



SHIKSHA CLASSES

Sub. : Science
Std. IX (CBSE)

Question Paper
9 : Force and Laws of Motion

Total Marks : 30
Time : 1 Hr.

Section A(Each 1 marks)

Q.1) **The seat belts are provided in the cars so that if the car stops suddenly due to an emergency breaking, the persons sitting on the front seats are not thrown forward violently and saved from getting injured. Can you guess the law due to which a person falls in forward direction on the sudden stopping of the car?**

- a) Newton's first law of motion b) Newton's second law of motion
c) Newton's third law of motion d) Newton's law of gravitation

OR

When a balloon held between the hands is pressed, its shape changes. This happens because.

- a) Balanced forces act on the balloon b) Unbalanced forces act on the balloon
c) Frictional forces act on the balloon d) Gravitational force acts on the balloon

Q.2) **The momentum of a body of given mass is proportional to its**

- a) velocity b) size c) shape d) all of these

OR

Read the given statements and select the correct option :

Statement 1 : The forces of action and reaction always appear due to actual physical contact of two bodies.

Statement 2 : A particle can move only under the action of a force.

- a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
c) Statement 1 is true but statement 2 is false.
d) Both statements 1 and 2 are false.

For question numbers 3 two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- a) Both A and R are true, and R is correct explanation of the assertion.

b) Both A and R are true, but R is not the correct explanation of the assertion.

c) A is true, but R is false.

d) A is false, but R is true

Q.3) **Assertion (A)** : Mass is a measure of inertia of the body in linear motion.

Reason (R) : Greater the mass, greater is the force required to change its state of rest or motion.

Q.4) **Assertion** : If the net external force on the body is zero, then its acceleration is zero.

Reason : Acceleration does not depend on force. (c)

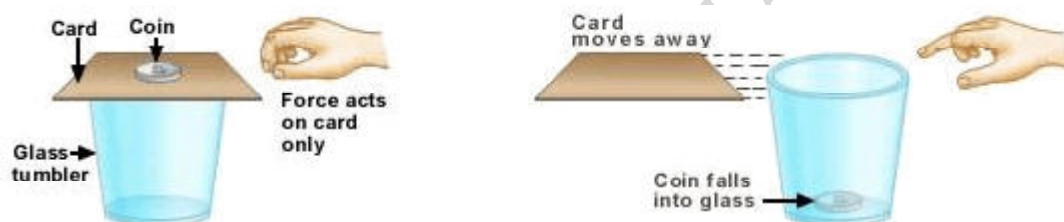
Q.5) **Assertion** : A rocket works on the principle of conservation of linear momentum.

Reason : For two bodies system when there is a change in momentum of one body, the same change occurs in the momentum of the second body but in the opposite direction (a)

Q.6) **Read the following and answer any two questions from (i) to (iii)**

2

We take a glass tumbler and place a thick square card on its mouth as shown in A coin is then placed above this card in the middle. Let us flick the card hard with our fingers. On flicking, the card moves away but the coin drops into the glass tumbler



Experiment to demonstrate inertia

i) **Give reason for the above observation.**

- a) The coin possesses inertia of rest, it resists the change and hence falls in the glass.
- b) The coin possesses inertia of motion; it resists the change and hence falls in the glass.
- c) The coin possesses inertia of rest, it accepts the change and hence falls in the glass.
- d) The coin possesses inertia of rest, it accepts the change and hence falls in the glass.

ii) **Name the law involved in this case.**

- a) Newton's second law of motion.
- b) Newton's first law of motion.
- c) Newton's third law of motion.
- d) Law of conservation of energy

iii) **If the above coin is replaced by a heavy five rupee coin, what will be your observation. Give reason.**

- a) Heavy coin will possess more inertia so it will not fall in tumbler.
- b) Heavy coin will possess less inertia so it will fall in tumbler.
- c) Heavy coin will possess more inertia so it will fall in tumbler.
- d) Heavy coin will possess less inertia so it will not fall in tumbler

