

Short Answer Type Questions – I

[2 marks]

Q.1. The earth attracts an apple. Does the apple also attract the earth? If it does, why does the earth not move towards the apple?

Ans. According to Newton's third law of motion, action and reaction are equal and opposite. It means that the force on the apple due to earth's attraction is equal to that on the earth due to apple's attraction. But we know, $\text{acceleration} \propto 1/m$. As the mass of the earth is very large as compared to that of the apple, the acceleration experienced by the earth will be so small that it will not be noticeable.

Q. 2. Mention any four phenomena that the universal law of gravitation was able to explain.

Ans. The universal law of gravitation was able to explain successfully

1. the force that binds us to the earth.
2. the motion of the moon around the earth.
3. the motion of planets around the sun.
4. the tides due to the moon and the sun.

Q. 3. When does an object show weightlessness?

Ans. Weightlessness is a state when an object does not weigh anything. It occurs only when a body is in a state of free fall under the effect of gravity alone.

Q. 4. Why does a body reach the ground quicker at poles than at the equator when dropped from the same height?

Ans. The acceleration due to gravity is more at the poles than at the equator. The time taken for a body is less if the acceleration due to gravity is more when the initial velocities and the distance travelled are the same. So, when dropped from the same height a body reaches the ground quicker at the poles than at the equator.

Q. 5. What is the source of centripetal force that a planet requires to revolve around the sun? On what factors does that force depend?

Ans. Gravitational force. This force depends on the product of the masses of the planet and sun and the distance between them.