DAV Public School, Thermal Colony, Panipat
Class XI Sub: Physics Assignment Unit 1 (units and measurements)

Q1: Determine the number of light year in one meter.
Q2: What is the number of electrons that would weigh 1 kg.? mass of an electron is $9.1 * 10^{-31}$ kg.
Q3: The density of a material is 0.8 g/cm^3. Express it in S.I. unit.
Q4: Express the average distance of the earth from the sun in i) light year ii) parsec.
Q5: The mass of a proton is $1.67*10^{-27}$kg. how many protons would make1 gm.
Q6: How many parsec. are there in one light year?
Q7: Find the value of 60J/min. as a system that has 100g, 100cm, and 1 min. as the base units.
Q8: $\sigma= 5.67*10^{-5}$erg $s^{-1}cm^{-2}k^{-4.}$ Convert into SI units.
Q9: A calorie is a unit of heat energy and is equals about 4.2J, where 1J = 1kgm^{2}sec^{-2}. Suppose we employ a system of units in which the unit of mass equals α kg, the unit of length is β m, the unit of time is γ sec. Show that a calorie has a magnitude $4.2\alpha^{-1}\beta^{-2}\gamma^2$ in terms of the new units.
Q10: Derive an expression for the time period T of a simple pendulum, assuming that it may depend upon (1) mass m of the bob (ii) length l of the pendulum (iii) acceleration due to gravity g at the place (iv) angular amplitude θ.
Q11: The frequency ν of vibration of a stretched string depends upon :

a) Its length l,
b) Its mass per unit length m and
c) The tension T in the string

Obtain dimensionally an expression for frequency ν.
Q12: 5.74 g of a substance occupies 1.2 cm$^{3.}$ Express its density keeping significant figure in view.
Q13: If g is the acceleration due to gravity and λ is wavelength, then which physical quantity does $\sqrt{\lambda g}$ represent?
Q14: The displacement of a progressive wave is represented by y = A sin (wt – kx), where x is distance and t is time. Write the dimensional formula of i) w and ii) k.
Q15: The Vander wall's equation for a gas is

$$\left(P + \frac{a}{V^2}\right)(V - b) = RT$$

Determine the dimension of a and b. hence write the SI units of a and b.