



PHYSICAL SCIENCE

0652/32

Paper 3 Core Theory

October/November 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.

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This document consists of **9** printed pages.

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)(i)	0.6 (m ³) ;	1
1(a)(ii)	90 ; N ;	2
1(a)(iii)	($\rho =$) mass \div volume / 9 \div 0.6 ; 15 ;	2
1(b)(i)	7 (m / s) ;	1
1(b)(ii)	20 (s) ;	1

Question	Answer	Marks
2(a)	halogens ;	1
2(b)	any two from: <ul style="list-style-type: none"> • sodium • magnesium • aluminium ;; 	2
2(c)	silicon / phosphorus / sulfur ;	1
2(d)	argon / chlorine ;	1
2(e)(i), (ii)	<i>element</i> : sulfur ; <i>pollutant</i> : sulfur dioxide ;	2

Question	Answer	Marks
3(a)(i), (ii)	arrow showing amplitude ; arrow denoting wavelength ;	2
3(b)(i)	vibrations (of drill or road surface) ;	1
3(b)(ii)	20 ; 20 000 ; Hz ;	3
3(b)(iii)	nothing to vibrate or be compressed ;	1
3(c)(i)	(current is) reduced ; greater resistance (of lead) ;	2
3(c)(ii)	(electric) shock ;	1

Question	Answer	Marks
4(a)	HCl ; sodium chloride;	2
4(b)	Na ⁺ ; Cl ⁻ ;	2
4(c)	bonding pair between hydrogen and chlorine ; rest of molecule correct ;	2

Question	Answer	Marks
4(d)	(positive ions by) loss of electrons ; (negative ions by) gain of electrons ;	2

Question	Answer	Marks
5(a)(i)	switch ;	1
5(a)(ii)	switch ; two cells with consistent polarity ; all in series and circuit complete ;	3
5(b)(i)	refraction ; light slows down / changes speed (on entering lens) ;	2
5(b)(ii)	X = (principal) focus / focal point ; Y = focal length ;	2
5(c)	A = infra-red / IR ; B = visible (light) ;	2

Question	Answer	Marks
6(a)	gas syringe or measuring cylinder (if collected over water) ; no gaps in tubing ;	2
6(b)	2 2 1 ;	1

Question	Answer	Marks
6(c)	still present at end (of reaction) / OWTTE ;	1
6(d)	enzyme ;	1

Question	Answer	Marks
7(a)	any two from: <ul style="list-style-type: none"> • ductile • malleable • conduct electricity • conduct heat ;; 	2
7(b)(i)	copper sulfate ; water ;	2
7(b)(ii)	basic oxides react with acids ; mention of neutralisation ;	2

Question	Answer	Marks
8(a)	electrons ;	1
8(b)	electrons hit bottom half of screen ; path straight from plates to screen ;	2
8(c)(i), (ii)	moving (energy) / energy of movement / kinetic (energy) ; light (energy) ; thermal / heat (energy) ;	3

Question	Answer	Marks
9(a)	limestone ;	1
9(b)	neutralise OR (treat) acidic soil ;	1
9(c)	absorbs energy ;	1
9(d)	making bonds releases energy ; more (energy) released than taken in ;	2
9(e)	<i>any one from:</i> <ul style="list-style-type: none"> • concentration of carbon dioxide in atmosphere very low • (reaction taking place at) low temperature ; 	1

Question	Answer	Marks
10(a)(i), (ii)	one ; two ;	2
10(b)	(mass no) = 3 ; (proton no) = 2 ;	2
10(c)	becomes dimmer ; (almost) stops glowing / brightness halves every 10 years ;	2
10(d)	locked cabinet / shielding ;	1

Question	Answer	Marks
11(a)	double bond (between C = C) ;	1
11(b)	2 carbon atoms with single bond between ; rest of molecule correct ;	2
11(c)	poly(propene) ;	1
11(d)(i)	(compound of) carbon and hydrogen ; contains carbon and hydrogen only ;	2
11(d)(ii)	<i>name:</i> methane ; <i>formula:</i> CH ₄ ;	2