PHYSICS

BOOKS - MAXIMUM PUBLICATION

MOTION AND LAWS OF MOTION

Example

1. What will be the result when a man tries to move a vehicle by pushing it, standing inside

the vehicle ? The vehicle moves/the vehicle doesn't move.

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2. What if the same vehicle is pushed from outside. Will the vehicle moves?

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3. What is inertia of rest ?

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4. What is inertia of motion ?

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5. Find out reasons for the situations

Place some carom board coins in a pile. Using the striker, strike out the coin at the bottom. What do you observe ? What is the reason ?

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6. Find out reasons for the situations

When a running bus is suddenly stopped, passengers standing in the bus show a tendency to fall forward

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7. Find out reasons for the situations

place a small brick on a plank. When the plank is pulled suddenly the brick remains in the same position as before.

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8. Find out reasons for the situations

When a running bus is suddenly stopped, passengers standing in the bus show a tendency to fall forward

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9. Find out reasons for the situations

Accidents that happen to passengers who do not wear seat belts are more fatal.

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10. Find out the reasons

An athlete doing a long jump starts his run from a distance.

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11. Find out the reasons

A running elephant cannot change its direction suddenly.

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12. It is dangerous for loaded vehicles to negotiate a curve in the road without reducing speed. What is the reason ?

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13. It is more difficult to roll a filled tar drum than a empty drum

Which of two has a greater mass ?

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14. It is more difficult to roll a filled tar drum than a empty drum

Which has greater inertia ?

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15. If a tennis ball (mass 58.5g) and a cricket ball (mass 163 g) are the reach a certain distance when hit with a cricket bat, Which is

to be hit with greater force ? The tennis ball / the cricket ball

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16. Will the change of velocity be the same in Mass & Inertia ?

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17. A car of 1000kg moves with a velocity of 10 m/s. On applying brakes it comes to rest in 5s.

Then what are its initial momentum and final momentum?

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18. A hockey ball of mass 200g hits on a hockey stick with a velocity 10m/s. Calculate the change in momentum if the ball bounces back on the same path with the same speed

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19. A loaded lorry of mass 12000kg moves with a velocity of 12m/s. its velocity becomes 10m/s after 5s

What is the initial momentum and what is the final momentum?

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20. A loaded lorry of mass 12000kg moves with a velocity of 12m/s. its velocity becomes 10m/s

after 5s

what is the change in momentum?

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21. A loaded lorry of mass 12000kg moves with a velocity of 12m/s. its velocity becomes 10m/s after 5s

what is the rate of change of momentum?

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22. A constant force is applied for 2 s on a body of mass 5kg. As a result, if the velocity of the body is changed from 3m/s to 7m/s, find out the value of the applied force.

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23. A car moving with a speed of 108km/h comes to rest after 4s on applying brake. If the mass of the car including the passengers is

1000kg, what will be the force apllied when brake is applied ?

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24. Velocity of an object of mass 5kg increases from 3m/s to 7m/s on applying a force continuously for 2s. Find out the force applied. If the duration for which force acts is extended to 5s, what will be the velocity of the object then?

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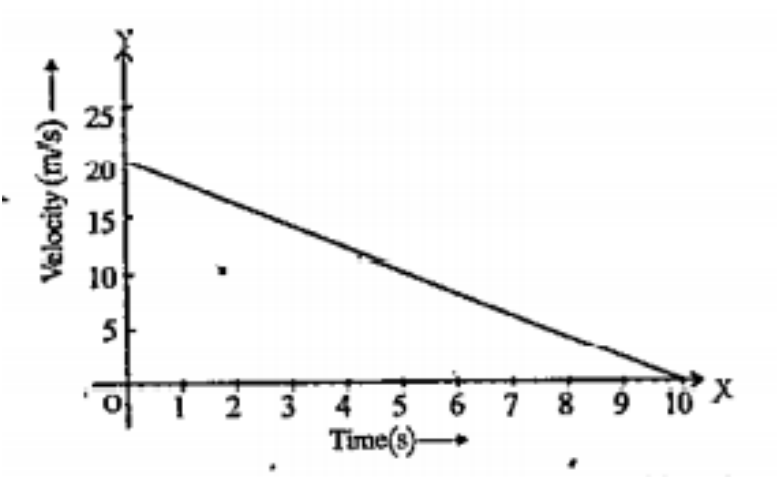
25. Velocity-time graph of an object of mass 20 g, moving along the surface of a long table is given below.

