

DPP

DAILY PRACTICE PROBLEMS

CLASS : XITH
DATE :

SUBJECT : PHYSICS
DPP NO. : 3

Topic :- UNITS AND MEASUREMENTS

- The dimensions of $\frac{a - t^2}{bx}$ where p is pressure, x is distance and t is time, are $\frac{a}{b}$ in the equation $p =$
 - $[M^2LT^{-3}]$
 - $[MT^{-2}]$
 - $[LT^{-3}]$
 - $[ML^3T^{-1}]$
- The focal length of a mirror is given by $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ where u and v represent object and image distances respectively. The maximum relative error in f is
 - $\frac{\Delta f}{f} = \frac{\Delta u}{u} + \frac{\Delta v}{v}$
 - $\frac{\Delta f}{f} = \frac{1}{\Delta u/u} + \frac{1}{\Delta v/v}$
 - $\frac{\Delta f}{f} = \frac{\Delta u}{u} + \frac{\Delta v}{v} - \frac{\Delta(u+v)}{u+v}$
 - $\frac{\Delta f}{f} = \frac{\Delta u}{u} + \frac{\Delta v}{v} + \frac{\Delta u}{u+v} + \frac{\Delta v}{u+v}$
- Which of the following relation is wrong
 - 1 ampere \times 1 ohm = 1 volt
 - 1 watt \times 1 sec = 1 joule
 - 1 \times newton per coulomb = 1 volt per meter
 - 1 coulomb \times 1 volt = 1 watt
- The unit of self inductance of a coil is
 - Farad
 - Henry
 - Weber
 - Tesla
- Out of the following four dimensional quantities, which one qualifies to be called a dimensional constant?
 - Acceleration due to gravity
 - Surface tension of water
 - Weight of a standard kilogram mass
 - The velocity of light in vacuum
- The radius of the proton is about 10^{-15} m. The radius of the observable universe is 10^{26} m. identify the distance which is half-way between these two extremes on a logarithmic scale.
 - 10^{21} m
 - 10^6 m
 - 10^{-6} m
 - 10^0 m
- The position of a particle at time t is given by the equation $x(t) = \frac{v_0}{A} (1 - e^{-At})$, $v_0 =$ constant and $A > 0$. Dimensions of v_0 and A respectively are
 - $[M^0L^0T^0]$ and $[M^0L^0T^{-1}]$
 - $[M^0LT^{-1}]$ and $[M^0LT^{-2}]$
 - $[M^0LT^{-1}]$ and $[M^0L^0T]$
 - $[M^0LT^{-1}]$ and $[M^0L^0T^{-1}]$
- One nanometre is equal to
 - 10^9 mm
 - 10^{-6} cm
 - 10^{-7} cm
 - 10^{-9} cm
- $[ML^2T^{-3}A^{-2}]$ is the dimensional formula of
 - Electric resistance
 - Capacity
 - Electric potential
 - Specific resistance
- The dimensions of Planck's constant are
 - $[M^2L^2T^{-2}]$
 - $[MLT^{-2}]$
 - $[ML^2T^{-2}]$
 - $[ML^2T^{-1}]$
- If the length of rod A is 3.25 ± 0.01 cm and that of B is 4.19 ± 0.01 cm then the rod B is longer than rod A

by

- a) $0.94 \pm 0.00 \text{ cm}$ b) $0.94 \pm 0.01 \text{ cm}$ c) $0.94 \pm 0.02 \text{ cm}$ d) $0.94 \pm 0.005 \text{ cm}$

12. The dimensions of $e^2/4\pi\epsilon_0 hc$, where e , ϵ_0 , h and c are electronic charge, electric permittivity, Planck's constant and velocity of light in vacuum respectively, are

- a) $[M^0L^0T^0]$ b) $[ML^0T^0]$ c) $[M^0LT^0]$ d) $[M^0L^0T^1]$

13. The length, breadth and thickness of a block are given by $l = 12\text{cm}$, $b = 6 \text{ cm}$ and $t = 2.45\text{cm}$. The volume of block according to the idea of significant figures should be

- a) $1 \times 10^2 \text{ cm}^3$ b) $2 \times 10^2 \text{ cm}^3$ c) $1.763 \times 10^2 \text{ cm}^3$ d) None of these

14. A physical quantity A is related to four observables a , b , c and d as follows

$$A = \frac{a^2 b^3}{c \sqrt{d}}$$

The percentage errors of measurement in a , b , c and d are 1%, 3%, 2% and 2% respectively. What is the percentage error in the quantity A ?

- a) 12% b) 7% c) 5% d) 14%

15. Ampere-hour is the unit of

- a) Quantity of charge b) Potential c) Energy d) Current

16. The dimensions of $1/2 \epsilon E^2$ are same as

- a) Energy density (energy per unit volume) b) Energy
c) Power d) None of the above

17. The velocity of a particle (v) at an instant t is given by $v = at + bt^2$ the dimension of b is

- a) L b) LT^{-1} c) LT^{-2} d) LT^{-3}

18. Wavelength of ray of light is 0.00006 m . It is equal to

- a) 6 micron b) 60 micron c) 600 micron d) 0.6 micron

19. The unit of surface tension in SI system is

- a) Dyne/cm^2 b) Newton/m c) Dyne/cm d) Newton/m^2

20. Dimensions of $\frac{1}{\mu_0 \epsilon_0}$, where symbols have their usual meaning, are

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