Homework

(1) The force of gravitation between 2 objects is inversely proportional to the square of the distance between them therefore, the gravity will become 4 times if distance between them is reduced to half.

(2) All objects fall on ground with constant acceleration called acceleration due to gravity. It is constant & doesn't depend upon the mass of an object Hence, heavy objects don't fall faster than light objects

(3) According to the universal law of gravitation, 2 objects attract each other with equal force but in opposite direction.

(4) (i) $F = \frac{Gm_1m_2}{R^2}$ (ii) $F = \frac{G \times (2m_1)m_2}{R_2} = 2f$

(iii) $F_m = \frac{G \times (2m_1) \times (2m_2)}{R_2} = \frac{4Gm_1m_2}{R_2}$: Ans.

Date
Page 111

a: (1)

(1) Acceleration due to gravity is the acceleration gained by an object due to gravitational force.

(2) The Earth attracts an apple & so does the apple attracts the earth & with an equal & opposite force. Mass of the earth is extremely massive as compared to that of the moon. So, the acceleration produced is very small as compared to that in the apple. Hence, the motion of the earth towards the apple is not noticeable.

(3) The gravitational force of earth ties the terrestrial objects to the earth.

(4) $V = \frac{-GM}{R+h} = -5.4 \times 10^7 \rightarrow (i)$

$g = \frac{GM}{(R+h)^2} = 6 \rightarrow (ii)$

$\Rightarrow \frac{5.4 \times 10^7}{(R+h)} = 6$

$\Rightarrow R+h = 9000 \text{ km}$

$\Rightarrow h = 2600 \text{ km}$

(1) (b) (2) (d)