What is the frictional force experienced by the object ?



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26. m_1 and m_2 are the masses of two bodies. When a force of 5 N is applied on each body, m_1 gets an acceleration of $10m/s^2$ and m_2, $20m/s^2$. If the two bodies are tied together and the same force is applied, find the acceleration of the combined system.

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27. During a pole vault jump, the impact is reduced by falling on a foam bed.

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28. Hay or sponges are used while packing glasswares. This helps to avoid breaking of glasswares due to collision.

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29. Karate experts move their hands with great speed to chop strong bricks.

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30. Write down the action and reaction while we are walking on a floor ?

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31. Are the action and reaction equal and opposite ?

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32. A bullet is fired with a velocity v from a gun of mass M. what will be the recoil velocity of the gun if the mass of the bullet is m ?

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33. Suppose a child of mass 40 kg running on a horizontal surface with a velocity of 5m/s. Jumps on a stationary skating board of mass 3kg while running. If there is no other force acting horizontally (assuming the frictional

force on the wheels to be zero), calculate the velocity of the combined system of child and the skating board.

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34. Does the velocity of an object moving with a uniform speed along a circular path change ?

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35. How does change in velocity happen in uniform circular motion ? Due to change in speed / change in direction / due to change in both speed and direction.

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36. In hammerthrow, before the hammer is let go off, why is it whirled around along a circular path ?

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37. How does the speed of a giant wheel in an amusement park ?

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38. What are the balanced forces acting on a book at rest on a table ?

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39. To remove the dust from a carpet, it is suspended and hit with a stick. What is the scientific principle behind it ?

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40. A car and a bus are travelling with the same velocity. Which has greater momentum ? Why?

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41. On the basis of Newton's third law of motion, explain the source of force that helps to propel a rocket upward.

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42. A car travels with a velocity of 15m/s. The total mass of the car and the passengers in it is 1000 kg. find the momentum of the car

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43. When a bullet is fired from a gun , the gun gives a kick in the backwark direction Explain .

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44. A standing passenger falls backwards when the bus starts suddenly.

Which Newtons law gives the above concept.State the law.

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45. Give reason

We slip on a mossy surface.

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46. Prepare and present an experiment to illustrate inertia of rest.

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47. Find out situations from our daily life to explain the law of conservation of momentum and note them down.

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48. Fill in the blanks

As the time interval decreases, rate of change of momentum .....

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49. Fill in the blanks

The force required to produce an acceleration of $1\frac{m}{s^2}$ on a body of mass 1 kg is .....

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50. Correct the statement if any wrong.

An object moving with uniform speed along a circular path undergoes velocity changes due to the change in speed.

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51. What is meant by momentum ?

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52. Write down the equation for calculating momentum.

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53. A body of mass 50 kg stars from rest. If its velocity changes to 15 m/s after 10 seconds,

calculate the change in momentum ? What will be the rate of change of momentum ?

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54. Define circular motion and uniform circular motion.

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55. What is the relation between centripetal force and centripetal acceleration ?

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56. We are familiar with Newton's laws of motion.

State Newton's second law of motion.

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57. Derive the equation for force on the basis of Newton's second law.

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58. A car of mass 1000 kg runs with a velocity of 10 m/s. what is the momentum of this car?

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59. A loaded lorry of mass 1500 kg moves with a velocity of 12 m/s. within a small interval of the time the velocity becomes 10 m/s.

What is the initial momentum of the lorry ?

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60. A loaded lorry of mass 1500 kg moves with a velocity of 12 m/s. within a small interval of the time the velocity becomes 10 m/s.

What is its final momentum ?

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61. A loaded lorry of mass 1500 kg moves with a velocity of 12 m/s. within a small interval of the time the velocity becomes 10 m/s.

What is the change in momentum ?

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