INDIAN SCHOOL NIZWA

PHYSICS WORKSHEET

CHAPTER 2 – UNITS AND MEASUREMENT

DATE : NAME : CLASS XI

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1. A vehicle travels half the distance L with a speed V_1 and the other half with a speed V_2 then its average speed is ----------
   (a) $[V_1 + V_2] /2$
   (b) $[2V_1 + V_2] / [V_1 + V_2]$
   (c) $2V_1V_2/ [V_1 + V_2]$
   (d) $L[V_1 + V_2] / V_1V_2$
2. A boat is travelling in a river with velocity 6km/h (i) upstream (ii) downstream. What is the resultant velocity of the boat if the velocity of the flow of water is 4km/h ?
3. Two balls of different masses (one lighter and other heavier) are thrown vertically upwards with same initial speed. Which one rises to the greater height?
4. A ball is released from the top of a tower of height h metre. It takes T seconds to reach the ground. What is the position of the ball in T/3 seconds?
5. A body is uniformly accelerated. The body always slows down before the time, when its velocity becomes zero. Show the above statement graphically , when

(i) Both v and a are positive
(ii) V = -ve and a = +ve
(iii) V = +ve and a = -ve
(iv) Both v and a are negative.

6. When two bodies move uniformly towards each other, the distance between them diminishes by 16m in every 10s. If the bodies move with velocities of the same magnitude and in the same direction as before, the distance between them will increase by 3m every 5s. What is the velocity of each body?
7. From the top of a multi-storeyed building 40m tall , a boy projects a stone vertically upwards with an initial velocity of 10m/s such that it eventually falls to the ground. After how long will the stone strike the ground?
8. The displacement of a particle is proportional to the cube of the time elapsed. How does the acceleration of the body depend on the time elapsed?
9. A motor car covers 1/3 part of the total distance with velocity 10km/h and the second 1/3 with a velocity 20km/h and the rest 1/3 with the velocity 60km/h. What is the average speed of the car?
10. A parachute bails out from an aeroplane and after dropping through a distance of 40 m, he opens the parachute and decelerates at $2m/s^2$. If he reaches the ground with a speed of 2m/s, how long is he in air? At what height did he bail out from the plane?

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1. Which of the following is the most precise device for measuring g length:
   a) A vernier calliper with 20 divisions on the vernier scale?
   b) A screw gauge of pitch scale 1mm and 100 divisions on the circular scale?
   c) An optical instrument that can measure length to within a wave length of light?
2. State the number of significant figures in the following :
   a) 0.007 b)3.66×10^4 kg c) o.0234 gcm^{-3} d) 5.0390
3. Write the order of magnitude of the following:
   a) Velocity of light b) Par sec c) 1 AU
4. Choose the correct formula for the displacement (y) of a particle executing periodic motion:
   (i) $Y = r \sin (2\pi/T)t$
   (ii) $Y = r \sin vt$
   (iii) $Y = r \sin (2\pi/r)\, t$
   (iv) $Y = r \sin (2\pi / v)t$.
   Where T , r, v and t stand for time – period , amplitude , velocity and time respectively.
5. A photon is quantum of radiation with energy $E = h\nu$, where ν is the frequency and h is the Plank's constant. Find the dimension of h.
6. If force (F), velocity (V) and time (T) are chosen as basic units, how will be the dimension of mass represented?
7. Check the correctness of the equation by dimensional analysis, $\lambda = h/mv$, where the letters have their usual meaning.
8. Each side of a cube is measured to be 7.203. What is the total surface area and the volume of the cube to approximate significant figures?
9. The length, breadth and thickness of a block of wood were measured with the help of a meter scale. The result after calculating the errors are as given below. Find the percentage error in the volume of the block.
   l = 15. 12±0.01 cm, b = 10.15 ±0.01 cm and h = 5.28 ±0.01 cm.
10. Check the correctness of the equation V = (F/M) where V is the velocity, F is the tension and M is mass per unit length.
11. If $X = a + bt + ct^2$, where x is in the metres and t in seconds, what are units of a , b and c?
12. E, m,l and G denote energy , mass , angular momentum and gravitational constant respectively. Determine the dimension of EL^2/m^5G^2. Given the dimension of angular momentum , $[l] = [ML^2T^{-1}]$.