Summer assignment-1

Std-11(SCIENCE)

1) State the law of multiple proportion. 1

2) Name the device where cathode ray experiment had been done. 1

3) Express 700000 up to five significant figures. 1

4) Write the nucleide symbol of an element X whose atomic number is 15 and mass number is 31. 1

5) What is the difference between 0.006 and 6.00×10^{-3} g? 1

6) The relative abundanceof various isotopes of silicon is as Si(28)=92.25%,Si(29)=4.65% and Si(30)=3.10%.Calculate the average atomic mass of silicon. 2

7) How many significant figures should be present in the answer of the following calculations? 2

i.6x6.695 ii.0.0125+0.7864+0.0215

8) What do you mean by the following statements? 2

i.Vapour density of chlorine is 35.5. ii.Molecular weight of $CaCO_3$ is 100.

9)Write any two drawbacks of Rutherford's atomic model. 2

10)Write any two postulates of Dalton's atomic theory which have been changed by Modern atomic theory. 2

11)a)Define limiting reagent. 3

b)50.0 kg of $N_2(g)$ and 10.0kg of $H_2(g)$ are mixed to produce NH_3 (g).

i.Calculate the $NH_3(g)$ formed.ii.Identify the limiting reagent in this reaction if only.

12)Balance the following reactions: 3

i.$KOH + Cl_2 \longrightarrow KCl + KClO_3 + H_20$

ii.$FeS_2 + O_2 \longrightarrow Fe_2O_3 + SO_2$

iii.$KMnO_4 + H_2S + H_2SO_4 \longrightarrow KHSO_4 + MnSO_4 + S + H_2O$

13) a)Calculate the mass percentage of various elements present in $MgSO_4$. 3

b) Calculate the percentage of cation in ammonium dichromate.

14) How can you prepare the following solutions ? 3

i. (N/10) 250 cc solution of oxalic acid ii. (M/20) 500 cc solution of Na_2CO_3 .

15)Calculate i.the number of electrons weighing 1g. ii.the mass and charge of 1 mole of electrons. 3

16)a)What is the significance of ψ and ψ^2 in Schordinger wave eqation ? 5

b)Name a phenomenon which can not be explained by the wave nature of light.

c)Yellow light emmited from sodium lamp has a wave length(λ) of 580nm.Calculate the frequency and wave number.

17)a)Calculate the number of molecules present in a spherical drop of water having a radius of 1mm if density of water is 1g/cc. 5

b)Ammonia may be oxidized to NO in presence of a catalyst in the following eqation-

$$4\,NH_3 + 5O_2 \xrightarrow[800^oc]{Pt} 4NO + 6\,H_2O$$

If 27 litres of reactants are consumed, what volume of NO is produced at the same temperature and pressure.

Summer assignment-2

Std-XI

1) How are 0.70 m NaOH and 0.70 M NaOH different? 1

2) Write the empirical formula of –i. glucose ii.sucrose 1

3) State the law of constant proportion. 1

4) Why do atomic masses of most of the elements fractional? 1

5) What is an α particle? 1

6) Differentiate between one gram atom and mass of one atom with proper example. 2

7) Define-i. Molarity ii. Normality 2

8) Which one of the following will have largest number of atoms ? 2

I.1 g Au ii.1 g Na iii. 1 g Li iv. 1 g Cl_2

9) How many molecules of aspirin (molar mass=180 amu) are present in 50 mg tablet? 2

10) From the following nuclei-i. 8p+8n ii.8p+9n iii.18p+22n iv.20p+20n , choose isotopes and isobars. 2

11)Write any three informations obtained from the balanced chemical equation: 3

$2KMnO_4 + 16HCl \longrightarrow 2KCl + 2MnCl_2 + 8H_2O + 5Cl_2$

12) a) State Gay- Lusaac's law. 3

b) What volume of oxygen at S.T.P is required for complete combustion of 200 cc of acetylene and what would be the volume of carbon-dioxide formed?

13) a)What do you mean by the statement that energy of the electron is quantized? 3

b) What is the energy of a photon of light having frequency $3.0 \times 10^{15}\ s^{-1}$?

(Planck's constant = 6.6×10^{-34} Js)

14) Commercially available concentrated hydrochloric acid contains 38% HCl by mass. 3

i.What is the molarity of the solution ?(density of solution =1.19 g mL^{-1})

ii.What volume of concentrated HCl is required to make 1.0 L of an 0.10 M HCl?

15) Discuss Avogadro's hypothesis and its important applications. 3

16)a) A sample of drinking water was found to be severely contaminated with chloroform which is carcinogenic in nature. The level of contamination was 15 ppm by mass. 5

i. Express this in percent by mass . ii. Determine the molarity of chloroform in the water sample.

b)Calculate the molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.040.

17)a)Give the number of electrons in the species H_2^+,H_2,O_2^+,He^{++}. 5

b)which of the following are isoelectronic species?

Na^+, K^+, Mg^{2+}, Ca^{2+}, S^{2-}, Ar

c)Give two examples from everyday life where cathode ray tubes are used.

Summer assignment-3

Std-11 (SCIENCE)

1) What do you mean by mole fraction? 1

2) What is the difference between 5.0 g and 5.00 g? 1

3) How many gram –atoms are present in 40 g of calcium? 1

4) How can you say that electron is a universal constituent of all atoms? 1

5) Define isotone with proper example. 1

6) Calculate the concentration of nitric acid in mol per litre in a sample which has a density 1.41 g/mL and the mass percent of nitric acid in it being 69%. 2

7) Write two points of difference between cathode ray and anode ray. 2

8) Why does the charge to mass ratio of positive rays depend on the residual gas in the discharge tube? Why is the charge to mass ratio of all cathode rays are same? 2

9) Calculate the number of gram of SO_2 which can be prepared by treatment of 100 gm of Na_2SO_3 with HCl.

10) 3 L of water is added to 2 L of 5 M HCl. What is the molarity of HCl in the resultant solution? 2

11) a) Volume of a solution changes with change in temperature, then will the molality of the solution be affected by temperature? Give reason for your answer.

b) What will be the molarity of 36 N H_2SO_4 ? 3

12) An element with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the atomic symbol of the element 3

13) a) How is mole defined? Give it's SI unit.

b) A black dot used as a full stop at the end of a sentence has a mass of about 1 attogram. Assuming that the dot is made up of carbon, calculate the approximate number of carbon atoms present in the dot. 3

14) Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 according to the reaction,

$$CaCO_3(s) + 2HCl(aq) \longrightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$$ 3

What mass of $CaCO_3$ is required to react completely with 25mL of 0.75M HCl?

15) Balance the following equations: 3

i. $S + HNO_3 \longrightarrow H_2SO_4 + NO_2 + H_2O$

ii. $Pb_3O_4 + HCl \longrightarrow PbCl_2 + Cl_2 + H_2O$

iii. $NH_3 + O_2 \longrightarrow NO + H_2O$

16) a) A flask P contains 0.5 mole of oxygen gas. Another flask Q contains 0.4 mole of ozone gas. Which of the two flasks contain greater number of oxygen atoms?

b) Calculate the total number of electrons in 1.6g of methane. 5

17) Which model is called planetary model ? Describe it. How does this model explain the results of alpha-particle scattering from metal foils? 5

N.B: SOLVE THE QUESTIONS FROM NCERT EXERCISE (CH-1) SEPARATELY