



---

**PHYSICS**

**0625/32**

Paper 3 Core Theory

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

---

**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2017 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

© IGCSE is a registered trademark.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

---

This document consists of **12** printed pages.

Question	Answer	Marks
1(a)	flexible rule/tape measure/measuring tape	<b>B1</b>
1(b)(i)	58.75 (s)	<b>B1</b>
1(b)(ii)	speed = distance $\div$ time in any form	<b>C1</b>
	0.85 (m/s)	<b>A1</b>
1(b)(iii)	7.12 (s)	<b>B1</b>
	<b>Total:</b>	<b>5</b>

Question	Answer	Marks
2(a)(i)	6500 (g)	<b>B1</b>
2(a)(ii)	density = mass $\div$ volume in any form	<b>B1</b>
	1.3	<b>A1</b>
	g/cm <sup>3</sup>	<b>B1</b>
2(b)	density (of brush) is less (than) density of paint	<b>B1</b>
	<b>Total:</b>	<b>5</b>

Question	Answer	Marks
3(a)	weight = mass $\times$ gravitational field strength in any form	C1
	20.0 $\times$ 10.0	C1
	200 (N)	A1
3(b)(i)	moment = force $\times$ (perpendicular) distance (from pivot) in any form	C1
	180.0 $\times$ 2.5	C1
	450 (Nm)	A1
3(b)(ii)	2nd box down ticked decrease the length of the arm holding the sun-shade	B1
	<b>Total:</b>	<b>7</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4(a)	radiation	<b>B1</b>
4(a)(ii)	thermometer near door or B is at higher temperature	<b>B1</b>
	any 2 from:  darker colours are better absorbers (of thermal energy) darker colours are better emitters (of thermal energy) white/lighter colours are better reflectors (of thermal energy) white/lighter colours are poorer absorbers (of thermal energy) white/lighter colours are poorer emitters (of thermal energy)	<b>B2</b>
4(b)	any 3 from:  cold air is denser (than warm air) cold air will fall the cold air is warmed and expands less dense/warm air rises or replaces the cold air (forming a) convection (current)	<b>B3</b>
	<b>Total:</b>	<b>7</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(a)	any two from: more collide with walls more often so pressure is greater (inside bag)	<b>B2</b>
5(b)	density (of sea water) depth (of sea water) (in either order)	<b>B2</b>
5(c)(i)	barometer	<b>B1</b>
5(c)(ii)	3.4 or 1.3 seen	<b>C1</b>
	2.1	<b>C1</b>
	1035.7	<b>A1</b>
	<b>Total:</b>	<b>8</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
6(a)(i)	normal line drawn at $90^\circ$ to mirror by eye	<b>B1</b>
6(a)(ii)	reflected ray drawn with $i = r$ by eye	<b>B1</b>
6(a)(iii)	angle of incidence = angle of reflection	<b>B1</b>
6(a)(iv)	Mark is for the explanation linked to candidate's diagram. e.g. if answer is YES they should state that the reflected ray hits/reaches the (other)driver/car or can be seen	<b>B1</b>
6(b)(i)	ray refracted toward the normal	<b>B1</b>
6(b)(ii)	angle of incidence labelled	<b>B1</b>
	angle of refraction labelled	<b>B1</b>
	<b>Total:</b>	<b>7</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
7(a)(i)	visible light	<b>B1</b>
	gamma rays	<b>B1</b>
7(a)(ii)	wavelength	<b>B1</b>
	frequency	<b>B1</b>
7(b)	(sound) is a longitudinal wave (radio waves are transverse) (sound) needs a medium to be transmitted (but radio waves do not)	<b>B1</b>
7(c)	any four from: only award 4 marks if valid procedure  (use tape measure) to measure distance of at least 100 m blocks banged together stopwatch started when blocks are SEEN to hit stopwatch stopped when sound heard time taken recorded/calculated speed = distance ÷ time	<b>B4</b>
	<b>Total:</b>	<b>9</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
8(a)	At least 2 curves drawn from one end of magnet to the other	<b>B1</b>
	pattern is symmetrical by eye above and below middle of magnet	<b>B1</b>
	Arrow from N to S	<b>B1</b>
8(b)	any 2 from: magnet/block/metal placed in coil coil connected to d.c. supply (d.c.) current in coil (for short time)	<b>B2</b>
8(c)	tick in 4th box steel	<b>B1</b>
	<b>Total:</b>	<b>6</b>



<b>Question</b>	<b>Answer</b>	<b>Marks</b>
9(a)	arrow drawn pointing from C to D	<b>B1</b>
	arrow on /near side CD pointing upwards	<b>B1</b>
9(b)	any 2 from: increase (size of) current increase strength of magnet increase number of turns in coil	<b>B2</b>
9(c)(i)	electrons	<b>B1</b>
9(c)(ii)	current is smaller	<b>B1</b>
	(as) resistance of coil/wire is greater	<b>B1</b>
	<b>Total:</b>	<b>7</b>

Question	Answer	Marks
10(a)	in any order: cells/battery (connected) incorrectly voltmeter used instead of ammeter thermistor symbol used instead of LDR symbol	<b>B3</b>
10(b)(i)	resistance decreases as brightness increases	<b>B1</b>
10(b)(ii)	(resistance at 60% full brightness) = 2000 (ohms)	<b>B1</b>
	resistance = voltage ÷ current in any form e.g. $I = \frac{V}{R}$	<b>C1</b>
	8.0 ÷ 2000	<b>C1</b>
	$4 \times 10^{-3}$ (A)	<b>A1</b>
	<b>Total:</b>	<b>8</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
11(a)	protects circuit if current too large	<b>B2</b>
11(b)(i)	copper	<b>B1</b>
11(b)(ii)	$\frac{N_s}{N_p} = \frac{V_s}{V_p}$ in any form	<b>C1</b>
	$\frac{16}{224} = \frac{N_s}{308}$ or $\frac{224}{16} = \frac{308}{N_s}$	<b>C1</b>
	22 (turns)	<b>A1</b>
	<b>Total:</b>	<b>6</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
12(a)	proton	<b>B1</b>
	positive or +1	<b>B1</b>
12(a)(ii)	tick in third box	<b>B1</b>
12(b)	idea of mass being halved, e.g. 0.5	<b>C1</b>
	0.25 (mg)	<b>A1</b>
	<b>Total:</b>	<b>5</b>