

Chapter 12 Momentum. (Revision Questions page 348). Multiple Choice Answers

Q	Ans	Explanation
1	B	By the law of conservation of momentum, the final momentum must equal the initial (which was zero).
2	A	$p_i = p_f$ $m_A u_A + m_B u_B = m_A v_A + m_B v_B$ $0 + 0 = 50v_A + 75 \times (+2)$ $50v_A = -150$ $v_A = -3 \text{ ms}^{-1} \text{ (to the left)}$
3	B	By the law of conservation of momentum if the momentum of one cart is mv , the momentum of the other cart must be the same magnitude but opposite direction, hence $-mv$.
4	D	If the cannon recoils backwards, the projectile is moving forward with the same momentum but opposite direction. This is because momentum has to be conserved, and as the cannon and ball would have been at rest (zero momentum) at the start, the sum of the momenta from the ball and cannon at the end must add to zero.
5	B	$p_i = p_f$ $m_{\text{boat+diver}} \times u_{\text{B+D}} = m_B v_B + m_D v_D$ $480 \times (+2) = 400v_B + 80 \times (-3)$ $+960 = 400v_B - 240$ $+1200 = 400v_B$ $v_B = +3 \text{ ms}^{-1}$

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