1. 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^{-1} (d) None of the above

2. The velocity of a freely falling body changes as g^ph^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) $1, 1$

3. The dimensions of CV^2 matches with the dimensions of

(a) L^2I (b) L^2I^2

(c) LI^2 (d) $\frac{1}{LI}$

4. The foundations of dimensional analysis were laid down by

(a) Gallileo (b) Newton

(c) Fourier (d) Joule

5. Dimensions of time in power are

(a) T^{-1} (b) T^{-2}

(c) T^{-3} (d) T^0

6. The dimension of the ratio of angular to linear momentum is

(a) $M^0L^1T^0$ (b) $M^1L^1T^{-1}$

(c) $M^1L^2T^{-1}$ (d) $M^{-1}L^{-1}T^{-1}$

7. Let $[\varepsilon_0]$ denotes the dimensional formula of the permittivity of the vacuum and $[\mu_0]$ that of the permeability of the vacuum. If $M = \text{mass}$, $L = \text{length}$, $T = \text{Time}$ and $I = \text{electric current}$, then

(a) $[\varepsilon_0] = M^{-1}L^{-3}T^2I$ (b) $[\varepsilon_0] = M^{-1}L^{-3}T^4I^2$

(c) $[\mu_0] = MLT^{-2}I^{-2}$ (d) $[\mu_0] = ML^2T^{-1}I$

8. Given that v is speed, r is the radius and g is the acceleration due to gravity. Which of the following is dimensionless

(a) v^2/rg (b) v^2r/g

(c) v^2g/r (d) v^2rg

9. The physical quantity which has the dimensional formula M^1T^{-3} is

(a) Surface tension (b) Solar constant

(c) Density (d) Compressibility

10. If the time period (T) of vibration of a liquid drop depends on surface tension (S), radius (r) of the drop and density (ρ) of the liquid, then the expression of T is

(a) $T = k\sqrt{\rho r^3/S}$ (b) $T = k\sqrt{\rho^{1/2}r^3/S}$

(c) $T = k\sqrt{\rho r^3/S^{1/2}}$ (d) None of these

11. $ML^3T^{-1}Q^{-2}$ is dimension of

(a) Resistivity (b) Conductivity

(c) Resistance (d) None of these

12. The fundamental physical quantities that have same dimensions in the dimensional formulae of torque and angular momentum are

(a) Mass, time (b) Time, length

(c) Mass, length (d) Time, mole

13. Dimensions of luminous flux are

(a) ML^2T^{-2} (b) ML^2T^{-3}

(c) ML^2T^{-1} (d) MLT^{-2}

14. Identify the pair which has different dimensions

(a) Planck's constant and angular momentum

(b) Impulse and linear momentum

(c) Angular momentum and frequency

(d) Pressure and Young's modulus

15. Identify the pair whose dimensions are equal

(a) Torque and work (b) Stress and energy

(c) Force and stress (d) Force and work

16. An object is moving through the liquid. The viscous damping force acting on it is proportional to the velocity. Then dimension of constant of proportionality is

(a) $ML^{-1}T^{-1}$ (b) MLT^{-1}

(c) M^0LT^{-1} (d) ML^0T^{-1}

17. Dimension of R is

(a) ML^2T^{-1} (b) $ML^2T^{-3}A^{-2}$

(c) $ML^{-1}T^{-2}$ (d) None of these

18. Frequency is the function of density (ρ), length (a) and surface tension (T). Then its value is

(a) $k\rho^{1/2}a^{3/2}/\sqrt{T}$ (b) $k\rho^{3/2}a^{3/2}/\sqrt{T}$

(c) $k\rho^{1/2}a^{3/2}/T^{3/4}$ (d) $k\rho^{1/2}a^{1/2}/T^{3/2}$

19. The dimension of $\frac{R}{L}$ are

(a) T^2 (b) T

(c) T^{-1} (d) T^{-2}

20. The dimensions of shear modulus are

(a) MLT^{-1} (b) ML^2T^{-2}

(c) $ML^{-1}T^{-2}$ (d) MLT^{-2}