1. A planet is at a distance of 8.427×10^8 km from earth. Its angular diameter is 35.72" of an arc. Calculate the diameter of the planet.
   a) 1.426×10^5 km b) 2.426×10^5 km c) 1.526×10^5 km d) 1.726×10^5 km
2. A stone weighs (10.0 $\pm$ 0.1) kg in air. The weight of the stone in water is (5.0 $\pm$ 0.1) kg. Find the maximum percentage error in the measurement of specific gravity.
   a) 2% b) 3% c) 5% d) 8%
3. Two resistances are expressed as $R_1 = (4 \pm 0.5)$ and $R_2 = (12 \pm 0.5)$ Ω. What is the net resistance when they are connected (i) in series and (ii) in parallel, with percentage error?
   a) $16\Omega \pm 23\%$, $3\Omega \pm 6.25\%$ b) $3\Omega \pm 2.3\%$, $3\Omega \pm 6.25\%$
   c) $3\Omega \pm 23\%$, $16\Omega \pm 6.25\%$ d) $16\Omega \pm 6.25\%$, $3\Omega \pm 23\%$
4. A gas bubble from an explosion under water, oscillates with a period T proportional to $p^a d^b E^c$ where p is the static pressure, d is the density of water and E is the total energy of explosion. Find the value of a, b and c.
   a) $a = -\frac{5}{6}$, $b = \frac{1}{2}$, $c = \frac{2}{3}$ b) $a = \frac{2}{3}$, $b = \frac{1}{2}$, $c = \frac{1}{3}$
   a) $a = -\frac{5}{6}$, $b = \frac{2}{3}$, $c = \frac{1}{3}$ b) $a = -\frac{5}{6}$, $b = \frac{1}{2}$, $c = \frac{1}{3}$
5. The percentage errors in the measurement of mass and speed are 2% and 3% respectively. The error in kinetic energy obtained by measuring mass and speed will be
   a) 12% b) 10% c) 8% d) 2%
6. A suitable unit for gravitational constant is –
   a) kg-m sec^{-1} b) Nm^{-1} sec c) Nm2 kg^{-2}
   d) None of these
7. The unit of Stefan's constant σ is –
   a) $Wm^{-2} K^{-1}$ b) $Wm^{-2} K^3$ c) $Wm^{-2} K^{-4}$ d) $Wm^{-2} K^4$
8. In S = a + bt + ct2. S is measured in metres and t in seconds. The unit of c is –
   a) None b) m c) ms^{-1} d) ms^{-2}
9. The unit of surface tension in SI system is
   a) Dyne/cm^2 b) Newton/m c) Dyne/cm d) Newton/m^2
10. The velocity of a particle depends upon as $v = a + bt + ct^2$; if the velocity is in m/sec, the unit of a will be
    a) m/sec b) m/sec^2 c) m^2/sec d) m/sec^3
11. Curie is a unit of –
    a) Energy of γ-rays b) Half life c) Radioactivity
    d) Intensity of γ-rays
12. The equation $\left(P + \frac{a}{V^2}\right)$ (V – b) const. The units of a arc

a) Dyne x cm^5 b) Dyne x cm^4 c) Dyne x cm^3
d) Dyne x cm^2

13. unit of impulse is –
a) Newton b) kg-m c) kg-m/s d) Joule

14. Which of the following is not a unit of time –
a) Leap year b) Micro second c) Lunar month d) Light year

15. In C.G.S. system the magnitude of the force is 100 dynes. In another system where the fundamental physical quantities are kilogram, metre and minute, the magnitude of the force is –
a) 0.036 b) 0.36 c) 3.6 d) 36

16. The unit of L/R is (where L = inductance & R = resistance)
a) sec b) sec^{-1} c) Volt d) Ampere

17. Which is different from others by units
a) Phase difference b) Mechanical equivalent
c) Loudness of sound d) Poisson's ratio

18. The dimensional formula for the modulus of rigidity is –
a) ML^2T^{-2} b) $ML^{-1}T^{-3}$ c) $ML^{-2}T^{-2}$ d) $ML^{-1}T^{-2}$

19. Out of the following, the only pair that does not have identical dimensions is –
a) Angular momentum and Planck's constant b) Moment of inertia and moment of a force
c) Work and torque d) Impulse and momentum

20. 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 $f = Cm^xK^y$; 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) $x = -\frac{1}{2}, y = \frac{1}{2}$

21. 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) $v^2 \propto g^{-1} \lambda^{-3}$

22. The equation of a wave is given by
$Y = A \sin \omega \left(\frac{x}{v} - k\right)$, where ω is the angular velocity and v is the linear velocity. The dimensions of k is –
a) LT b) T c) T^{-1} d) T^2

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

24. The period of a body under SHM i.e. presented by $T = P^aD^bS^c$; 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) $1, 2, \frac{1}{3}$

25. 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, 1/2 b) 1/2, 1/2 c) 1/2, 1 d) 1, 2