Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/32**

Paper 3 Core Theory **March 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 March 2018 series for most Cambridge IGCSE®, Cambridge International A and AS Level 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)	5.0 ÷ 500 or 0.01 (cm)	**B1**
1(b)	30 × 20 × 5 or length × width × height or cross-sectional area × length	**B1**
1(c)	balance	**B1**
1(d)	D = M / V in any acceptable form	**C1**
	2400 ÷ 3000	**C1**
	0.80 (g / cm^3) or 0.8 (g / cm^3)	**A1**

Question	Answer	Marks
2(a)(i)	2nd box ticked section B	**B1**
2(a)(ii)	distance = area under graph or line or 0.5 × base × height	**C1**
	20 × 5 × 0.5	**C1**
	50 (m)	**A1**
2(b)(i)	(average speed =) (total) dist ÷ (total) time	**C1**
	(250 × 4)	**C1**
	1000 ÷ 80	**C1**
	12.5 (m / s)	**A1**
2(b)(ii)	43.88 – 20.16 or 23.72	**B1**

Question	Answer	Marks
3(a)	12.5 (mm)	**B1**
3(b)	(spring) B	**M1**
	same load gives greater extension (than spring A) owtte	**A1**
3(c)(i)	43.9 – 19.7 or 24.2 (cm)	**B1**
3(c)(ii)	Any **two** from: measure the extension for different (number of 1.0 N) loads repeat each reading (as each (1.0 N) load is removed) AND calculate average (extension for each load) (take reading from ruler with) eye level with pin	**B2**

Question	Answer	Marks
4(a)	any **three** from: water flows down (from reservoir) idea of gravitational / potential energy (transferred to kinetic (energy)) water turns turbine turbine turns generator	**B3**
4(b)	Any **three** from: • does not contribute to atmospheric pollution / acid rain • does not contribute to greenhouse gases / global warming • renewable energy source (so will not run out) • short start-up time / can meet surges in demand owtte • conserve non-renewable reserves / fossil fuels • reduces dependence on fossil fuels (from other countries)	**B3**
4(c)(i)	kinetic	**B1**
4(c)(ii)	efficient	**B1**

Question	Answer	Marks
5(a)(i)	(pressure) increases	**B1**
5(a)(ii)	any **four** from: (air) molecules / particles have more (kinetic) energy / move faster more frequent collisions harder collisions (with walls) collisions with walls idea of collisions causing force	**B4**
5(b)	P = F / A in any form words or numbers	**C1**
	0.59	**A1**
	N / cm^2	**B1**
5(c)(i)	(Area = $\pi \times r^2$ =) 50.2654 (cm^2)	**B1**
5(c)(ii)	smaller <u>area</u> (in contact with the table)	**B1**

Question	Answer	Marks
6(a)	expansion / voltage / potential difference / emf length / colour / pressure / volume / resistance / density	**B1**
6(b)(i)	8:30 pm	**B1**
6(b)(ii)	9:00 pm	**B1**
	(explanation) Slope / gradient of graph is less or temperature drops / falls (more) slowly / slower	**B1**
6(c)	insulator conduction convection	**B3**

Question	Answer	Marks
7(a)(i)	(angle) Z	**B1**
7(a)(ii)	any other part of em spectrum or (seismic) S-waves	**B1**
7(b)(i)	3 curved waves after gap	**M1**
	waves evenly spaced and centred on gap (by eye)	**A1**
7(b)(ii)	diffraction	**B1**

Question	Answer	Marks
8(a)(i)	ammeter in series with power supply	**B1**
8(a)(ii)	variable resistor symbol in series with lamp B	**B1**
8(a)(iii)	voltmeter symbol seen	**B1**
	voltmeter symbol in parallel with lamp B	**B1**
8(b)	V = I R in any form	**C1**
	6.0 ÷ 0.2 accept 6 ÷ 0.2	**C1**
	30 (Ω)	**A1**

Question	Answer	Marks
9(a)(i)	X-rays / X-radiation	**B1**
9(a)(ii)	Radio waves	**B1**
9(b)	ultrasound	**B1**
9(c)	For full marks the method described must work. any **four** from: Means of producing sharp sound use of suitable reflecting surface measure distance travelled by sound Method for measurement of time for sound to travel measured distance. use of speed = distance / time	**B4**

Question	Answer	Marks
10(a)	any **four** from: needle moves (one way) as N pole / magnet moves downward / into coil as coil cuts across magnetic field (of magnet) needle moves in opposite direction as N pole / magnet moves upward / out of coil field is cut in opposite direction needle at zero when spring at max extension magnet is stationary so no cutting of field lines	**B4**
10(b)	(device) X is a step-up transformer	**B1**
	(device) Y is a step-down transformer	**B1**

Question	Answer	Marks
11(a)	friction (between cloth and rod)	**B1**
	(causes) electrons to move	**B1**
	from cloth / to rod	**B1**
11(b)	rod {moves or rotates} away	**B1**
	like charges repel	**B1**

Question	Answer	Marks
12	For full marks the method described must work. any **four** from: take background reading / reading without source use piece of paper between source and detector beta particles can pass through paper or alpha particles stopped / absorbed by paper?) reading on detector similar / unchanged so no alpha particles emitted use few mm of aluminium between source and detector reading on detector now similar to background reading (because) beta particles stopped by a few mm of aluminium	**B4**