

Home Work

Class: XI

Subject: Physics

Session: 2020 -2021

**A) Revise the chapter taught.**

**B) Do Ncert back exercise.**

**C) Do assignment given on the website.**

**D) Make a model to fight against COVID- 19 like masks and PPE kit.**

## PHYSICS HOLIDAY HOMEWORK

### SECTION 1

1. What is meant by dimensions of a physical quantity? What do you mean by dimensional equation?

2. Name at least seven physical quantities whose dimensions are  $ML^2T^{-2}$ .

3. Check the correctness of the relation

$$t = k \frac{\rho r^3}{S}$$

where  $\rho$  = density,  $r$  = radius and  $S$  = surface tension

4. Derive by the method of dimensions, an expression for the energy  $E$  of a body executing S.H.M, assuming that this energy depends upon the mass  $m$ , the frequency  $\nu$  and the amplitude of vibration  $r$ .

5. According to Newton, the viscous force acting between liquid layers of area  $A$  and velocity gradient  $\frac{dv}{dx}$  is given by

$$F = \eta A \frac{dv}{dx}$$

where  $\eta$  is a constant called coefficient of viscosity. Find the dimension of  $\eta$ .

6. In the gas equation

$$\left[ P + \frac{a}{V^2} \right] [V - b] = R * \text{ absolute temperature .}$$

Find the dimensions of constant  $a$  and  $b$ .

7. The sides of a rectangle are 6.01 m and 12 m. Taking the significant figures into account find the area of the rectangle.

8. If energy, velocity and time are fundamental units, what will be the dimension of surface tension?

9. The refractive index of water  $\mu$  has values 1.29, 1.33, 1.34, 1.35, 1.32, 1.36, 1.30 and 1.33. Calculate the mean value of  $\mu$ , the mean value of absolute error, the relative error and the percentage of error.

- 10 . A motor car starts from rest and accelerates uniformly for 10seconds to a velocity of 20m/s.It then runs at a constant speed and is finally brought to rest in 40 m with a constant acceleration .Total distance covered is 640 m .Find the value of acceleration ,retardation and total time taken.
- 11 . Youngs modulus of steel is50 Newton/m .Express it in dyne/cm.Here dyne is CGS unit of force.
12. Determine the dimensional formula for k and w in the equation  

$$x = a \sin (kx - wt)$$
where t is time and x is distance travelled.
- 13 ) A car starts from rest and accelerates uniformly for 10s to a velocity of 8m/s.It then runs at a constant velocity and is finally brought to rest in 64m with a constant retardation.The total distance covered by the car is 584m.Find the value of acceleration,retardation and total time taken
- 14 ) A body covers 4m in 3<sup>rd</sup> second and 12m in 5<sup>th</sup> second .If the motion is uniformly accelerated,How far will it travel in the next three seconds?
- 15 ) A ball is allowed to fall from the top of a tower 200m high.At the same instant,another ball is thrown vertically upwards from the bottom of the tower with a velocity of 40 m/s.When and where the two balls meet?
- 16 ) A jet plane travelling at a speed of 500km/h ejects the burnt gases at a speed of 1200km/h relative to the jet plane.Find the speed of the burnt gases with respect to a stationary observer on earth.
- 17 ) The displacement x of a particle moving in one dimension under the action of a constant force is related to time t by the equation  

$$2t = \sqrt{x} + 3$$
where x is in metres and t in seconds .Find the displacement of the particle,when its velocity is zero.
- 18 ) The v-t graphs of two objects make angles of 30° and 60° with the time axis.Find the ratio of their acceleration.
- 19 ) If the distance covered by a moving object varies directly as the time ,what conclusions could you draw about the motion and the forces?
- 20 ) A particle moves in a straight line.Its displacement t seconds after leaving the fixed point is x metres,where  $x = \frac{1}{2}t^2 + \frac{1}{2}t^3$  . Find speed of the particle,when t= 10s and the value of t for which the acceleration of the particle is twice its initial acceleration.

## SECTION 2

Write all the activities (as informed in the class) a separate interleaf copy .

Revise all the chapters taught in the class