Length & Time

Mark Scheme 1

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	General Physics
Sub-Topic	Length & Time
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 1

Time Allowed: **43 minutes**

Score: **/36**

Percentage: **/100**

1 **(a** **(i)** 18 m / s B1

(ii) (0.90 s is) driver's time to react B1

(b) **(i)** (a =) (v – u) / t OR Δv / t OR either in words OR (18 – 0) / 3.1 OR 18 / 3.1
5.8 m / s^2 A1
OR
Values from any correct points on graph (C1)
Answer dependent on accuracy of chosen points (A1)

(ii) Evidence of use of: (distance =) area under graph e.g. 1 / 2bh
(18 × 0.9) + (0.5 × 3.1 × 18) C1
44 m A1

(c) (Without seat belt, driver:) e.g. keeps moving (forwards) / does not stop / has inertia / has momentum B1

(Driver) hits steering wheel / windscreen / dashboard

[Total: 9]

2 **(a** dots farther apart (in 2nd time interval) owtte B1

(b) **(i)** (average speed =) *d* ÷ *t*, in any form, e.g. words, symbols, numbers C1

0.095 m / s A1

(ii) (average speed =) 0.29 m / s B

(c) (*a* =) (*v* – *u*) ÷ *t* C1

= (candidate's **(b)(ii)** – candidate's **(b)(i)**) ÷ 0.02 C1

correct value calculated from candidate's values in **(b)(i)(ii)**, expect 9.5 m / s^2 A1

3 **(a** metre rule, tape measure, (surveyor's) laser measurer, trundle wheel
tape is too vague, accept rule(r) B1

(b) $M = \rho V$ in any form or ρV in words, symbols or numbers C1

(mass = 1.2×76.4 =) 92 kg A1

(c) mass (of air) in room decreases B1

(because) air expands / vol of air increases / density of air decreases / appropriate use of $pV = nRT$ OR pressure argument e.g. pressure would have increased (with constant volume) if mass constant B1

any ONE from: B1
some air leaves room
molecules collide harder or more (often)
molecules move faster / have more energy
molecules move further apart NOT molecules expand

[Total: 6]

4 **(a** Period: 1.81 s OR 1.8 s as mean value
OR 1.8 s as most common reading / the mode B1

(b) Time a minimum of 2 (successive) oscillations B1
Divide result by the number of oscillations B1
OR
Count no. of oscillations in at least 20 s (B1)
Divide the time by the number of oscillations
OR Divide no. of oscillations by time and find reciprocal (B1)
2 of: B2
Repeat (several times) and find mean
Time with reference to fixed / fiducial point or top or bottom of oscillation
Check / set zero of stop-watch
Show knowledge of what is meant by one oscillation

[Total: 5]

5	**(a)**	scalar, vector, scalar, vector, scalar		B3
	(b)	(average speed) = distance / time OR 18/1.2	C1	
		= 15 m / s	A	
	(ii)	(time =) (total) distance / speed OR 21/15	C1	
		= 1.4 s	A1	
	(iii)	air resistance / friction / force opposing motion	B1	
	(iv)	velocity changes because direction changes	B1	[9]