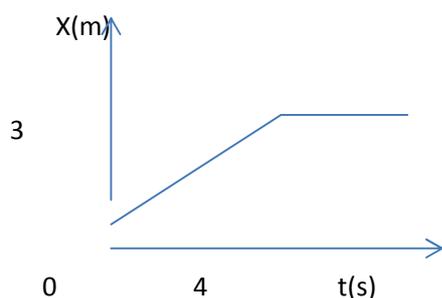


Class IX – PHYSICS (Force and Laws of Motion)

1. The driver of a three – wheeler moving with a speed of 36 km/hr sees a child standing in the middle of the road and brings his vehicle to rest in 4 sec just in time to save the child. What is the average retarding force on the vehicle? The mass of the three – wheeler is 400 kg and the mass of the driver is 65 kg.
2. A man with a mass of 60 kg running along the rails with a velocity of 6 m/s jumps into a car of mass 90 kg standing on the rails and stops there. Find the velocity with which the car will start travelling along the rails.
3. A hunter has a machine gun that can fire 50 gm. bullets with a velocity of 900 m/s. A 40 kg tiger springs at him with a velocity of 10 m/s. How many bullets must the hunter fire into the tiger in order to stop in his track?
4. A constant retarding force of 50 N is applied to a body of mass 20 kg moving with a speed of 15 m/s. How long does the body take to stop?
5. A force of 9 N pulls a block of mass 4 kg through a rope of mass 0.5 kg. The block is resting on a smooth surface. Calculate the force of reaction exerted by the block on the rope.
6. 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.
7. A cricket ball of mass 0.2 kg moving with a uniform velocity of 20 m/s is brought to rest by a player in 0.1 sec. Find the impulse of the force acting on the ball and the average force applied by the player.
8. A machine gun has a mass of 10 kg. It fires 30 gm. Bullets at a rate of 6 bullets per second with a speed of 400 m/s. What force in Newton must be applied to the gun to keep it in position?
9. A stream of water flowing horizontally with a speed of 15 m/s gushes out of a tube of cross sectional area 10^{-2} m², and hits at a vertical wall nearby. What is the force exerted on the wall by the impact of water, assuming it does not rebound?
10. The adjacent fig. shows the position time graph of a particle of mass 4 kg. What is the:



- a) Force on the particle for $t < 0$, $t > 4s$, $0 < t < 4s$?
 - b) Impulse at $t = 0$ and $t = 4s$? (Consider one dimensional motion only).
11. A block of 10 kg is pulled at a constant speed on a rough horizontal surface by a force of 20 N. Calculate the coefficient of kinetic friction. Given $g = 10 \text{ m/s}^2$.
 12. A cricket ball rolling on ice with a velocity of 5.6 m/s comes to rest after travelling 8 m. Find the coefficient of friction. Given, $g = 9.8 \text{ m/s}^2$.