DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH   SUBJECT : PHYSICS
DATE :   DPP NO. : 1

Topic :- UNITS AND MEASUREMENTS

1. In an experiment,   to measure the height of
   a bridge by dropping stone into water underneath, if the error in measurement of time is $0.1 s$ at the end of
   $2s$, then the error in estimation of height of bridge will be
   a) $0.49\ m$ b) $0.98\ m$ c) $1.96\ m$ d) $2.12\ m$

2. The dimension of k in the equation $W = \frac{1}{2}kx^2$ is
   a) $[ML^0T^{-2}]$ b) $[M^0LT^{-1}]$ c) $[MLT^{-2}]$ d) $[ML^0T^{-1}]$

3. A body of mass $m = 3.513$ kg is moving along the $x-$axis with a speed of $5.00\ \mathrm{ms}^{-1}$. The magnitude of its
   momentum is recorded as
   a) $17.6\ \mathrm{kg\ ms}^{-1}$ b) $17.565\ \mathrm{kg\ ms}^{-1}$ c) $17.56\ \mathrm{kg\ ms}^{-1}$ d) $17.57\ \mathrm{kg\ ms}^{-1}$

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

5. The unit of physical quantity obtained by the line intergral of electric field is
   a) NC^{-1} b) Vm^{-1} c) JC^{-1} d) $C^2N^{-1}m^{-2}$

6. The dimensions of gravitational constant G and the moment of inertia are respectively
   a) $[ML^3T^{-2}]; [ML^2T^0]$ b) $[M^{-1}L^3T^{-2}]; [ML^2T^0]$
   c) $[M^{-1}L^3T^{-2}]; [M^{-1}L^2T]$ d) $[ML^3T^{-2}]; [M^{-1}L^2T]$

7. Unit of stress is
   a) N/mb) $N-m$c) N/m^2 d) $N-m^2$

8. Crane is British unit of volume (one crane = 170.4742). convert crane into SI units.
   a) $0.170474\ \mathrm{m}^3$ b) $17.0474\mathrm{m}^3$ c) $0.00170474\mathrm{m}^3$ d) $1704.74\mathrm{m}^3$

9. SI unit of intensity of wave is
   a) $\mathrm{Jm}^{-2}s^{-1}$ b) $\mathrm{Jm}^{-1}s^{-2}$ c) $\mathrm{W\ m}^{-2}$ d) $\mathrm{J\ m}^{-2}$

10. If F denotes force and t time, then in equation $F = at^{-1} + bt^2$, the dimensions of a and b respectively are
    a) $[LT^{-4}]$ and $[LT^{-1}]$ b) $[LT^{-1}]$ and $[LT^{-4}]$
    c) $[MLT^{-4}]$ and $[MLT^{-1}]$ d) $[MLT^{-1}]$ and $[MLT^{-4}]$

11. If the constant of gravitation (G), Plank's constant (h) and the velocity of light (c) be chosen as
    fundamental units. The dimension of the radius of gyration is
    a) $h^{1/2}c^{-3/2}G^{1/2}$ b) $h^{1/2}c^{3/2}G^{1/2}$ c) $h^{1/2}c^{-3/2}G^{-1/2}$ d) $h^{-1/2}c^{-3/2}G^{1/2}$

12. The mass and volume of a body are found to be $500 \pm 0.05\ kg$ and $1.00 \pm 0.05 m^3$ respectively. Then the

maximum possible percentage error in its density is
a) 6%　　　　　　　　　b) 3%　　　　　　　　　c) 10%　　　　　　　　　d) 5%

13. The unit of Stefan's constant σ is
a) $W\ m^{-2}\ K^{-1}$　　　　b) $W\ m^2\ K^{-4}$　　　　c) $W\ m^{-2}\ K^{-4}$　　　　d) $W\ m^{-2}\ K^4$

14. In the equation $y = a \sin(\omega t + kx,)$ the dimensional formula of ω is
a) $[M^0L^0T^{-1}]$　　　　b) $[M^0LT^{-1}]$　　　　c) $[ML^0T^0]$　　　　d) $[M^0L^{-1}T^0]$

15. The following observations were take for determining surface tension of water by capillary tube method.
Diameter of capillary, $D = 1.25 \times 10^{-2}$ m and rise of water in capillary. $h = 1.46 \times 10^{-2}$m
Taking g $= 9.80\text{ms}^{-2}$ and using the relation $T = (rgh/2) \times 103\text{Nm}^{-1}$, what is the possible error in surface tension$T$?
a) 2.4%　　　　　　　　　b) 15%　　　　　　　　　c) 1.6%　　　　　　　　　d) 0.15%

16. R and L represent respectively resistance and self inductance, which of the following combinations has the dimensions of frequency
a) $\frac{R}{L}$　　　　　　　b) $\frac{L}{R}$　　　　　　　c) $\sqrt{\frac{R}{L}}$　　　　　　　d) $\sqrt{\frac{L}{R}}$

17. The random error in the arithmetic mean of 100 observations is x; then random error in the arithmetic mean of 4000 observations would be
a) $4x$　　　　　　　b) $\frac{1}{4}x$　　　　　　　c) $2x$　　　　　　　d) $\frac{1}{2}x$

18. Which of the following is dimensionally correct
a) Pressure = Energy per unit area
b) Pressure = Energy per unit volume
c) Pressure = Force per unit volume
d) Pressure = Momentum per unit volume per unit time

19. R, L and C represent the physical quantities resistance, inductance and capacitance respectively. Which one of the following combination has dimension of frequency?
a) $\frac{1}{\sqrt{RC}}$　　　　　b) $\frac{R}{L}$　　　　　c) $\frac{1}{LC}$　　　　　d) $\frac{C}{L}$

20. If the length of a rectangle $l = 10.5$ cm, breadth $b = 2.1$ cm and minimum possible measurement by scale = 0.1 cm, then the area is
a) 22.0 cm^2　　　　b) 22.1 cm^2　　　　c) 22.05 cm^2　　　　d) 22 cm^2