**INDIA INTERNATIONAL SCHOOL MANGAF**

**PHYSICS -XI (HOLIDAY HOMEWORK**

1. In vander Waals’ equation:

What are the dimensions of constants ‘a’ and ‘b’?

1. Check the correctness of the relation by dimensional analysis:

λ where the letters have their usual meanings.

1. Assuming that the frequency (v) of a vibrating string depends upon the load (F) applied, length of the string (l) and mass per unit length (m), prove that
2. *The time of oscillation (t) of a small drop of liquid under surface tension depends upon the density radius r and surface tension ().*

*Prove dimensionally that t*

1. A drunkard walking in a narrow lane takes 5 steps forward and 3 steps backward, followed again by 5steps forward and 3 steps backward, and so on. Each step is 1 m long and requires 1 s Plot the x – t graph of his motion. Determine graphically and otherwise how long the drunkard takes to fall in a pit 13 m away from the start
2. An object accelerates uniformly along a straight track with acceleration of 10 m and moving with a velocity of 3
3. What is the position of the object at t = 3 s?
4. What is the velocity of the object at t = 3 s?
5. From the top of a tower 100 m in height, a ball is dropped, and at the same time another ball is projected vertically upwards from the ground with a velocity of 25 . Find when and where the two balls meet. Take g = 9.8 m .
6. A car moving along a straight highway with speed of 126 km is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform) and how long does it take for the car to stop?
7. A ball is thrown horizontally from a point 100 m above the ground with a speed of 20 m/s. find (a) the time it takes to reach the ground, (b) the horizontal distance it travels before reaching the ground, (c) velocity (direction and magnitude) with which it strikes the ground.
8. A ball is thrown at a speed of 40 m/s. at an angle of 60o with the horizontal. Find (a) the maximum height reached and (a) the range of the ball. Take g = 10 m/s2.
9. If = show that 
10. The maximum and minimum values of the resultant of two forces acting at a point are 29 N and 5 N respectively. If each force be increased by 3 N, find the resultant of these two new forces when acting at right angle to each other.
11. A man can swim with a speed of 4.0 km/h in still water. How long does he take to cross a river 1.0 km wide if the river flows steadily at 3.0 km/h and he makes his strokes normal to the river current? How far down the river does he go when he reaches the other bank?
12. The ceiling of a long hall is 25 m high. What is the maximum horizontal distance that a ball thrown with a speed of 40 m s–1 can go without hitting the ceiling of the hall?
13. A cricketer can throw a ball to a maximum horizontal distance of 100 m. How much high above the ground can the cricketer throw the same ball?
14. A Ball moving with a momentum of 5kgm/sec strikes against wall at an angle of 45 degree and is reflected at the same angle. Calculate the change in momentum.
15. A body of mass 5 kg is acted upon by two perpendicular forces 8 N and 6 N. give the magnitude and direction of the acceleration of the body.
16. Two bodies of masses 10 kg and 20 kg respectively kept on a smooth, horizontal surface are tied to the ends of a light string. A horizontal force F = 600 N is applied to (i) A, (ii) B along the direction of string. What is the tension in the string in each case?
17. What is the acceleration of the block and trolley system shown in Fig. If the coefficient of Kinetic Friction between the trolley and the surface is 0.04? What is the tension in the string? Take g = 10 m . Neglect the mass of the string. [Ans. 0.957 m , 27.13 N ]

