

A ball weighing 10 gm hits a hard surface vertically with a speed of 5 ms^{-1} and rebounds with the same speed. The ball remains in contact with the surface for 0.01s . The average force exerted by the surface on ball is :

A 100 N

B 10 N

C 1 N

D 0.1 N

Correct option is B)

Given,

$$v = 5\text{m/s}$$

$$m = 10\text{g} = 0.01\text{kg}$$

$$t = 0.01\text{s}$$

Newton 2nd law,

$$F = \frac{\Delta P}{t}$$

$$F = \frac{mv - (-mv)}{t} = \frac{2mv}{t}$$

$$F = \frac{2 \times 0.01 \times 5}{0.01} = 10\text{N}$$

$$F = 10\text{N}$$

The correct option is B.