

ASSIGNMENT FOR THE SESSION 2012-2013 Class: IX Subject: Science & Technology: Physics

- 1) What do you mean by inertia? How is it related with inertial mass?
- 2) Interpret the meaning of balanced and unbalanced force with examples.
- 3) Define momentum. State its S.I. unit. On what factors does a momentum of a body depends?
- 4) How Newton's first law of motion is interpreted from Newton's second law of motion?
- 5) Why does passenger experience a forward push when a running bus stops suddenly?
- 6) Explain why does a cricket player moves his hands backwards, while catching a fast cricket ball.
- 7) Would the normal reaction and weight is termed as a action and reaction forces for a body kept stationary on a horizontal table?
- 8) A ship whose mass is $5 \times 10^7 \text{kg}$ is initially at rest is pulled by a force of $15 \times 10^4 \text{N}$ through a distance of 10m. If the resistance due to water is negligible then what is the speed of the ship.
- 9) A bullet of mass 10g is fired with a rifle. The bullet takes 0.003s to move through its barrel and leaves it with a velocity of 300m/s. What is the force exerted on the bullet by the rifle.
- 10) A 20g bullet pierce through a plate of mass $m_1 = 1 \text{kg}$ and then comes to rest inside a second plate of mass $m_2 = 2.98 \text{kg}$. It is found that the two plates initially at rest, now moves with equal velocities. Find the percentage loss in the initial velocity of the bullet when it is moving between m_1 and m_2 . Neglect any loss of material of the plates due to action of the bullet.
- 11) Explain why a car does not move when the force is applied on it by a person present inside the car?
- 12) A bullet of mass 20g starts from rest from one end of the barrel of gun 1.5m long and weighing 40kg. The bullet leaves at the other end with a velocity of 350m/s. Calculate (i) the time taken by the bullet to leave the gun and (ii) the velocity of the recoil of the gun.
13. What is the difference between distance and displacement? Give two points.
14. Prove graphically and analytically following equations of motion:
(i) $V = U + at$ (ii) $v^2 = u^2 + 2as$ (iii) $S = ut + \frac{1}{2}at^2$
14. Draw velocity time graph when the acceleration is non-uniform. Also draw a velocity time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.
16. Abdul while driving school computes the average speed for his trip to be 20 Km/hr. On his return trip along the same route there is less traffic and average speed is 40Km/hr. What is the average speed for Abdul's trip?
17. Draw velocity time graph for a body moving with constant acceleration and non-zero initial velocity.
18. Give one example of a situation in which a body has a certain average speed but its average velocity is zero.
19. Joseph jogs from one end A to the other end B of a straight 300m road in 2 minutes 30 seconds and then turns around jogs 100m back to point C in another 1 minute. What are Joseph's average speed and Velocities in jogging from (a) from A to B (b) from A to C?