

O. P. JINDAL SCHOOL, RAIGARH (CG) 496 001, INDIA

Phone: 07762-227042, 227293, (Extn. 227001 - 49801, 02, 04, 06, 09); Fax: 07762-262613; website: www.opjsrgh.in; e-mail: opjsraigarh@jspl.com

CLASS: IX: Physics

1. Two trains start at the same instant from two stations A and B respectively with initial velocities u_1 and u_2 . Both move with uniform velocity, meet each other and then reach stations B and A after time t_1 and t_2 respectively. Show that $u_1:u_2 = \sqrt{t_2} : \sqrt{t_1}$
2. A train moving with uniform retardation takes 20 sec and 30 sec to travel two successive quarter kilometer. How much further will it travel before coming to rest?
3. A particle moving in a straight line with uniform acceleration moves through distance of 80 m and 100 m in two successive seconds. Find the velocity at the beginning of the first second and the acceleration. Find also the distance moved in the next second.
4. A train begins to move with an acceleration of 2 m/s^2 when a man is 9 meters away from a door of the train. The man begins to run and catches it in 3 seconds. What is his acceleration?
5. A hammer weighing 5 kg descending from a height of 0.5 m struck a nail and stops in $\frac{1}{10}$ th second. Find the force.
6. A golf ball of mass 60 gm is hit by a club. The ball acquires a speed of 50 m/s. Find the impulse of the force on the ball. If the force be constant and the impact lasts for 3×10^{-3} sec, calculate the magnitude of the force in Newton.
7. A batsman deflects a ball by an angle of 45° without changing its initial speed which is equal to 54 kmph. What is the impulse imparted to the ball? Mass of the ball is 0.15 kg.
8. A bullet of mass 10 gm is moving with a velocity of 100 m/s. After passing through a mud wall 50 cm thick, its velocity reduces to 20 m/s. Calculate the average resistance of the wall in Newton.
9. A ball A is dropped from a height 44.1 m high cliff. Two seconds later, another ball B is thrown downwards from the same place with some initial speed. The two balls reach the ground together. Find the speed with which the ball B was thrown.
10. Communication satellite move in orbits of radius 44,000 km around the earth. Find the acceleration of such a satellite, assuming that the only force acting on it is due to the earth. Mass of earth = 6×10^{24} kg.