Question

The value of acceleration due to gravity at Earth's surface is 9.8ms^{-2}. The altitude above its surface at which the acceleration due to gravity decreases to 4.9ms^{-2}, is close to :

(Radius o f earth $=6.4 \times 10^6$m)

A 1.6×10^6m

B 6.4×10^6m

C 9.0×10^6m

D 2.6×10^6m

Solution

Correct option is D)

$$(\frac{GM}{R+h})^2 = \frac{GM}{2R^2}$$

$R + h = \sqrt{2}R$

$h = (\sqrt{2} - 1)R$

$\approx 2.6 \times 10^6$m