PHYSICS
CH:9 FORCE AND LAWS OF MOTION

Name: _____ Date:_____ Class: IX Sec: ___

I FILL IN THE BLANKS

1. The product of mass and velocity of a body is called----------and its SI unit is ----------.

2. ----------force slows down a moving bicycle when we stop pedalling it.

3. ----------is the property of bodies to resist the change in their state of rest or motion.

4. Action and reaction forces act on ----------but they are equal in magnitude.

5. The velocity with which gun moves in the backward direction is known as ----------velocity.

6. Inertia of a body depends on its ----------.

II SHORT ANSWER TYPE

1. Two trucks, one loaded and other empty are moving with same velocity on a straight road. Which of them requires a greater force to stop at same time and why?

2. Place a water filled tumbler on a tray. Hold the tray and turn around as fast as you can. Why does the water spill?

3. A bullet fired against a glass window pane makes a hole in it without cracking it. Give reason

4. A runner presses the ground with his feet before he starts his run. Identify action and reaction in this situation.

5. Explain with reasons:

b. A jet aero plane releases a lot of hot gases before taking off.

c. We press the ground while walking forward.

6. Explain why a bicycle stops if we stop pedaling.

7. If we take out a piece of paper from under a book with a jerk, the book will not move. Why?

8. The mass of an object A is 6 kg and that of another object b is 34 kg. Which of the two objects, A or B has more inertia?

II NUMERICALS

1. Calculate the force required to impact to a car with a velocity of 30 m s^{-1} in 10 seconds. The mass of the car is 1,500 kg.

2. A cricket ball of mass 70 g moving with a velocity of 0.5 m s^{-1} is stopped by player in 0.5s. What is the force applied by player to stop the ball ? .

3. What will be acceleration of a body of mass 5 kg if a force of 200 N is applied to it?
4. Two balls A and B of masses m and 2m are in motion with velocities 2v and v respectively .Compare
a) Their inertia
b) Their momentum
c) The force needed to stop them at the same time.
5. What force would be needed to produce an acceleration of 1 m s^{-2} on a ball of mass 1kg?
6. What is the acceleration produced by a force of 5 N exerted on an object of mass 10 kg?
7. How long should a force of 100 N act on a body of 20 kg so that it acquires a velocity of 100 m s^{-1} ?
8. A 1,000 kg vehicle moving with a speed of 20 m s^{-1} is brought to rest in a distance of 50 m, (i) Find the acceleration; (ii) Calculate the unbalanced force acting on the vehicle
9. Which would require greater force: accelerating a 10 g mass at 5 m s^{-2} or 20 g mass at 2 m s^{-2}?
10. Find the recoil velocity of a gun having mass equal to 5 kg, if a bullet of 25gm acquires the velocity of 500m/s after firing from the gun

11. A bullet of 5 gm. is fired from a pistol of 1.5 kg. If the recoil velocity of pistol is 1.5 m/s, find the velocity of bullet.

12. A boy of 50 kg mass is running with a velocity of 2 m/s. He jumps over a stationary cart of 2 kg while running. Find the velocity of cart after jumping of boy.

13. Calculate the velocity of a missile having mass of 100 kg, if it attains a momentum of 5000 kg m/s when fired from a rocket gun?

14.Aboy of mass 50 kg running at 5 m/s jumps on to a 20 kg trolley travelling in the same direction at 1.5 m/s .What is their common velocity?

15. A car of mass 2400 kg moving with a velocity 20 m/s is stopped in 10s on applying brake. Calculate the retardation and retarding force.