

Chapter 10

GRAVITATION

EXAMPLE- 4:

If the acceleration due to gravity on earth is 9.81 m/s^2 and radius of the Earth is 6370 km . Find the mass of the earth? $[G = 6.67 \times 10^{-11} \text{ Nm}^2 / \text{kg}^2]$.

Solution:

Given $g = 9.81 \text{ m/s}^2$; $R = 6370 \text{ km} \Rightarrow R = 6370 \times 10^3$

$$G = 6.67 \times 10^{-11}$$

$$g = \frac{GM}{R^2}$$

$$M = \frac{gR^2}{G} = \frac{9.81 \times (6370 \times 10^3)^2}{6.67 \times 10^{-11}}$$

$$M = 5.97 \times 10^{24} \text{ kg}.$$