

Sharjah Indian School, Sharjah

HOLIDAY ASSIGNMENT in Physics for Class XI (2016 - 17)

1. The bodies A and B having their masses in the ratio 1:2 possess the same linear momentum. What is the ratio of K.E of A to B?
2. A ball thrown horizontally from a certain height strikes the ground 500m away. Find the height from which it was thrown & with what velocity. (Take $g=10\text{m/s}^2$)
3. The time of flight of a projectile is 10 seconds. Its range on a horizontal plane is 100m. Calculate the angle of projection and the velocity of projection.
4. What is the maximum horizontal distance that a ball thrown with a speed of 60 m/s can go without hitting the roof of a long hall 30m high? (Take $g=10\text{m/s}^2$)
5. A ball of mass 0.5kg moving with a speed of 20m/s collides with an identical ball at rest. After collision the direction of each ball makes an angle of 30° with the original direction. Find the speed of each ball after collision.
6. A body of mass 40kg is moving up an inclined plane with a uniform velocity when a force of 460N is applied. If the plane is inclined to the horizontal by an angle of 45° , calculate the coefficient of kinetic friction between the surfaces.
7. A bullet of mass 20g is fired from a gun of mass 10kg with a velocity of 180m/s. Find the velocity of recoil of the gun. Find the force required to stop the gun before it moves 20cm.
8. A mass-less string pulls a mass of 20kg upward against gravity. The string would break if subjected to a tension greater than 400N. What is the maximum acceleration with which the mass can be moved upward?
9. If the percentage error in the measurement of length of a pendulum is 4% and time period of oscillations is 2%, then calculate the percentage error in measuring the acceleration due to gravity of that place.
10. A stationary shell explodes into three fragments A, B and C of masses in the ratio 1:2:3. 'A' travels with a speed of 60m/s and B with a speed of 30m/s in two directions inclined at an angle of 120° to each other. Find the speed of the fragment C.
11. A gas bubble from an explosion under water, oscillates with a period T which depends on the pressure (P), density (ρ) and total energy of explosion (E). Derive the correct equation for the period, using the method of dimensions.
12. A railway carriage of mass 9000 kg moving with a speed of 36 km/hr collides with a stationary carriage of the same mass. After the collision, the carriages get coupled and move together. What is their common speed after collision? What type of collision is this?
13. The displacement (in meters) of a particle, moving along X-axis is given by $x = 18t + 5t^2$. Calculate the instantaneous velocity and acceleration at $t = 2$ sec.
14. The velocity of a particle moving along the X-axis is given by $v = p + qt^3 - rt^4$, where t is the time. Find the dimensions of the constants p, q and r.
15. What should be the angle between two vectors of equal magnitude such that the resultant of them also has the same magnitude as of either?

Happy Vacation! From Dept. of Physics SIS