1. The dimensions of Reynold's constant are
   a) $[M^0L^0T^0]$ b) $[ML^{-1}T^{-1}]$ c) $[ML^{-1}T^{-2}]$ d) $[ML^{-2}T^{-2}]$

2. Volt is equivalent to
   a) $\dfrac{erg}{centimetre}$ b) $\dfrac{newton}{coulomb}$ c) $\dfrac{jouls}{coulomb}$ d) $\dfrac{erg}{ampere}$

3. Identify the pair whose dimensions are equal
   a) Torque and work b) Stress and energy c) Force and stress
   d) Force and work

4. Which one of the following represents the correct dimensions of the coefficient of viscosity?
   a) $[ML^{-1}T^{-1}]$ b) $[MLT^{-1}]$ c) $[ML^{-1}T^{-2}]$ d) $[ML^{-2}T^{-2}]$

5. Out of the following pair, which one does NOT have identical dimensions?
   a) Impulse and momentum
   b) Angular momentum and Planck's constant
   c) Work and torque
   d) Moment of inertia and moment of a force (towards north-west)

6. The dimensions of magnetic Field in M, L, T and C (coulomb) is given as
   a) $[MLT^{-1}C^{-1}]$ b) $[MT^2C^{-2}]$ c) $[MT^{-1}C^{-1}]$ d) $[MT^{-2}C^{-1}]$

7. If area (A), velocity (V) and density (ρ) are base units, then the dimensional formula of force can be represented as
   a) $Av\rho$ b) $Av^2\rho$ c) $Av\rho^2$ d) $A^2v\rho$

8. The surface tension of a liquid is 70 dyne/cm. In MKS system its value is
   a) 70 N/m b) 7×10^{-2} N/m   c) 7×10^3 N/m   d) 7×10^2 N/m

9. If C and R represent capacitance and resistance respectively, then the dimensions of RC are
   a) $[M^0L^0T^2]$ b) $[M^0L^0T]$ c) $[ML^{-2}]$ d) None of these

10. E, m, J and G denote energy, mass, angular momentum and gravitational constant respectively, then the dimensions of $\dfrac{EJ^2}{m^5G^2}$ is
    a) Angle   b) Length c) Mass   d) Time

11. The equation of state of some gases can be expressed as $\left(P + \dfrac{a}{V^2} \right)$ $(V - b) = RT$. Here P is the pressure, V is the volume a, b, R are constants. The dimensions of 'a' are.
    a) $[ML^5T^{-2}]$ b) $[ML^{-1}T^{-2}]$ c) $[M^0L^3T^0]$ d) $[M^0L^6T^0]$

12. The frequency of vibration f of a mass m suspended from a spring of spring constant K is given by a relation of this type f $= C\, m^xK^y$; where C is a dimensionless quantity. The value of x and y are
    a) $x = \frac{1}{2}, y = \frac{1}{2}$ b) $x = -\frac{1}{2}, y = -\frac{1}{2}$ c) $x = \frac{1}{2}, y = -\frac{1}{2}$ d) $x = -\frac{1}{2}, y = \frac{1}{2}$

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13. The period of a body under SHM is represented by $T = P^a D^b S^c$; where P is pressure, D is density and S is surface tension. The value of a, b and c are

a) $-\frac{3}{2}, \frac{1}{2}, 1$ b) $-1, -2, 3$ c) $\frac{1}{2}, -\frac{3}{2}, -\frac{1}{2}$ d) $1, 2, \frac{1}{3}$

14. The dimensions of physical quantity X in the equation Force = $\frac{X}{\text{Density}}$ is given by

a) $[M^1 L^4 T^{-2}]$ b) $[M^2 L^{-2} T^{-1}]$ c) $[M^2 L^{-2} T^{-2}]$ d) $[M^1 L^{-2} T^{-1}]$

15. Each side of a cube is measured be 7.203 m. What is the total volume of the cube to appropriate significant figures –
a) 373.7 m³ b) 311.3 m³ c) 211.3 m³ d) 3737 m³

16. Find the value of $\frac{1.53 \times 0.9995}{1.592}$ with due regard for significant figures
a) 0.961 b) 0.123 c) 0.921 d) 0.913

17. The values of kinetic energy K and potential energy U are measured as follows :
K = 100.0 $\pm$ 2.0 J, U = 200.0 $\pm$ 1.0 J. Then the percentage error in the measurement of mechanical energy is
a) 2.5% b) 1% c) 0.5% d) 1.5%

18. The initial and final temperatures of a liquid in a container are observed to be 76.3 $\pm$ 0.4°C and 67.7 $\pm$ 0.3°C. Find the fall in the temperature of the liquid.
a) 8.6 $\pm$ 0.1°C b) 8.6 $\pm$ 0.7°C c) 1.6 $\pm$ 0.1°C d) 8.6 $\pm$ 1.1°C

19. The density of a sphere is measured by measuring its mass and diameter. If it is known that the maximum percentage errors in the measurement of mass and diameter are 2% and 3%, then find the maximum percentage error in the measurement of density?
a) 15% b) 18% c) 9% d) 11%

20. With the usual notations, the following equation

$S_t = u + \frac{1}{2} a (2t - 1)$ is

a) Only numerically correct
b) Only dimensionally correct
c) Both numerically and dimensionally correct
d) Neither numerically nor dimensionally correct

21. An athletic coach told his team that muscle times speed equals power. What dimensions docs he view for muscle?
a) $[MLT^{-2}]$ b) $[ML^2 T^{-2}]$ c) $[MLT^2]$ d) $[L]$

22. If P represents radiation pressure, c represents speed of light and Q represents radiation energy striking a unit area per second, the non-zero integers x, y and z such that $P^x Q^y c^z$ is dimensionless, are.
a) x = 1, y = 1, z = –1 b) x = 1, y = –1, z = 1

c) X = –1, y = 1, z = 1   d) x = 1, y = 1, z = 1

23. The unit of modulus of rigidity are is
    a) N – m   b) N/m   c) N – m^2 d) N/m^2

24. If x = at + bt^2, where x is the distance travelled by the body in kilometers while t is the time in seconds, then the unit of b is
    a) km/s   b) km-s   c) km/s^2 d) km-s^2

25. In the relation, $\frac{dy}{dx}$ = 2ω sin (ωt + φ$_0$), the dimensional formula for (ωt + φ$_0$) is
    a) [MLT]   b) [MLT^0]   c) [ML^{0}T^0]   d) [M^{0}L^{0}T^0]