International Indian School, Riyadh

CLASS XI - Physics Worksheet

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1) The frequency of vibration (v) of a string may depend upon length (l) of the string, tension (T) in the string and mass per unit length (m) of the string. Use method of dimensions for establishing the formula for frequency.
2) A car moving on a straight highway with speed of 126km/hr. is brought to stop within a distance of 200m.What is the retardation of the car (assumed uniform) and how long does it take for the car to stop? (ans- -3.06m/^{s2} , 11.4 s)
3) The displacement 'x' is related by time t=$\sqrt{x}$ +3.Find velocity when t=4s and x is in m'.
4) A particle starts from rest, accelerates at a const.rate for 4 seconds, remains in uniform motion for next 4 seconds and then decelerates at a const. rate for 4s.Plot a-t and v-t graphs.
5) A car travels a distance A to B at a speed of 40 km/h and returns to A at a speed of 30 km/h.(i)What is the average speed for the whole journey?
   (ii) What is the average velocity?

7) The displacement-time graph for two particles A and B are straight lines inclined at angles of 30° and 45°with the time axis. Find $v_A : v_B$. (ans :1:⌈3)

8) The displacement [in metre] of a particular moving along x-axis is given by $x=18t+5t^2$.calculate (i) Instantaneous velocity at t=2s

(ii) Average velocity between t=2s and t=3s

(iii) Instantaneous acceleration (ans: i) 38 m/s ii)43m/s iii)10m/s^2)

9)Two masses 1kg and 4 kg are moving with equal kinetic energy.what is the ratio of their magnitudes?

10) State parallelogram law of vector addition. F ind the magnitude and direction of the resultant of two vectors.

11) The position of a particle along y-axis is given by the relation $y=3t\,i+ 2t^2\,j + 5k$ .Calculate the velocity at t= 1sec and acceleration of the particle.

12) A mass is moving in a circular path with constant speed.What is the work done in $3/4^{th}$ of a rotation?

13) A stone is dropped from the top of a tower 200m in height and at same time, another is projected vertically upward from the ground with a velocity of 50m/s. Find where and when will the two meet? (Ans: t = 4s; 121.6 m)

14) A bomb at rest explodes into three fragments of equal masses.Two fragments fly off at right angles to each other with velocities 9m/s and 12m/s. Calculate the speed of the third fragment.

15) State and prove law of conservation of momentum using (i) Newton's second law and

(ii) Newton's third law.

16) The resistance R is the ratio of potential difference V and current I. What is the % error in R if V = (100 ± 5) volt and I = (10 ± 0.2) A?

17)Find the angle of projection for a body to have same horizontal range and maximum height.

18)A motorcyclist loops a vertical loop of diameter 50m, without dropping down even at uppermost point. What is the minimum speed at lowest and highest points of the loop?

19)A spring is cut into two equal halves.How is the spring constant of each half affected?

20)A circular race track of radius 400m is banked at an angle of 10^0. If the coefficient of friction between the wheels of a race car and the road is 0.2 , what is the (i) optimum speed of the race car to avoid wear and tear on its tyres (ii) maximum permissible speed to avoid slipping?

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