Question number	Answer	Notes	Marks
2 (a)	300 (metres);		1
(b)	0.554; any answer given to 2 sf; correct answer = 0.55 (s) e.g. (0.50+0.62+0.52+0.58+0.55)/5 = 0.554 (s) = 0.55 (s) to 2 s.f.	mark independently	2
(c)	difference in distance is 180 m; recall of equation: speed = distance / time taken; substitution; correct evaluation; correct answer = 330 (m/s) e.g. speed = (300 – 120)/0.55 speed = 180/0.55 speed = 327.2727… (m/s)	allow use of standard symbols e.g. v = d/t condone s for v, s for d ECF incorrect distance and ECF incorrect time from (b) answer is 327.2727… (m/s) answer is 324.90… (m/s) if 0.554(s) is used	4
(d)	human reaction time;	accept alternative valid variables e.g. wind speed, temperature, humidity, air pressure	1

Total for Question 2: 8 marks

Question number			Answer	Notes	Marks
5	(a)		Any FIVE from: MP1. measure current and voltage to work out power; MP2. use ammeter and voltmeter;	accept 'known power' accept 'power meter' or 'joulemeter' accept idea of 'known voltage'	5
			MP3. measure temperature increase AND time taken;	accept measure initial and final temperature for temp increase accept idea of waiting for highest temperature after power switched off accept 'use a stopwatch' for time taken	
			MP4. find total energy (E = Pt or E = VIt); MP5. measure mass of substance; MP6. use a balance; MP7. rearrange to give c = E / m Δθ; MP8. plot a temperature-time graph; MP9. use gradient (so c = P/(m × gradient));		
	(b)	(i)	34 (ºC);		1

		(ii)	any TWO from:
			  MP1. bonds between particles are weakened or broken;
			
			  MP2. particles go from regular to irregularly packed/EQ;
			  MP3. particles go from vibrating (about a fixed position) to sliding past each other / EQ;
				allow particles get (slightly) further apart /EQ
				
				ignore references to KE
					2

		(iii)	reference to different temperature changes in the same time; different specific heat capacities/EQ;	accept recognition that the states are different condone incorrect SHC comparisons between phases	2

Total for Question 5: 10 marks