Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/31**

Paper 3 Core Theory **May/June 2018**

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 International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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

PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

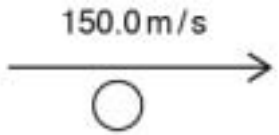
GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	72 (s)	**1**
1(b)	(average speed =) distance ÷ time	**1**
	120 ÷ 54	**1**
	2.2(2) (m / s)	**1**
1(c)	area under line **OR** three areas indicated **OR** (dist =) (av.) speed × time **OR** 1/2 (b + h) × L	**1**
	$\frac{1}{2} \times 3.5 \times 4.0$ **OR** 7 (m) seen **OR** 6×3.5 OR 21 (m)	**1**
	6×3.5 **OR** 21 (m) **AND** $\{\frac{1}{2} \times 3.5 \times 4.0$ **OR** 7 (m)$\}$ **OR** 14 (m)	**1**
	(21 + 14 =) 35 (m)	**1**

Question	Answer	Marks
2(a)(i)	measure mass of empty measuring cylinder/beaker add measured/fixed volume of liquid measure mass of measuring cylinder/beaker and liquid determine mass of liquid (by subtracting mass empty from mass when full) use of D = M/V	**5**
2(a)(ii)	g / cm^3 **OR** kg / m^3	**1**
2(b)(i)	(polythene is) less dense (than water)	**1**
2(b)(ii)	W = m × g in any form **OR** (m =) W ÷ g **OR** 100 g weighs 1 N	**1**
	0.84 ÷ 10 **OR** 100 (g) × 0.84	**1**
	0.084 (kg) **OR** 84 g	**1**

Question	Answer	Marks
3(a)	43.0 + 2.4 = 45.4 (N)	**1**
	(74.2 – 45.4 =) 28.8 (N)	**1**
	upwards	**1**
3(b)		**1**

Question	Answer	Marks
4(a)	Any **four** from: specs/dots (of light) (smoke/air particles) moving (smoke/air particles) randomly (because fast moving) air molecules collide with smoke particles (producing)Brownian motion	**4**
4(b)	evaporate/evaporation	**1**
	high(er) energy/enough energy/fast(er) moving molecules OR molecules with great(er) KE	**1**
	escape (from the water surface)	**1**

Question	Answer	Marks
5(a)	Q S P R	**3**
5(b)	any **one** advantage from: continuous supply/steady supply or reverse argument any **one** disadvantage from: only available in certain areas/thin crust/near geysers or can damage water table OR limited lifespan/rocks can cool	**2**

Question	Answer	Marks
6(a)	(26 – 23 =) 3(°C)	**1**
6(b)	any **three** from: use metal pipe paint black or use black pipe use matt or dull (paint) (place) reflector behind pipe use long(er) pipe use pipe with great(er) surface area slow(er) flow rate (place) glass/(clear) plastic cover over pipe	**3**
6(c)	infra-red (radiation through space/air)	**1**
	conduction <u>through pipe</u>	**1**

Question	Answer	Marks
7(a)(i)	blue between indigo and green	**1**
	yellow between green and orange	**1**
7(a)(ii)	arrow pointing right ⟶	**1**
7(b)(i)	ray(s) refracted down at first boundary (air/glass)	**1**
	correct refraction for candidate's ray (in glass prism)	**1**
7(b)(ii)	refraction	**1**

Question	Answer	Marks
8(a)(i)	tape measure	**1**
8(a)(ii)	reflection (of sound)	**1**
8(b)	time for sound to travel to wall and back = 1.0 s	**1**
	340 m in 1.0 s	**1**
	(speed =) 340	**1**
	m / s	**1**

Question	Answer	Marks
9(a)(i)	X-rays between gamma rays and ultraviolet	**1**
	microwaves between infra-red and radio	**1**
9(a)(ii)	ring drawn around radio on Fig.9.1	**1**
9(b)	any **two** from: lead/metal apron (use long) tongs limit (time of) exposure point source away (from you) owtte	**2**

Question	Answer		Marks
10(a)	resistor identified		**1**
10(b)	quantity current NOT amps ignore ammeter	unit A/amps/amperes	**2**
	quantity potential difference or p.d. or emf	unit V/volts ignore voltmeter	**2**
10(c)	increasing (length) increases resistance owtte		**1**
	increasing (diameter) decreases resistance owtte		**1**

Question	Answer	Marks
11(a)(i)	cell and switch connected in series with any part of conductor (on Fig.11.1)	**1**
	correct symbols used – (on Fig.11.1)	**1**
11(a)(ii)	circular	**1**
	around conductor/wire	**1**
11(a)(iii)	no change/nothing	**1**
11(b)	conductor/wire between the poles of a magnet	**1**
	opposite poles facing each other	**1**
	current in wire	**1**
	wire moves/Flemings left hand rule indicated	**1**

Question	Answer	Marks
12(a)(i)	α or alpha	**1**
12(a)(ii)	α or alpha	**1**
12(b)(i)	beta or β	**1**
	beta emission would be affected by the thickness of the metal owtte	**1**
12(b)(ii)	(counter) reading higher	**1**
12(b)(iii)	rollers move apart/provide less force/pressure owtte	**1**
12(b)(iv)	38	**1**