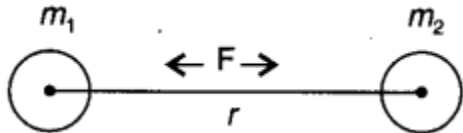# Motion under Gravity and Acceleration due to Gravity

Gravitation and gravity

(a) Gravitation. It is an attractive force acting between two mass bodies of universe separated by a distance. The force of attraction between two bodies of masses m1 and m2, when their centres are separated by a distance r depends upon

$$F \propto m_1 m_2$$

$$\propto \frac{1}{r^2}$$

$$F = \frac{G m_1 m_2}{r^2}$$

where, G = gravitational constant = $6.67 \times 10^{-11} \, \text{Nm}^2 \, \text{kg}^{-2}$.

(b) Gravity. It is special case of gravitation, if one of the attracting body is the earth. Gravity is the force of attraction between earth and any object lying on or near its surface. The gravity is equal to the weight of a body.

(c) Acceleration due to gravity. Acceleration produced in a body by the force of gravity, is called the acceleration due to gravity. Its symbol is g.
For a body of gravitational mass m,
g=W/m or W= mg