- Q.7) A man getting down a running bus, falls forward because
- a) due to inertia of rest, road is left behind and man reaches forward
 - b) due to inertia of motion upper part of body continues to be in motion in forward direction while feet come to rest as soon as they touch the road
 - c) he leans forward as a matter of habit.
 - d) of the combined effect of all the three factors stated in (a), (b) and (c)
- Q.8) A hockey player pushes the ball on the ground. It comes to rest after travelling certain distance because
- a) the player stops pushing the ball.
 - b) balanced force acts on the ball.
 - c) the opposing force acts on the ball.
 - d) none of these
- Q.9) Forces of action and reaction are:
- a) equal and in same direction
 - b) equal and in opposite direction
 - c) unequal and in same direction
 - d) unequal and opposite
- Q.10) An object of mass 16 kg is moving with an acceleration of 3 m/s^2 . Calculate the applied force. If the same force is applied on an object of mass 24 kg, how much will be the acceleration?
- a) 48 N , -2 m/s^2
 - b) 98 N, 2 m/s^2
 - c) -2 m/s^2 , -48 N
 - d) 48 N, 2 m/s^2
- Q.11) An iron ball and aluminium ball has same mass:
- a) inertia of iron is greater than aluminium
 - b) both the ball have same inertia
 - c) inertia of iron is less than that of Aluminium
 - d) none of these
- Q.12) Which of the following statements is correct?
- Statement 1:** Mass of a body is defined as the quantity of matter contained in it.
- Statement 2:** Mass of a body remains constant and does not change from place to place.
- Statement 3:** Mass of a body cannot be zero.
- Statement 4:** S.I unit of mass is kg.
- a) Only statement 1 and 2 are correct
 - b) Only statement 1 is correct
 - c) Only statement 3 and 4 are correct
 - d) All statements are correct
- Q.13) If the mass of the body is doubled and its velocity becomes half, then the linear momentum of the body will
- a) become double
 - b) remain the same
 - c) become half
 - d) become four times
- Q.14) A goalkeeper in a football game pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to
- a) increase the rate of change of momentum
 - b) decrease the rate of change of momentum
 - c) increase the force exerted by the balls on the hands
 - d) exert larger force on the ball

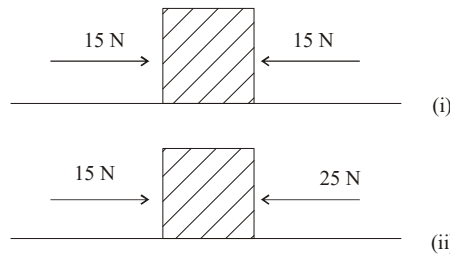
Section B (Each 2 marks)

Q.15) State Newton first law of motion.

Q.16) When are the forces acting on a body said to be balanced ? Give an example. What type of change can the balanced forces bring about in an object ?

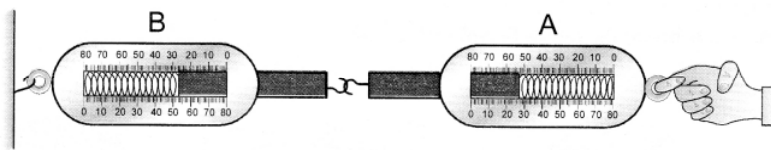
OR

Look at the diagrams given and answer the following questions. In which case will the object move and in which direction ? Give reason in support of your answer.



Section C (Each 3 marks)

Q.17) Look at the diagram and answer the following questions :



- When a force is applied through the free end of the spring balance A, the reading on the spring balance A is 15 g wt. What will be the measure of the reading shown by spring balance B ?
- Write reasons for your answer.
- Name the force which balance A exerts on balance B and the force of balance B on balance A.

OR

A cricket player lowers his hands while catching a fast moving ball. Explain. Why ?

Q.18) When a car weighing 800 kg was moving on a horizontal road with a speed of 30 ms^{-1} , its breaks stopped working. The car came to rest after travelling a distance of 150 m. Find

- the retardation of the car.
- frictional force exerted by the ground on the car.

Section D (5 marks)

Q.18) Derive the mathematical relation of Newton's second law of motion.

OR

Describe Newton's first law of motion in detail, giving examples.

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