DPP
DAILY PRACTICE PROBLEMS

CLASS : XIᴛʜ   SUBJECT : PHYSICS
DATE :   DPP NO. : 4

Topic :- UNITS AND MEASUREMENTS

1. Dimensional formula for force is
   a) $[ML^2T^{-2}]$ b) $[MLT^{-2}]$ c) $[ML^{-1}T^{-2}]$ d) $[ML^2T^{-2}]$

2. $[ML^{-2}T^{-2}]$ represents dimensional formula of which of the following physical quantities?
   a) Energy   b) pressure   c) Torque   d) Pressure gradient

3. The velocity of water waves v may depend upon their wavelength λ, the density of water ρ and the acceleration due to gravity g. The method of dimensions gives the relation between these quantities as
   a) $v^2 \propto \lambda g^{-1}\rho^{-1}$ b) $v^2 \propto g\lambda\rho$ c) $v^2 \propto g\lambda$ d) $v^2 \propto g^{-1}\lambda^{-3}$

4. A gas bubble from an explosion under water oscillates with a time period T, depends upon static pressure p, density of water ρ and the total energy of explosion E. Find the expression for the time period T.(where, k is a dimensionless constant)
   a) $T = kp^{-5/6}\rho^{1/2}E^{1/3}$ b) $T = kp^{-4/7}\rho^{1/2}E^{1/3}$ c) $T = kp^{-5/6}\rho^{1/2}E^{1/2}$ d) $T = kp^{-4/7}\rho^{1/3}E^{1/2}$

5. The period of oscillation of a simple pendulum in the experiment is recorded as 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s respectively. The average absolute error is
   a) 0.1 s   b) 0.11 s   c) 0.01 s   d) 1.0 s

6. In an experiment, the following observation's were recorded: $L = 2.820\ m$, $M = 3.00$ kg, $l = 0.087\ cm$, diameter $D = 0.041\ cm$. Taking $g = 9.81\ m/s^2$ using the formula,
   $Y = \frac{4MgL}{\pi D^2 l}$, the maximum permissible error in Y is
   a) 7.96%   b) 4.56%   c) 6.50%   d) 8.42%

7. *Joule-second* is the unit of
   a) Work   b) Momentum   c) Pressure   d) Angular momentum

8. If C and L denote capacitance and inductance respectively, then the dimensions of LC are
   a) $M^0L^0T^0$ b) $M^0L^0\ T^2$ c) $M^2L^0T^2$ d) MLT^2

9. The dimensional formula of the ratio of angular to linear momentum is
   a) $[M^0LT^0]$ b) $[MLT]$ c) $[ML^2T^{-1}]$ d) $[M^{-1}L^{-1}T^{-1}]$

10. The dimensions of $e^2/4\pi\varepsilon_0 hc$, where e, ε_0, h and c are electronic charge, electric permittivity, Planck's constant and velocity of light in vacuum respectively
    a) $[M^0L^0T^0]$ b) $[M^1L^0T^0]$ c) $[M^0L^1T^0]$ d) $[M^0L^0T^1]$

11. Which one of the following is not a unit of young's modulus
    a) Nm^{-1} b) Nm^{-2} c) $Dyne\ cm^{-2}$ d) Mega Pascal

12. The length, breadth and thickness of a metal block is given by $l = 90$ cm, $b = 8$ cm, $t = 2.45$ cm. The volume of the block is
    a) $2 \times 10^2 cm^3$ b) $1.8 \times 10^2 cm^3$ c) $1.77 \times 10^2 cm^3$ d) $1.764 \times 10^2 cm^3$

13. The velocity of a freely falling body changes as $g^p h^q$ where g is acceleration due to gravity and h is the height. The values of p and q are
    a) $1, \frac{1}{2}$ b) $\frac{1}{2}, \frac{1}{2}$ c) $\frac{1}{2}, 1$ d) $1, 1$

14. Which physical quantities have same dimensions
    a) Force and power b) Torque and energy c) Torque and power d) Force and torque

15. Electron $volt$ is a unit of
    a) Charge b) Potential difference c) Momentum d) Energy

16. Position of a body with acceleration a is given by $x = ka^m t^n$. Here t is time. Find the dimensions of m and n.
    a) $m = 1, n = 1$ b) $m = 1, n = 2$ c) $m = 2, n = 1$ d) $m = 2, n = 2$

17. The dimensions of universal gas constant is
    a) $[ML^2T^{-2}\theta^{-1}]$ b) $[M^2LT^{-2}\theta]$ c) $[ML^3T^{-1}\theta^{-1}]$ d) None of these

18. Which of the following is the unit of specific heat?
    a) Jkg °C^{-1} b) Jkg^{-1} °C^{-1} c) kg °CJ^{-1} d) J/kg^{-1} °C^{-2}

19. The dimensions of inter atomic force constant are
    a) MT^{-2} b) MLT^{-1} c) MLT^{-2} d) $ML^{-1}T^{-1}$

20. Which physical quantities have the same dimension
    a) Couple of force and work b) Force and power
    c) Latent heat and specific heat d) Work and power