CLASS XI   Marks :25

Time : 1 Hour

General Instructions:
    a. All questions are compulsory.
    b. Mark for each question is indicated against it.

1.   State Avogadro law.   1

2.   Define   1
       i.   Wavelength   ii.   Frequency

3.   Write short note on Planck's quantum theory.   2

4.   Explain law of multiple proportion with suitable example   2

5.   a. 1L of a gas at STP weighs 1.97g. What is its molar mass?   2
      b. Calculate the mass percentage of Sulphur in H_2SO_4(RAM of S= 32u)

6.   a. What do you mean by mole fraction?   2
      b. Define Threshold energy.

7.   6.5g of Zn was reacted with excess of dil. HCl. Calculate   3
      a. the amount and volume of hydrogen produced at STP.
      b. The amount of HCl consumed.
         (RAM of Zn= 65u,Cl=35.5 u)

8.   A compound contains 4.07 % hydrogen, 24.27 % carbon and 71.65 % chlorine. Its molar   3
    mass is 98.96 g. Deduce its empirical and molecular formula.
    (RAM of H= 1 u ,O=16 u)

9.   A photon of wavelength 4.0×10^{-7}m strikes on metal surface, the work function of the metal   3
    being 2.13eV. Calculate
            a. Energy of photon (eV)
            b. The kinetic energy of the emission and
            c. The velocity of the photoelectron emitted.
              (1eV =1.602×10^{-19}J, m_e= 9.1×10^{-31} Kg)

10   Commercially available H_2SO_4 contains 98% acid by mass. Find the molarity if density of   3
    the sample is 1.84g/cc. What volume of this acid is required to make 2 L of 0.1 M solution?

11   a. Explain the dual nature of electromagnetic radiation.   3
    b. Electromagnetic radiation of wavelength 242 nm is just sufficient to ionise the sodium
      atom. Calculate the energy of electromagnetic radiation in kJ/ mol.
                 (h = 6.63×10^{-34}Js)

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