ASSIGNMENT

CLASS :XII

SUBJECT:PHYSICS

ONE MARK QUESTIONS

1.Calculate the number of astronomical units in one meter.

2.State the number of significant figures in the following :

(i) 2.000m

(ii) 5100kg

(iii) 0.050 cm.

3.What is the difference between mN , Nm and nm ?

4.If slap times speed equals power, what will be the dimensional equation for 'slap'?

5.Can a quantity have dimensions but still has no units ?

6.Can a quantity have different dimensions in different system of units?

7.Can a quantity have dimensions but still has no units?

8.Is light year a unit of time ?

9. Define light year and express it in meters.

10. How many light years are there in one meter ?

11.State the principle of homogeneity of dimensions.

12.Write the names of three dimensional constants.

13.Under what condition will the distance and displacement of moving object have the same magnitude?

14.A particle is moving along a circular track of radius r. What is the distance traversed by particle in half rotation? What is its displacement?

15.The v-t graphs of two objects make angles of 30^0 and 60^0 with the time axis .Find the ratio of their accelerations.

16.If the displacement time graph for a particle is parallel to time axis, how much is the velocity of the particle?

17.What does the area under velocity –time graph represent ?

18.What does the area under acceleration-time graph represent?

TWO OR THREE MARKS QUESTIONS

19.Show that the slope of displacement –time graph is equal to the velocity of uniform motion.

20.Draw the following graphs between distance and time of an object in case of

(i) for a body at rest

(ii) for a body moving with constant acceleration.

21.Draw the following graphs representing motion of an object under free fall.

(i) Variation of position with respect to time

(ii) Variation of velocity with respect to time.

(iii) Variation of acceleration with respect to time.

22. Name the physical quantities whose dimensional formulae are as follows:

(i) ML^2T^{-2}

(ii) ML^2T^{-3}

(iii) $ML^{-1}T^{-1}$

23.Deduce the dimensional formulae for the following physical quantites:

(i) Gravitational Constant

(ii) Power Young's modulus

(iii) Coefficient of viscosity.

(iv) Planck's Constant

24.If the velocity of light c , acceleration due to gravity g and atmospheric pressure p are the fundamental quantities , find the dimensions of length.

25.Taking velocity , time and force as the fundamental quantities , find the dimensions of mass.

26**.** An object is in uniform motion along a straight line. What will be position –time graph for the motion of the object if

(a) X_o = +ve , v= +ve

(b) X_0 =+ve , v= -ve.

(c) X_0 =+ve , v= -ve

(d) Both x_o and v are negative ?

The letters x_o and v represent position of the object at t=0 and uniform velocity of the object respectively .

27. A body covers one –third of its journey with speed 'u' , next one –third with speed 'v' and the last one third with speed 'w' .Calculate the average speed of the body during the entire journey .

28. Two trains 120 m and 80 m in length are running in opposite directions with velocities 42 $kmhr^{-1}$ and 30 km $h^{-1.}$ .In what time they will completely cross each other ?

29. The displacement x of a particle varies with time t as x= $4t^2$ -15t +25. Find the position , velocity and acceleration of the particle at t=0 .When will the velocity of the particle become zero ? Can we call the motion of the particle as one with uniform acceleration ?

30 Check the dimensional consistency of the following equations-

(i) de – Broglie wave length, $\lambda = \frac{h}{mv}$

(ii) Escape Velocity , $v = \sqrt{\frac{2GM}{R}}$

31. Find the dimensions of a/b in the equation: F =$a\sqrt{x}$ + bt^2, where F is force , x is distance and t is time.

32 In the equation: y=a sin(ωt-kx)t and t,x stand for time and distance respectively. Obtain the dimensional formula for ω and k.

33 A physical quantity X is given by X = $\frac{a2b3}{c\sqrt{d}}$. If the percentage errors of measurement in a,b,c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in X.

34. Derive by the method of dimensions , an expression for the volume of a liquid flowing out per second through a narrow pipe .Assume that the rate of flow of liquid depends on

(i) the coefficient of viscosity η of the liquid .

(ii) the radius 'r' of the pipe.

(iii) the pressure gradient ($\frac{p}{l}$) along the pipe.

FIVE MARKS QUESTIONS

35. In an experiment refractive index of glass was observed to be 1.45 , 1.56 , 1.54 , 1.44, 1.54 and 1.53 .Calculate (i) Mean value of refractive index ; (ii) Mean absolute error ; (iii) Fractional error ; (iv) Percentage error .Express the result in terms of absolute error and percentage error.

36 The frequency ν of an oscillating drop may depend upon radius r of the drop ,density ρ of the liquid and surface tension S of the liquid .Establish an expression for ν dimensionally

37 Derive the equations of motion using calculus method.

38.Derive the equations of motion using graphical method**.**