



PHYSICS

BOOKS - NCERT PHYSICS (ENGLISH)

FORCE AND LAW OF MOTION



1. Which of the following statement is not correct for an object moving along a straight path in an accelerated motion? A. Its speed keeps changing

B. Its velocity always changes

C. It always goes away from the earth

D. A force is always acting on it

Answer: C

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2. According to the third law of motion , action

and reaction

A. always act on the same body B. always act on different bodies in opposite directions C. have same magnitude and direction D. act on either body at normal to each other

Answer: B

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3. A goalkeeper in a game of football pulls his hands backwards while holding the ball shot at the goal. This enables the goalkeeper to

A. exert larger force on the ball

B. reduce the force exerted by the ball on

hands

C. decrease the rate of change on

momentum

D. Both B & C

Answer: D



4. The inertia of an object tends to cause the object

A. to increase its speed

B. to decrease its speed

C. to resist any change in its state of

motion

D. to decelerate due to friction

Answer: C

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5. A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is

A. accelerated

B. uniform

C. retarded

D. along circular tracks

Answer: A

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6. An object of mass 2kg is sliding with a constant velocity of $4ms^{-1}$ on a frictionless horizontal table. The force required to keep the object moving with the same velocity is

A. 32N

B. ON

C. 2N

D. 8N

Answer: B

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7. smoke precipitator work on the principal of :

B. energy

C. momentum

D. velocity

Answer: C



8. A water tanker filled up to $\frac{2}{3}$ of its height is moving with a uniform speed. On sudden application of the brake, the water in the tank would

A. move backward

B. move forward

C. be unaffected

D. rise upwards

Answer:

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Short Answer

1. There are three solids made up of aluminum, steel and wood, of the same shape and same volume. Which of them would have highest inertia?

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2. Two balls of the same size but different matetials, rubber and iron are kept on the smooth floor of a moving train. The brakers are applied suddenly to stop the train . Will the balls start rolling? If so, in which direction?

Will they move with the same speed? Give

reasons for your answers.

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3. Two identical bullets are fired one by a light rifle and another by a heavy rifle with the same force. Which rifle will hurt the shoulder and why?



4. A horse continues to apply a force in order to move a cart with a constant speed. Explain why?



5. Suppose a ball of mass m is thrown vertically upward with an initial speed v, its speed decreases continuously till it becomes zero. Thereafter, the ball beigns to fall downward and attains the speed v again before striking the ground. It implies that the magnitude of initial and final momentums of the ball are same. Yet, it is not an example of conservation of momentum. Explain why?

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6. Velocity versus time graph of a ball of mass 50g rolling on a concrete floor shown in (figure) Calcualte the acceleration and

frictional force of the floor on the ball.





7. A truck of mass M is moved under a force F. If the truck is then loaded with an object equal to the mass of the truck and the driving force is halved, then how does the acceleration

change?



8. Two friends on roller-skates are standing 5m apart facing eachother. One of them throws a ball of 2kg towards the other, who catches it. How will this activity affect the position of the two? Explain your answer.



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9. Water sprinkler used for grass lawns beigns

to rotate as soon as the water is supplied.

Explain the principle on which it works.



Long Answer

1. Using second law of motion, derive the relation between force and acceleration. A bullet of 10g strikes a sand-bag at a speed of 10^3ms^{-1} and gets embedded after travelling

5 cm.Calculate

(i) the resistive force exerted by the sand on the bullet (ii) the time taken by the bullet to come to rest.



2. Derive the unit of force using the second law of motion. A force of 5N produces an acceleration of $8ms^{-2}$ on a mass m_1 and an acceleration of $24ms^{-2}$ on a mass m_2 . What acceleration would the same force provide if

both the masses are tied together?



3. What is momentum? Write its SI unit.
Interpret force in term of momentum.
Represent of the following graphically
(a) momentum versus velocity when mass is fixed.

(b) momentum versus mass when velocity is constant.



