



Class XI – Physics (Units and Measurements)

1. If $x = at + bt^2$ where x is in meters and t is in seconds. What are the units of a and b ?
2. Fill in the blanks:
 - I. $3.0 \text{ m/s}^2 = \underline{\hspace{2cm}} \text{ km/hr}^2$
 - II. $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2 = \underline{\hspace{2cm}} \text{ g}^{-1}\text{cm}^3\text{s}^{-2}$
3. Write S.I unit of luminous intensity and temperature?
4. Calculate the time taken by the light to pass through a nucleus of diameter $1.56 \times 10^{-16} \text{ m}$. (speed of light is $3 \times 10^8 \text{ m/s}$)
5. If force (F), acceleration (A) and time (T) are taken as fundamental units, then find the dimension of energy.
6. Two resistance $R_1 = 100 \pm 3\Omega$ and $R_2 = 200 \pm 4\Omega$ are connected in series. Then what is the equivalent resistance?
7. If velocity, time and force were chosen the basic quantities, find the dimensions of mass?
8. Young's modulus of steel is $19 \times 10^{10} \text{ N/m}^2$. Express it in dynes cm^2 . Here dynes are the C.G.S unit of force.
9. The velocity v of water waves may depend on their wavelength λ density of water ρ and the acceleration due to gravity g . Find relation between these quantities by the method of dimension?
10. The force acting on an object of mass m travelling at velocity v in a circle of radius r is giving by $F = (mv^2)/r$
 The measurements recorded as $m = 3.5\text{kg} \pm 0.1\text{kg}$
 $v = 20\text{m/s} \pm 1\text{m/s}$ $r = 12.5\text{m} \pm 0.5\text{m}$
 Find the maximum possible (1) fractional error (2) % error in the measurement of force. How will you record the reading?