St. Lawrence High School
A Jesuit Christian Minority Institution

Term : 1ˢᵗ

Solution of Work Sheet – 1

Class – XI   Subject – Physics   Date – 15.06.20

Chapter – Units, Dimension & Error Analysis   Topic – Units & Dimension

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Choose the correct option for the following questions. $1 \times 15 = 15$

1. The physical quantity which is not dimensionless is –
   a. Refractive index of a medium
   b. Frequency
   c. Relative density
   d. Angle
   Ans: b. Frequency

2. The dimension of pressure is –
   a. $ML^{-2}T^{-2}$
   b. $M^{-1}L^{-1}$
   c. MLT^{-2}
   d. $ML^{-1}T^{-2}$
   Ans: d. $ML^{-1}T^{-2}$

3. The dimension of Young's modulus is equal to the dimension of –
   a. Force
   b. Momentum
   c. Pressure
   d. Energy
   Ans: c. Pressure

4. The dimension of acceleration due to gravity is –
   a. LT^{2}
   b. LT
   c. LT^{-1}
   d. LT^{-2}
   Ans: d. LT^{-2}

5. Dimension of work done or energy is –
   a. MLT^{-2}
   b. $ML^{2}T^{2}$
   c. $ML^{2}T^{-2}$
   d. MLT
   Ans: c. $ML^{2}T^{-2}$

6. The work done by electric current is $W = i^{2}Rt$, where $i = electric\ current, R = resistance\ and\ t = time$. Then the dimension of R will be –
   a. $ML^{2}T^{-3}I^{-2}$
   b. $ML^{2}T^{3}I^{-2}$
   c. $ML^{2}T^{-2}I^{-2}$
   d. $ML^{2}T^{-3}$
   Ans: a. $ML^{2}T^{-3}I^{-2}$

7. The force F on a sphere of radius r moving in a medium with velocity v is given by $F = 6\pi r \eta v$. The dimension of η is –
   a. ML^{-3}
   b. MLT^{-2}
   c. MT^{-1}
   d. $ML^{-1}T^{-1}$
      Ans: $ML^{-1}T^{-1}$

8. The dimensional formula of gravitational constant is –
   a. $M^{-1}L^3T^{-2}$
   b. $ML^{-1}T^{-1}$
   c. ML^2T^{-3}
   d. ML^2T^2
      Ans: a. $M^{-1}L^3T^{-2}$

9. The displacement of a particle y is given by the equation $y = a\, Sin\, w\left(\frac{x}{v} - k\right)$, where x is measured in cm and v is the linear velocity. The dimension of k will be –
   a. T
   b. T^{-1}
   c. MT^{-1}
   d. L^2T^{-1}
      Ans: a. T

10. A force is given by $F = at + bt^2$. Where t is time. Then the dimensions of a and b will be –
    a. ML^2T^{-3}, ML^2T^2
    b. ML^2T^2 , L^2T^{-1}
    c. MLT^{-2}, MT^{-1}
    d. MLT^{-3}, MLT^{-4}
       Ans: d. MLT^{-3}, MLT^{-4}

11. According to Plank's quantum theory, the energy of a photon is $E = h\gamma$. Where, γ is the frequency of the photon. Then what will be the dimension of h?
    a. MLT^{-1}
    b. MT^{-1}
    c. MLT
    d. ML^2T^{-3}
       Ans: a. MLT^{-1}

12. If the energy(E), velocity (v) and force (F) are taken as fundamental quantities, then the dimension of mass will be –
    a. Fv^{-2}
    b. Fv^{-1}
    c. Ev^{-2}
    d. Ev^2
       Ans: c. Ev^{-2}

13. The dimension of $\frac{a}{b}$ in the equation $P = \frac{a-t^2}{bx}$, where P is pressure, x is distance and t is time is –
    a. MLT^{-1}
    b. MT^{-2}
    c. MT^{-1}
    d. $ML^{-1}T^{-1}$
       Ans: b. MT^{-2}

14. The velocity of a particle at time t is given as $v = at + \dfrac{b}{t+c}$. Where $a, b\ and\ c$ are constants. The dimension of $a, b\ and\ c$ are respectively –

    a. LT^{-2} , $L\ and\ T$

    b. LT^{2}, LT^{-2} , T

    c. LT^{-2} , $L^{2}\ and\ T$

    d. LT^{-2} , $L\ and\ L^{-1}T$

    Ans: LT^{-2} , $L\ and\ T$

15. In the expression $10^{\frac{ax-bx^2}{t}}$, x represents distance and t represents time. Then the dimension of $a\ and\ b$ will be –

    a. $L^{-1}T$, $L^{-2}T$

    b. $L^{-2}T$, $L^{-1}T$

    c. $L^{2}T$, $L^{\frac{1}{2}}T$

    d. LT^{-1} , LT^{-2}

    Ans: a. $L^{-1}T$, $L^{-2}T$

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