18

5. Write down two elements that exist in eachperiod of the following.
      Period 1, period 2, period 3, period 4, period 7

6. Identify the period number and the group number of the elements given below.
      Li, Tc, Bi, I, Cu

7. Give the symbol of the element that is represented by the following period and group number.
      Period 3 and group 1, period 4 and group 7, period 2 and group 2, period 6 and group 16

8. Write down 3 examples for metalloids.

9. Write the atomic symbol of the elements given below.
      Fe, K, Se, F, Eu

10. An element "X" contains 8 protons and 8 electrons. Write the symbol of "X".

11. Complete the table given below by considering the isotopes of Chlorine.

| Isotope | No of electrons | No of protons | No of neutrons |
|---|---|---|---|
| $^{35}_{17}Cl$ | | | |
| $^{37}_{17}Cl$ | | | |

12. An element of "A" contains two isotopes which are having the atomic weights of 30 amu and 32 amu. The relative abundance of one isotope is 80%. Calculate the relative atomic mass (ram) of "A".

13. Find the value of atomic mass unit (amu).

14. The mass of an atom of Ag is $1.793 \times 10^{-25}$ kg. Calculate the ram of Ag

15. Give the electronic configuration of the following elements.
   K, Mg, Si, O, Ar

16. Indicate the number of valence electrons of the following elements.
   Na, Mg, B, Si, P

17. Write down two ions which attain the Argon configuration.

18. Write down two ions which attain the Neon configuration.

19. What is the ion which attains the Helium configuration?

20. Explain the formation of the ionic bonding of the compounds given below.
   $CaCl_2$, LiF

21. Draw the dot and cross diagram of the following and draw their structures.
   Water, Ammonia, Chlorine, Oxygen, Nitrogen

22. Calculate the relative molecular mass of the following.
   HBr, LiCl, $H_2SO_4$, $C_2H_5OH$, $NH_3$

23. Calculate the percentage by weight of the elements given in the brackets of the compounds given below.
   $CO_2$ (O), $H_2SO_4$ (H and S), $H_2O$ (O), $MgBr_2$ (Br), $C_2H_5OH$ (C and H)

24. A compound contains 84% C and H only by mass. Calculate the empirical formula.

25. A compound contains 57. 14% C, 40% N and H only by mass. Calculate the empirical formula.

26. A compound contains 9.44% H and C only by mass. The relative molecular mass of the compound is 100. Calculate the molecular formula.

27. A compound contains 40.01% C, 6.66% H and O only by mass. The relative molecular mass of the compound is 180. Calculate the molecular formula.

28. Write down the chemical formula of the following ionic compounds.
   sodium oxide, calcium bromide, aluminiumsulphide, magnesium fluoride, potassium iodide, zinc hydroxide, strontium cyanide, sodium perbromate, aluminiumsulphate, lithium hypoiodate, calcium carbonate, barium phosphate, sodium peroxide

29. Write down the name of the following ionic compounds.
   $MgI_2$, $CaSO_3$, KI, $Ba(ClO_3)_2$, $K_2O_2$, $KNO_3$, $ZnNO_2$, $Al(CN)_3$, AlN, $Li_2S$, $CaCl_2$

30. Write down the chemical formula of the following covalent compounds.

nitrogentetrabromide, phosphorous tribromide, nitrogen dioxide, diphosphorouspentaoxide, silicon tetrachloride, difluoro oxide, diborontrisulphide

31. Write down the name of the following covalent compounds.
    $NI_3$, $PCl_5$, $NO$, $N_2O_3$, $P_2S_3$, $SiF_4$, $I_2O$, $SF_6$, $SF_4$, $SF_2$

32. Name the following as acids.
    $HF$, $H_2SO_3$, $HBrO$, $HBrO_2$, $HBrO_3$, $HBrO_4$, $H_2CO_3$

33. Write an equation to show that ammonia acts as a base in an aqueous solution.
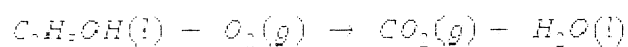
34. Write down three examples for combination reactions.

