

### Answer on Question#69875 –Physics– Mechanics – Relativity

A 100g mass moving with velocity of 20m/s strikes a wall and is brought to rest in 0.15s. Find the impulse due to the force exerted on body by the wall. Calculate the average stopping force on the body.

**Solution.** According to the condition of the problem  $m = 0.1kg$  – mass body;  $v_i = 20 \frac{m}{s}$  – the initial velocity of the body;  $v_f = 0 \frac{m}{s}$  – the final velocity of the body;  $\Delta t = 0.15s$  – the interaction time. Considering the body wall as a closed system use the law of conservation of momentum as

$$m\Delta v = F\Delta t$$

(using the scalar form), where  $F$  – the average stopping force on the body. Therefore impulse due to the force exerted on body by the wall

$$F\Delta t = 0.1 \cdot |0 - 20| = 2kg \frac{m}{s}$$

and average stopping force on the body

$$F = \frac{m\Delta v}{\Delta t} = \frac{2}{0.15} = \frac{40}{3}N$$

**Answer.**  $2kg \frac{m}{s}; \frac{40}{3}N$ .

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