

## FORCES AND LAWS OF MOTION

1 How does force of gravitation between two objects change when distance between them is reduced to half?

Ans Gravity will become four times if distance between them is reduced to half.

2 Gravitational force acts on all objects in proportion to their masses. Why then, a heavy object doesn't fall faster than a light object?

Ans Acceleration due to gravity is constant and doesn't depend upon mass of object. Hence, heavy objects don't fall faster than light objects.

3 Earth and Moon are attracted to each other by gravitational force. Does Earth attract Moon with a force greater or smaller or same as force with which Moon attracts Earth? Why?

Ans Yes. According to universal law of gravitation, two objects attract each other with equal force but in opposite direction.

- 4i The mass of one object is doubled? - Gravitational force gets doubled.  
 ii Distance between objects is doubled and tripled? - Gravitational force becomes one-fourth and one-ninth respectively.  
 iii Masses of both objects are doubled? - Gravitational force gets quadrupled.

5a Both are true, Statement-2 is correct explanation of Statement-1.

6 Define acceleration due to gravity.

Ans Acceleration gained by an object due to gravitational force.

7 Earth attracts falling apple, but do you think, that apple also attracts Earth? If it is, why Earth doesn't move towards apple?

Ans Apple also attracts Earth. It is not noticeable as Mass of Earth is massive and acceleration produced is very small as that in apple.

8 What is the importance of universal law of gravitation?

Ans Gravitation force of Earth ties terrestrial objects to Earth. This explains attractive force between two objects <sup>having</sup> mass.

9 At what height above surface, value of gravity would be half of what it is on surface of Earth.

Ans 2649.6 km.

10 Value of universal gravitational constant - ~~B~~

b Doesn't change from place to place.

11 Radius of Earth is about 6400 km and that of Mars is about 3200 km. Mass of Earth is about 10 times the mass of Mars. An object weighs 200 N on Earth's surface. Then its weight on surface of Mars will be - a. 80 N.

12<sup>th</sup> Statement - 1 is true, 2 is false.