35. Write down three examples for decomposition reactions.

36. Write down three examples for single replacement reactions.

37. Write down three examples for double replacement reactions.

38. Balance the reactions given below.
$$C(s) - H_2(g) \rightarrow C_6H_6(l)$$
$$C_2H_5OH(l) - O_2(g) \rightarrow CO_2(g) - H_2O(l)$$
$$CH_4(g) - Cl_2(g) \rightarrow CCl_4(g) - HCl(g)$$
$$Al(s) - Cl_2(g) \rightarrow AlCl_3(s)$$

39. How many molecules/ions are present in the following?
    2 mol of $H_2O$, 3.125 mol of $C_2H_5OH$, 0.003 mol of $H_2$, 0.15 mol of NaCl

40. How many moles are present in the following?
    $1.5055 \times 10^{23}$ molecules of $NH_3$, $3.6132 \times 10^{21}$ ions of $Mg^{2+}$, $6.022 \times 10^{24}$ molecules of $Br_2$

41. How many moles are present in the following?
    4.32 g of $H_2O$, 51 g of $NH_3$, 28.52 g of $C_2H_5OH$, 0.0312 g of $C_6H_6$

42. How many moles of O and H are present in the following?
    9 g of $H_2O$, 0.046 g of $C_2H_5OH$, 24.4 g of $H_2SO_4$

43. Express the following as molar concentrations.
    43.1. 0.5 mol $cm^{-3}$ of $NH_3$
    43.2. 0.012 mol $m^{-3}$ of NaCl
    43.3. 5 mol $l^{-1}$ of $HNO_3$
    43.4. 200 ppm of NaOH

44. What is the mass required to prepare a 250.0 cm$^3$ of 0.05 mol dm$^{-3}$ $S_2O_3^{2-}$ solution from the salt $Na_2S_2O_3.5H_2O$.

45. How do you prepare a 500.0 cm$^3$ of 0.022 mol dm$^{-3}$ Cl- solution using a 0.44 mol dm$^{-3}$ $MgCl_2$ solution?

46. 0.12 g of metal Mg was reacted with 200 cm$^3$ of 0.5 mol dm$^{-3}$ diluted HCl.
    46.1. Write down the balanced equation with state symbols.
    46.2. Calculate the amounts of Mg and HCl.
    46.3. What is the limiting reagent?
    46.4. Calculate the mass of $H_2$ produced.
    46.5. Calculate the concentration of $MgCl_2$ in the mixture.
    46.6. If this solution was diluted up to 1000 cm$^3$, calculate the concentration of $Mg^{2+}$ in ppm.

47. Describe the way of preparation of 100.0 cm$^3$ of 6.0 mol dm$^{-3}$ HCl solution from a concentrated solution of HCl that has a specific gravity of 1.18 and 37% w/w.

48. Concentrated sulphuric acid as produced industrially often contains 98% $H_2SO_4$ by mass and has a density 1.92 g cm$^{-3}$.
    48.1. What is the concentration of $H_2SO_4$ in this acid solution?
    48.2. Calculate the volume required to prepare a 500.0 cm$^3$ of 1.00 mol dm$^{-3}$ $H_2SO_4$ solution from the given solution above.

49. Calculate the volume of pure ethanol ($C_2H_5OH$) that must be dissolved in water to produce exactly 250.0 cm$^3$ of 0.15 mol dm$^{-3}$ ethanol solution. The density of pure ethanol is 0.782 g cm$^{-3}$.

50. A salt solution is prepared by dissolving 50 g of salt in 400 g of water. Calculate the mass percentage of this solution.

51. What is the molarity of 50.0 g of KOH in 0.500 L of solution?

52. 100.0 grams of sucrose ($C_{12}H_{22}O_{11}$, mol. wt. = 342.3 g/mol) is dissolved in 1.50 L of water. What is the molality?

53. What is the weight/volume percentage concentration of 250mL of aqueous sodium chloride solution containing 5g NaCl?

54. 10.00g $BaCl_2$ is dissolved in 90.00g of water. The density of the solution is 1.09g/mL. Calculate the weight/volume percentage concentration of the solution.

55. Sodium hydroxide (NaOH) reacts with phosphoric acid ($H_3PO_4$) to form sodium phosphate ($Na_3PO_4$) and water ($H_2O$) by the reaction:

$$3\ NaOH(aq) + H_3PO_4(aq) \rightarrow Na_3PO_4(aq) + 3\ H_2O(l)$$
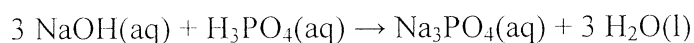
If 35.60 grams of NaOH is reacted with 30.80 grams of $H_3PO_4$,

a. How many grams of $Na_3PO_4$ are formed? b. What is the limiting reactant?
c. How many grams of the excess reactant remains when the reaction is complete?