

SAINIK SCHOOL GOPALGANJ
CLASS – XI
ASSIGNMENT ON LAWS OF MOTION

SECTION A : MULTIPLE CHOICE QUESTION (TOTAL 05 QUESTIONS)

1. A bullet of mass 0.04 Kg moving with speed of 90 m/s enters a heavy wooden block and is stopped after a distance of 60 cm. What is the average resistive force exerted by block on bullet?

- a) 270 N
- b) 300 N
- c) 350 N
- d) 400 N

2. A machine gun fired a bullet of mass 40 g with a speed of 1200 m/s. The person holding the gun can exert a maximum force of 144 N on it. The number of bullets that can be fired are

- a) 3
- b) 4
- c) 2
- d) 5

3. The maximum acceleration of the train in which a box lying on its floor will remain stationary is. (Take coefficient of friction = 0.15)

- a) 1.5
- b) 6
- c) 4
- d) 2

4. A rocket lift off with mass 20,000 Kg is blasted upwards with an initial acceleration of 5ms^{-2} . The initial thrust is _____ $\times 10^5\text{N}$

- a) 3
- b) 4
- c) 4.4
- d) 5

5. A batsman pulls back his hand is related to

- a) First Law of motion
- b) Second Law of motion
- c) Third Law of motion
- d) Law of Inertia

SECTION B : SHORT ANSWERS QUESTIONS (TOTAL 05 QUESTIONS)

6. Give two practical applications from daily life for the concept of Impulse.
7. While walking we press the ground with our feet slightly slanted in the backward direction. Why?
8. Explain the Horse Cart problem with Laws of Motion.
9. Derive an expression for the acceleration of a body sliding down a rough inclined plane.
10. It is easier to pull a lawn roller than to push it. Why?

SECTION C : LONG ANSWER QUESTIONS (TOTAL 05 QUESTIONS)

11. What is Banking of roads? Why it is needed? Obtain an expression for the maximum speed with which a vehicle can safely drive on banked road?
12. A body is traversing in vertical circle. Find the velocity and tension at top, bottom and middle point of the vertical circle.
13. Derive expression for work done by a body against friction sliding up and down the inclined plane.
14. Two bodies of different masses are connected by an inextensible string on a massless pulley. Find the acceleration and tension in the string.
15. Explain the Elevator and man problem in the situations when the elevator is accelerated up, down and when the string is broken.