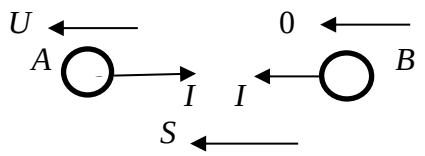
Question Number	Scheme	Marks
1.		
(a)	CLM: oe $mU = mS + 3mS$ **OR** $A: -I = m(S-U)$ and $B: I = 3mS$ AND eliminate I to give $-3mS = m(S-U)$ oe	M1
	$S = \frac{1}{4}U$ or 0.25 U	A1 (2)
(b)	For A: $\pm m(\frac{1}{4}U - U)$	M1A1**ft**
	$\frac{3}{4}mU$	A1 (3)
Alternative	For B: $\pm 3m\frac{1}{4}U$	M1A1**ft**
	$\frac{3}{4}mU$	A1 (3)
		(5)
	Notes	
1(a)	M1: CLM equation with correct terms, condone sign errors and cancelled m's or consistent extra g's **N.B.** If they use 2 impulse-momentum equations, each equation must have the correct terms but condone sign errors.They must then eliminate the impulse to produce an equation in m, U and S only. **N.B.** Allow the use of v or similar for S in the working but must use S for their answer.
	A1: cao (A0 if m's not cancelled)
1(b)	M1: Impulse-momentum for A or B, with correct terms, condone sign errors and allow S for final speed but M0 if m omitted or extra g
	A1**ft**: Correct expression in terms of m and U, ft on the **magnitude** of their S.
	A1 cao (must be positive and a multiple of mU)