Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/33**

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.

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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.

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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.

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Question	Answer	Marks
1(a)	2 : 33 : 65 – 1 : 22 : 15 **OR** 153.65 – 82.15	**1**
	71.50 (s)	**1**
1(b)	4 × 20 **OR** 4000 × 20	**1**
	(average speed =) distance ÷ time	**1**
	80 000 ÷ 1600	**1**
	50 (m / s)	**1**
1(c)(i)	(section) P or from 0 s to 2.5 s	**1**
	(line has) greatest gradient	**1**
1(c)(ii)	dist travelled = area under graph **OR** ½ × b × h	**1**
	½ × 2.5 × 40	**1**
	50 (m)	**1**

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Question	Answer	Marks
2(a)	W = m × g	**1**
	50 ÷ 1000 **OR** 0.05 seen	**1**
	0.5 (N)	**1**
2(b)	**any 4** from: fix ruler vertically add weight/hanger to spring fix pin (horizontally) to (top/bottom) of weight hanger pin arranged so near ruler scale ensure load stationary eye level with pin to take reading (of length) determine extension for given load repeat for different loads	**4**

Question	Answer	Marks
3(a)(i)	(D =) m ÷ v in any form	**1**
	120 ÷ 16.0	**1**
	7.50 (g / cm^3)	**1**
3(a)(ii)	10 (m / s^2)	**1**
3(b)(i)	(downward force) weight **AND** (upward force) air resistance/friction/drag	**1**
3(b)(ii)	(1.2 – 0.3 =) 0.9 (N)	**1**

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Question	Answer	Marks
4	moment = force × (perp.) distance (from pivot/bracket)	**1**
	25 × 90 or 25 × 0.9	**1**
	2250 or 22.5	**1**
	N cm or N m	**1**

Question	Answer	Marks
5(a)	P = F ÷ A **OR** (F =) P × A in any form	**1**
	20 000 × 0.009	**1**
	1800 (N)	**1**
5(b)	pressure increases	**1**
	any **two** from: molecules move faster/have more ke collide harder/more often (with walls of can) (change in momentum due to) collisions impart(s) force on can walls	**2**

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Question	Answer	Marks
6(a)(i)	80 – 56 OR 24(°C)	**1**
6(a)(ii)	20 – 18 or 2(°C)	**1**
6(b)	water hotter (at start)	**1**
	(so) greater temperature difference (between can and surroundings)	**1**
6(c)	(dull) black	**1**
	greater (rate of) loss of thermal energy (from dark colours) **OR** black or it is better radiator/emitter (of thermal energy)	**1**

Question	Answer	Marks
7(a)	(part **A**) radio	**1**
	(part **B**) visible/light	**1**
7(b)	transverse	**1**
7(c)(i)	IR/infra-red	**1**
7(c)(ii)	gamma **OR** γ **OR** X-rays **OR** ultraviolet	**1**

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Question	Answer	Marks
8(a)(i)	Longitudinal	**1**
8(a)(ii)	Amplitude	**1**
8(a)(iii)	pitch	**1**
8(b)	frequencies (of sound)	**1**
	above 20 000 Hz	**1**

Question	Answer	Marks
9(a)	Any **two** from: pole of magnet placed on/near steel rod magnet stroked along rod owtte repeat strokes same direction	**2**
9(b)	place pole of rod next to a known magnet	**1**
	like poles repel	**1**
9(c)	accept iron loses magnetism easily owtte or reverse argument	**1**

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Question	Answer	Marks
10(a)(i)	variable resistor	**1**
	change the current	**1**
10(a)(ii)	Any **three** from: use low value of current measure (and record) current measure (and record) voltage repeat other values (of I and V) plot graph of pd against current (and find gradient) OR use $V = I \times R$	**3**
10(b)(i)	$V = I \times R$ in any form **OR** $(I =) V \div R$	**1**
	240 ÷ 21.8	**1**
	11.0 (A)	**1**
10(b)(ii)	Answer in range 12 to 15 (A)	**1**

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Question	Answer	Marks
11(a)	Correctly-drawn magnetic field around coil	**1**
	lines to start and end near coil/tube	**1**
	field line arrows point towards left hand of coil	**1**
11(b)	electromagnet	**1**
11(c)	(when switch S_1 is closed there is a) current in the coil (of wire)	**1**
	(soft) iron (core) becomes magnetised/magnetic field created	**1**
	soft iron armature attracted (to core)	**1**
	contacts/A and B close/(motor) circuit completed/current in motor circuit	**1**

Question	Answer	Marks
12(a)	neutron	**1**
	electron	**1**
12(b)	upper row: 2 in both	**1**
	lower row: 1 in left box **AND** 3 in right box	**1**
12(c)(i)	weak(ly) penetrating	**1**
12(c)(ii)	Any **two** from: absorbed over a short distance large mass high charge highly ionising cause cell mutation/damage DNA (high risk) of developing cancer	**2**

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