ASSIGNMENT

CLASS-11

UNITS AND MEASUREMENTS

Very short answer type questions

1> Find the area of circle of radius 3.458cm up to correct significant figures.
2> Name the physical quantities whose dimensions are same.
3> State the no. of significant fig. in the following (a)0.007 cm (b)2.64 x 10^{24}kg (c)0.2370 cm
4> Which of the following measurement is more accurate and why? (1)5000.0 cm(2)0.0005cm (3) 6.00cm.
5> Are all dimensionally correct equations numerically correct? Give one example.
6> If $x=a+bt+ct^2$ where x is in meters and t is in second, what is the dimensional formula of 'a' , and 'c'.
7> Write the dimensions formula of (1) Planck's constant and(2) Rydberg's constant

Short answer type questions

1>The wavelength 'λ' depends mass M of the moving particle its velocity v and planks constant 'h' . Show dimensionally the relationship between them.

2>In an experiment the refractive index of the glass was observed to be 1.45, 1.56,1.54,1.44,1.54 and 1.53 . Calculate (1) mean value of the refractive index ;(2) Absolute error ;(3)Fractional error ; (4)Percentage error . Express the result in terms of absolute error and percentage error.

3> If $(p+ a/V^2) (V-b)=RT$ where the symbols has their usual meanings, then what is the dimension of a/b .

4. If F= a/ b+√d , where f=force ,d= density , then find the dimension of a and b.

5> The factors effecting the time period (T) of the simple pendulum depends on mass , length and acceleration due to gravity . Deduce the relation for time period of the simple pendulum.

6> To determine acceleration due to gravity ,the time of 20 oscillations of a simple pendulum of length 100 cm was observed to be 40 s . calculate the value of 'g' and maximum percentage error in the measured value of 'g' .

7> If power $P=a-x^2/b$ where x represents displacement find the dimension of a and b.
8> A physical quantity Qis given by $Q= A^2.B^{3/2}/C^4D^{1/2}$ percentage error in A,B,C,D are 1%, 2%,4%,2% respectively . Find the percentage error in Q.

9>The measured value of length , breadth and height of a block is given as l=12.08+-0.01 cm , b=10.12+-0.01cm . h=5.62+-0.01 cm . Calculate the percentage error in the volume of the block.

10>(a) convert 10 J into ergs . (b) convert 10 N into dyne .

11> A planet moves around the sun , the period of revolution 'T' depends upon radius of the orbit 'R', mass of the sun 'M' and gravitational constant 'G', show that $T^2 \alpha R^3$.

12>If the length and time period of an oscillating pendulum have errors of 1% and 2% respectively , what is the error in the estimate of 'g'.

13>The force experienced by a mass moving with a uniform speed v in a circular path of radius r experiences a force which depends upon its mass, radius and speed prove that $F= mv^2/r$.

14> Convert one atmospheric pressure in to dyne cm^{-2} .

15>If the unit of force , energy and velocity are 10N , 100J and 5m/s, find the units of length mass and time.

16>If velocity v=a +bt + (c/(d+t)) write the dimension of a,b,c and d

17>If the equation y=A sin(ωt - kx) obtain the dimension formula of ω and k , if x and y is displacement , A is amplitude and t is time.

18> Write the dimension of a/b if $F =a\sqrt{x} + bt^2$. Where F is force , x is distance and t is time.

19> The velocity v of a transverse wave of a string may depends upon length l , tension T and mass per unit length m of the string derive the formula .

20>In an experiment the value of two resistance $r_1 =5\pm0.2$ ohm and $r_2=10\pm0.1$ ohm , find the equivalent resistance (1) in series, (2) in parallel combinations with limit of % error.