

## Physics - FSC Part 1 Physics Chapter 3 Short Questions Preparation

Q1. Write solid reasons for the loss of kinetic energy in an inelastic collision.

**Ans 1:** In case of inelastic collision, the loss of kinetic energy is due to

1. Friction of ball with floor
2. Friction of ball with air
3. sound

Q2. State law of inertia?

**Ans 1:** Newton's 1st law of motion is called law of inertia

It states that a body at rest will remain at rest, and a body moving with uniform velocity will continue to do so, unless acted upon by some unbalanced external force.

Q3. What is the effect on the speed of a fighter plane chasing another when it opens the fire? What happens to the speed of pursued plane when it returns the fire?

**Ans 1:** When the fighter plane opens fire, its momentum will be in back direction due to reaction force in backwards direction and therefore its speed will decrease.

When the pursued plane opens fire in the backward direction, the momentum will act on the plane in forward direction due to reaction and therefore its speed will increase.

Q4. What are the factors upon which force due to water depend?

**Ans 1:** Force due to water flow depends upon viscosity of the media and velocity of the fluid.

Q5. Discuss the condition of equilibrium ?

**Ans 1:**

**Newtons 1st Law of motion:** This Law states that "A body at rest will remain at rest and a body in motion will continue its motion with uniform velocity unless it is acted upon by some unbalanced external force

If  $F = 0$  Then  $a = 0$

**Explanation:** The 1st law of motion is also known as law of inertia. The inertia is the property of a body which opposes any change in its state of motion or rest. Actually, when some force is applied on a body for changing its state of rest or uniform motion, then the body will offer resistance against this change. In the word, We can say that all the bodies try to maintain its state of rest or continue its uniform motion due to inertia. That is the why the newtons 1st law is also known as law of inertia.

**Examples:** When we give a jerk to the branch of a tree, then the fruit falls down. It is because, when we give a jerk, the branch of the tree comes into motion suddenly.

When a bus starts motion suddenly, the passengers experience a push in the back ward direction It is because, when the bus starts motion suddenly, the lower parts of the passenger in contact with the seats also come into motion. while the upper parts of the passengers are at remain at the rest In this attempt, they falls in the back words directions

**Newton's 2nd Law of motion:**

**Statements:** This law states that, "when a force is applied on a body, then acceleration is produced in the body in the direction of applied force and inversely proportional to the mass of the body.

**Explanation:** The 1st Law of motion gives us the quantitative measurements of force, While the 2nd law of motion gives us the quantitative measurements of forces. now if the direction of motion of the body and direction of motion of the body and direction of forces are the same, then its velocity and acceleration increases. If the direction of motion of the body and direction of force are opposite in direction of force are opposite in direction, then the velocity and acceleration of the body will decrease gradually and finally become zero and the body will come to rest

**Example of Newton's 2nd law of motion:**

When a body falls on a solid floor from the top of a building, the body experiences or feels great pain. It is because, when the body falls on the floor, its acceleration becomes zero suddenly and the body faces a huge force for a very short period of time

**Newton's 3rd Law of motion:**

This Law states that for every action, there is always a reaction. These forces are equal in magnitude but opposite in direction.

**Explanation:** This law tells us that no body can experience a force from its surroundings, until this body exerts any force on its surroundings. It means that forces are exerted in pairs.

---

Q6. Why ballistic missiles are not useful for long ranges?

**Ans 1:** Ballistic missiles are unpowered and unguided missiles. For long ranges, air friction is not negligible and sometimes the force of air friction is more than gravity. It affects both horizontal as well as vertical motions of the missile.

---

Q7. Discuss the sign of acceleration due to gravity relative to velocity, while the object is in air?

**Ans 1:** When the object is thrown vertically upward, it will move against the direction of gravity. The sign of acceleration due to gravity relative to velocity will be taken as negative. When the object is falling downward, it will move along the direction of gravity. The sign of acceleration due to gravity relative to velocity will be taken as positive.

---

Q8. An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.

**Ans 1:** When the object is thrown vertically upward, it will move against the direction of gravity. The sign of acceleration due to gravity relative to velocity will be taken as negative. When the object is moving downward, the sign of acceleration due to gravity will be positive.

---

Q9. Define linear momentum? Express Newton's 2nd Law in terms of momentum?

**Ans 1:**

---

Q10. Find a relation for magnitude of velocity of projectile and direction of projectile?

**Ans 1:**

---