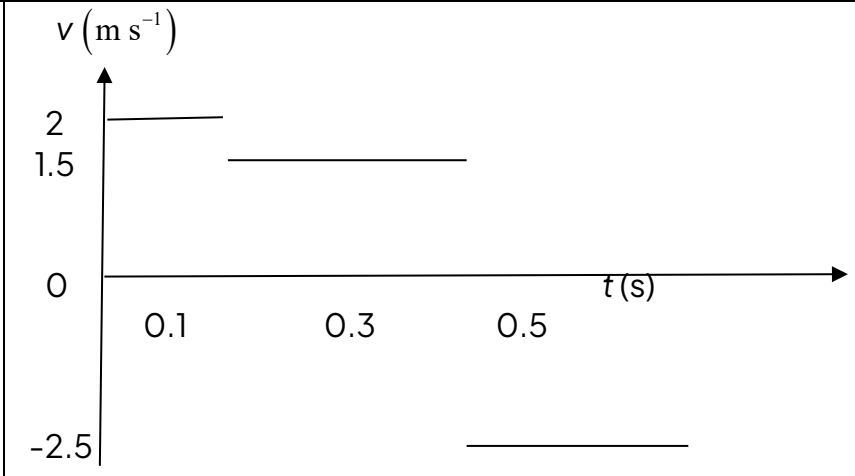
Question Number	Answer	Mark
3(a)	0 (m)	B1 (1)
3(b)	1 (m)	B1 (1)
3(c)		B1 1st line B1 2nd line B1 3rd line B1 figures (4)
3(d)	$\pm 0.04(-2.5-1.5)$	M1A1
	0.16 Ns or kg m s^{-1}	A1 B1 (4)
		(10)
	Notes	
3(a)	B1: cao	
3(b)	B1: cao (must be positive)	
3(c)	B1: Horizontal line between 0 and 0.1	
	B1: Horizontal line between 0.1 and 0.3, with a smaller *v* value than the first line.	
	B1: Horizontal line between *t* = 0.3 and *t* = 0.5, with a negative *v* value.	
	B1: All figures clearly marked and correct, **dependent** on all three lines being **horizontal**.	
	N.B. Allow dotted vertical lines. Subtract max 1 if any solid vertical lines are included from FIRST B1 earned.	
3(d)	M1: Impulse-momentum expression using their velocities either side of *t* = 0.3, which must be non-zero and different and come from use of $v = \pm\frac{s}{t}$, condone sign errors. M0 if 0.04 omitted or *g* included.	
	A1: Correct expression	
	A1: cao (must be positive)	
	B1: correct units seen	