Name of the Student:_____

Max. **Marks : 18 Marks**

Time : 18 Minutes

Mark Schemes

Q1.

Question	Answer	Additional guidance	Mark
	identification of equation and substitution (1) 450 = m x 0.35 rearrangement and evaluation (1) (m=) $\frac{450}{0.35}$ 1300 (kg)	accept values which round to 1300 (kg) e.g. 1286 (kg) award full marks for the correct answer without working	2 AO2.1

Q2.

Question number	Answer	Additional guidance	Mark
	Two stage calculation		(4) AO2
	substitution$_1$ (1)	use of $v^2 - u^2 = 2ax$ OR ½ $mv^2 = mgh$	
	$(v^2 - 0 =) 2 \times 10 \times 3.8$	76	
	evaluation of v (1)		
	$(v =) 8.7$ (m/s)	allow numbers that round to 8.7 e.g. 8.718	
	substitution$_2$ (1)		
	$0.40 = m \times 8.7$	use of $p = mv$	
	rearrangement and evaluation (1) $(m =) 0.046$ (kg)	allow numbers that round to 0.046 e.g. 0.04598 award full marks for correct answer without working.	

Q3.

	Answer	Additional guidance	Mark
	selection (1) $p = m \times v$ substitution (1) $6.6\ (\times 10^{-26}) \times 480$ evaluation (1) 3.2×10^{-23} (kg m/s)	allow mom(entum) = mass x velocity allow numbers that round to 3.2×10^{-23} e.g. 3.168×10^{-23} award full marks for the correct answer without working $6.6\ (\times 10^{-26}) \times 480$ seen scores MP1 and MP2, 2 marks 3.2 to any other power of ten scores MP1 and MP2, 2 marks	(3) AO2

Q4.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) $(t =)\ \dfrac{10 - 6.2}{2.5}$	$\dfrac{3.8}{2.5}$ allow $\dfrac{6.2 - 10}{2.5}$ or $\dfrac{-3.8}{2.5}$	2 AO2.1
	evaluation (1) $(t =)\ 1.5\ (s)$	$1.52\ (s)$ allow $-1.5(2)\ (s)$ award full marks for correct answer without working	

Question number	Answer	Additional guidance	Mark
(ii)	substitution OR rearrangement (1) $(-)10^2 = 2 \times (-)\,4.4 \times x$	$(x =)\ \dfrac{v^2 - u^2}{2 \times a}$ $(x =)\ \dfrac{(-)10^2}{2 \times (-)\,4.4}$	2 AO2.1
	evaluation (1) $(x =)\ 11\ (m)$	allow values that round to 11	

		(m) e.g. 11.36 (m) ignore negative sign in answer line accept 1.1(36) for one mark award full marks for correct answer without working	

Q5.

Question number	Answer	Additional guidance	Mark
	substitution (1) $(t^2 =)$ $\dfrac{2 \times 1.4}{10}$ evaluation (1) $(t =)$ 0.53 (s)	 0.28 allow numbers that round to 0.53 e.g. 0.52915 award full marks for correct answer without working.	(2) AO2

Q6.

Question	Answer	Additional Guidance	Mark
	substitution or rearrangement (1) $3500 = \dfrac{53 \times 4\ (-\ 53 \times 0)}{time}$ or $(time =) \dfrac{change\ in\ momentum}{force}$	in either order $3500 = \dfrac{212}{time}$ $(time =) \dfrac{53 \times 4}{3500}$ $(time =) \dfrac{212}{3500}$ $(t =) \dfrac{mv - mu}{F}$	3 AO2.1
	evaluation (1) 6.06×10^{-2} (s) or 0.0606 (s) rounded to 2sf (1) 6.1×10^{-2} (s) or 0.061 (s)	accept 0.06057 (s) 0.06 (s) accept their calculation rounded to 2sf 0.060 scores 2 marks (truncation) award three marks for the correct answer given to 2sf without working	