5.14 Two billiard balls A and B, each of mass 50g and moving in opposite directions with speed of 5m s^{-1} each, collide and rebound with the same speed. If the collision lasts for 10^{-3}s, which of the following statements are true?

(a) The impulse imparted to each ball is 0.25 kg m s^{-1} and the force on each ball is 250 N.

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(b) The impulse imparted to each ball is 0.25 kg m s^{-1} and the force exerted on each ball is 25 × 10^{-5} N.

(c) The impulse imparted to each ball is 0.5 Ns.

(d) The impulse and the force on each ball are equal in magnitude and opposite in direction.

(14) Impulse $= \Delta p = \dfrac{50}{1000}\left(5 - (-5)\right) = 0.5\ Ns$

Ans. (c), (d)