

CLASS : XITH DATE : SUBJECT : PHYSICS 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 0.1s 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) $[ML^{0}T^{-2}]$ b) $[M^0LT^{-1}]$ d) $[ML^0T^{-1}]$ c) $[MLT^{-2}]$ 3. A body of mass m = 3.513 kg is moving along the x - axis with a speed of 5.00 ms⁻¹. The magnitude of its momentum is recorded as c) 17.56 kg ms⁻¹ a) 17.6 kg ms⁻¹ b) 17.565 kg ms⁻¹ d) 17.57 kg ms⁻¹ 4. The dimensional formula for the modulus of rigidity is d) $ML^{-1}T^{-2}$ a) ML^2T^{-2} b) $ML^{-1}T^{-3}$ c) $ML^{-2}T^{-2}$ 5. The unit of physical quantity obtained by the line intergral of electric field is d) $C^2 N^{-1} m^{-2}$ a) NC⁻¹ c) IC⁻¹ b) Vm^{-1} 6. The dimensions of gravitational constant *G* and the moment of inertia are respectively a) $[ML^{3}T^{-2}]; [ML^{2}T^{0}]$ b) $[M^{-1}L^{3}T^{-2}]; [ML^{2}T^{0}]$ c) $[M^{-1}L^{3}T^{-2}]; [M^{-1}L^{2}T]$ $[ML^{3}T^{-2}];[M^{-1}L^{2}T]$ d) 7. Unit of stress is d) N - m^2 *N*-*m* c) N/m^2 a) N/m b) 8. Crane is British unit of volume (one crane = 170.4742). convert crane into SI units. a) 0.170474 m³ b) $17.0474m^3$ c) 0.00170474m³ d) 1704.74m³ 9. SI unit of intensity of wave is b) $Im^{-1}s^{-2}$ a) $Im^{-2}s^{-1}$ c) W m⁻² d) $I m^{-2}$

| 10. | If <i>F</i> denotes force and <i>t</i> time, then in equation $F = at^{-1} + bt^2$, the dimensions of <i>a</i> and <i>b</i> | | |
|-----|--|----|--|
| | 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 $1.00 \pm 0.05m^3$ 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 isa) $W m^{-2} K^{-1}$ 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 = 9.80ms⁻² and using the relation $T = (rgh/2) \times 103$ 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) $\frac{L}{L}$ |
|--------------------------|------------------|-------------------|------------------|
| | | | |

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 cm² b) 22.1 cm² c) 22.05 cm² d) 22 cm²

