



PHYSICS

0625/32

Paper 3 Core Theory

May/June 2019

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.

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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)	A accelerating (uniformly) / speeding up	B1
	B steady/constant/uniform speed	B1
	C deceleration (non-uniform) / slowing down	B1
	D at rest / stopped/stationary / not moving	B1
1(b)	distance = area under graph OR area = $\frac{1}{2} \times \text{base} \times \text{height}$	C1
	$0.5 \times 3.5 \times 5$	C1
	8.75 (m)	A1

Question	Answer	Marks
2(a)	$(678 - 318 =) 360$ (g)	B1
2(b)(i)	160 (cm ³)	B1
2(b)(ii)	400 (cm ³)	B1
2(b)(iii)	D = m/v in any form	C1
	$360 \div 400$	C1
	0.9 (g/cm ³)	A1

Question	Answer	Marks
3(a)(i)	2.77 – 2.22 OR 0.55	B1
	1.1(0) (s)	B1
3(a)(ii)	any four from: (idea of) use of fiducial mark start watch as pendulum passes fiducial mark OR when pendulum released count large number (must be ≥ 10) of swings stop watch as pendulum passes marker OR starting point divide total time by the number of swings timing to centre of swing	B4
3(b)	1 0.4(J)	B1
	2 0 or zero or no (J)	B1

Question	Answer	Marks
4(a)(i)	expand or increase in size/volume increase in pressure decrease in density	B1
4(a)(ii)	any 3 from: density (of air) is less molecules move faster/have more (kinetic) energy more collisions (per second) collisions with surface OR balloon (owtte) more force (in collisions) molecules move (further) apart	B3

Question	Answer	Marks
4(b)	P = F/A in any form	C1
	30 ÷ 12	C1
	2.5	A1
	N/cm ²	B1

Question	Answer	Marks
5(a)	F then H	B1
	G then E	B1
5(b)(i)	1 100 (W)	B1
	2 500 (W)	B1
5 (b)(ii)	less power OR energy used (by LED)	B1
	less CO ₂ OR greenhouse gases OR global warming	B1

Question	Answer	Marks
6(a)(i)	normal	B1
6(a)(ii)	(angle of) incidence	B1
6(a)(iii)	double(s)	B1
6(b)(i)	principal focus	B1
6(b)(ii)	inverted diminished	B2

Question	Answer	Marks
7(a)	solid: molecules closely packed OR fixed positions OR can only vibrate	B1
	liquid: molecules loosely packed OR (more) random (arrangement)	B1
	gas: molecules widely spaced OR further apart than in liquid	B1
7(b)(i)	<u>evaporation</u>	B1
7(b)(ii)	Any 3 from: more energetic/faster molecules escape from the surface OR liquid (net/average) energy of remaining molecules is lower less (average) energy (gives) lower temperature molecules gain energy (from surroundings) speed of molecules increases	B3

Question	Answer	Marks
8(a)(i)	poles correctly labelled <div style="border: 1px solid black; width: 200px; height: 30px; margin: 0 auto; display: flex; justify-content: space-between; align-items: center;">S N</div>	B1
8 (a)(ii)	Any two from iron bar becomes induced magnet with S pole nearest to (N pole of) magnet opposite poles attract	B2
8(b)(i)	ends of coil connected to power supply OR battery OR cell	B1
8(b)(ii)	can be switched on/off OR magnetised/demagnetised (easily)	B1

Question	Answer	Marks
9(a)	(rule) rubbed with a cloth owtte	B1
	electrons or negative charges move	B1
	on to the cloth OR from / off the ruler	B1
9(b)(i)	positive	B1
9(b)(ii)	same charges repel	B1

Question	Answer	Marks
10(a)	ammeter symbol	B1
	ammeter in series (with power supply)	B1
	voltmeter symbol	B1
	voltmeter in parallel (with lamps/power supply)	B1
	two lamps in parallel	B1
10(b)	(brightness) stays the same	B1
	current (in working lamp) stays the same	B1

Question	Answer	Marks
11(a)	step-down (transformer)	B1
11(b)	(soft) iron	B1
	forms a temporary magnet	B1
11(c)(i)	$V_p/V_s = N_p/N_s$ OR ratio used	C1
	$240 \times (125 \div 5000)$	C1
	(PQ =) 6 (V)	A1
11(c)(ii)	(PR =) 12 (V) / double the value in (c)(i) (PQ)	B1
	twice as many turns between P and R (as P and Q)	B1

Question	Answer	Marks
12(a)(i)	unpredictable owtte	B1
12(b)	From top to bottom of table alpha: HIGH LOW	B1
	beta: MEDIUM MEDIUM	B1
	gamma: LOW HIGH	B1
12(c)	protons	B1
	neutrons	B1
	2 of each drawn/labelled AND no electrons	B1