Que	estion	Scheme	Marks	AOs	
4	(a)	Equation of motion for <i>P</i>	M1	3.3	
		$5mg - \frac{10mg}{3} = 5ma$	A1	1.1b	
		$a = \frac{g}{3}$	A1	1.1b	
		Equation of motion for Q or whole system	M1	3.4	
		$\frac{10mg}{3} - Mg = M\frac{g}{3}$ or $5mg - Mg = (5m+M)\frac{g}{3}$	A1ft	1.1b	
		$M = \frac{5m}{2}$	A1	1.1b	
			(6)		
(b)		$\frac{5}{6} = \frac{1}{2} \times \frac{g}{3} T^2$	M1	2.1	
		T = 0.71 or 0.714 (s)	A1	1.1b	
			(2)		
(c)		e.g. Air resistance would slow the particle down so it would take longer to hit the ground oe	M1	2.4	
		$T_1 > T$	A1	3.5a	
			(1)		
		(10 marks)			
Notes:					
(a)	M1	Correct number of terms, condone sign errors			
	A1	Correct equation			
	A1	cao			
	M1	Correct number of terms, condone sign errors			
	A1ft	Correct equation ft on their a			
	A1	cao			
(b)	M1	Complete method to find T using their a (provided it's not g)			
	A1	cao			
(c)	M1	An appropriate comment about the effect of air resistance			
	A1	cao			