	Scheme	Marks	ΔOs
			A03
5(a)	Using the model and horizontal motion: $s = ut$	M1	3.3
	$12 = T \ge 45 \cos 10^{\circ}$	A1	1.1b
	T = 0.2707	A1	1.1b
	Using the model and vertical motion: $s = ut + \frac{1}{2}at^2$	M1	3.4
	$s = 45T\sin 10^{\circ} + 4.9T^{2}$	A1	1.1b
	Correct strategy: sub for T and find s	M1	3.1b
	d = 3.5 - 2.4752 - 1	M1	3.1b
	= 2.5 (cm) (2 SF)	A1	2.2a
		(8)	
(b)	Using the model and vertical motion: $v = u + at$	M1	3.3
	$v = 45\sin 10^\circ + 9.8T$	A1	1.1b
	Speed = $((45\cos 10^{\circ})^2 + v^2)^{0.5}$	M1	3.1b
	46 (m s ⁻¹) (2 SF)	A1	1.1b
		(4)	
(c)	Model does not take account of air resistance.	B1	3.5b
	Model does not take account of the size of the tennis ball	B1	3.5b
		(2)	
	(14 mark		
Notes:			
 (a) M1: Using the model and correct strategy A1: Correct equation in <i>T</i> only A1: 0.271 or better M1: Using the model and correct strategy A1: Correct equation M1: Sub for <i>T</i> and solve for <i>s</i> 			

M1: Correct method to find *d* using their *s*

A1: 2.5 is the only correct answer

(b)

M1: Using the model and correct strategy

A1: Correct equation

M1: Must have found a *v* and usual rules apply. Square root is needed.

