Class: 9
Subject: Physics
Topic: Basic Mathematics Application
No. of Questions: 20

1. What is the difference between A^o and A.U.?

2. Define S.I. unit of solid angle?

3. Name physical quantities whose units are electron volt and Pascal?

4. When a planet X is at a distance of 824.7 million kilometers from earth its angular diameter is measured to be 35.7211^0 of arc. Calculate the diameter of 'X'.

5. A radar signal is beamed towards a planet from the earth and its echo is received seven minutes later. Calculate the velocity of the signal, if the distance between the planet and the earth is 6.3x10^{10}m?

6. Give two methods for measuring time intervals?

7. Find the dimensions of latent heat and specific heat?

8. In Vander Waal's equation $\left(P + \frac{a}{V^2} \right) (V - b)$ = RT

9. E, M , I and G denote energy, mass, angular momentum and gravitational constant respectively. Determine the dimensions of EL^2/ m^{5}G^2
    (A) E = $[ML^2T^{-2}]$
    (B) L = $[ML^2T^{-1}]$
    (C) m = [M]
    (D) G = $[M^{-1}L^3T^{-2}]$

10. (A) State which of the following are dimensionally current

    (i)   Pressure = Energy per unit volume
    (ii)   Pressure = Momentum × volume × time

    (B)The density of cylindrical rod was measured by the formula: - P = $\frac{4\,m}{\pi D^2 L}$ The percentage in m, D and L are 1% , 1.5 % and 0.5% . Calculate the % error in the calculated value of density?

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11. If $x = at + bt^2$ where x is in meters and t is in seconds. What are the units of a and b?

12. Fill ups.
    (A) $3.0\ m/s^2$ = …………………… Km / hr^2
    (B) $6.67 \times 10^{-11}\ Nm^2/ Kg^2$ = ………………………… $g^{-1}\ cm^3 s^{-2}$

13. Write S.I unit of luminous intensity and temperature?

14. Time $= \dfrac{distance}{velocity}$

15. If force (F) acceleration (A) and time (T) are taken as fundamental units, then find the dimension of energy.

16. Two resistances $R_1 = 100 \pm 3\Omega$ and $R_2 = 200 \pm 4\Omega$ are connected in series. Then what is the equivalent resistance?

17. If velocity, time and force were chosen the basic quantities, find the dimensions of mass?

18. Young's modulus of steel is $19 \times 100^{10}\ N/ m^2$.   Express it in dynes cm^2. Here dynes are the C.G.S. unit of force.

19. The velocity v of water waves may depend on their wavelength λ density of water ρ and the acceleration due to gravity g. Find relation between these quantities by the method of dimension?

20. The force acting on an object of mass m traveling at velocity v in a circle of radius r is giving by F
    $= \dfrac{mv^2}{r}$ The measurements recorded as m= 3.5 kg $\pm$ 0.5m
    Find the maximum possible (1) fractional error (2) % error in the measurement of force. How will you recorded reading?
    Solution: