Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

COMBINED SCIENCE **5129/22**

Paper 2 Theory **October/November 2018**

MARK SCHEME

Maximum Mark: 100

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 October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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.

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)	106 ;	**1**
1(a)(ii)	53 ; 9 ; 2.65 ;	**3**
1(b)	limewater ; milky / chalky / white precipitate ;	**2**

Question	Answer	Marks
2(a)	<table><tr><td></td><td>aerobic</td><td>anaerobic</td></tr><tr><td>carbon dioxide</td><td>✓</td><td>×</td></tr><tr><td>water</td><td>✓</td><td>×</td></tr><tr><td>lactic acid</td><td>×</td><td>✓</td></tr><tr><td>energy</td><td>✓</td><td>×</td></tr></table>	**4**
2(b)	any **three** from • oxygen enters into lungs / alveoli • oxygen combines with haemoglobin • in red blood cells • which are carried by the blood / plasma • <u>diffuses</u> into muscles / cells ;;;	**3**

Question	Answer	Marks
3(a)	ammeter ; voltmeter ;	**2**
3(b)(i)	$R = V / I$; 42.5 ; Ω ;	**3**
3(b)(ii)	3.4 + 0.8 ; 4.2 ;	**2**

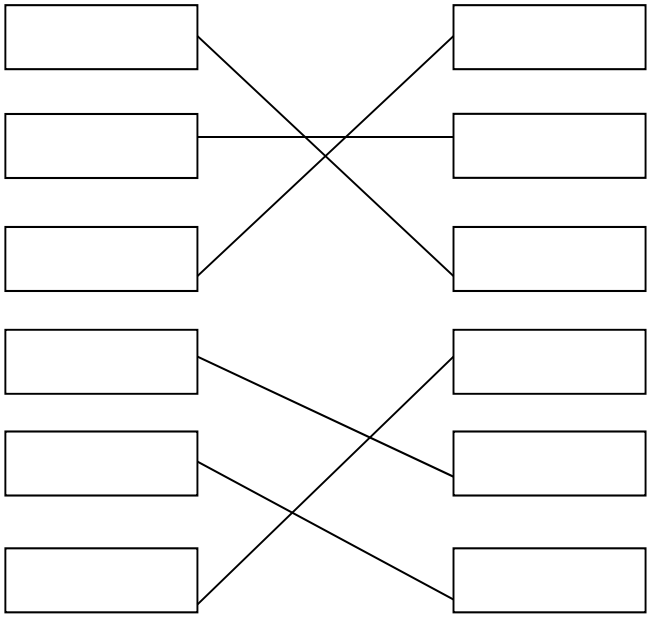
Question	Answer	Marks
4(a)	**A** = water ; **B** = zinc nitrate ; **C** = carbon dioxide ;	**3**
4(b)	burette ; neutral ; exothermic ;	**3**
4(c)	$Mg(NO_3)_2$;	**1**

Question	Answer	Marks
5(a)(i)	line drawn perpendicular to scale touching right edge of cell ;	1
5(a)(ii)	49 mm ;	1
5(a)(iii)	((2 × 49) ÷ 9 =) 11 ;	1
5(b)(i)	measure difference in volume of water ;	1
5(b)(ii)	$m = D \times V$; 13.9 ;	2

Question	Answer	Marks
6(a)	(light is a) source of energy ; traps / absorbs light ;	2
6(b)(i)	(rate of photosynthesis) increases as temperature increases ; any **one** from • energy of molecules increases • enzymes have an optimum temperature ;	2
6(b)(ii)	*prediction*: (rate of photosynthesis) decreases ; *reason*: any **one** from • enzymes denatured • 45 °C is above the optimum temperature for enzymes ;	2
6(c)	plants produce oxygen (needed by animals for respiration) ; plants produce food (eaten by animals) ;	2

Question	Answer	Marks
7(a)	bitumen ; kerosene ;	**2**
7(b)	compound / molecule containing carbon and hydrogen ; only ;	**2**
7(c)(i)	**X** = C_2H_4 ; **Y** = C_3H_6 ;	**2**
7(c)(ii)	alkenes ;	**1**

Question	Answer	Marks
8(a)	wire correctly labelled **L**.;	**1**
8(b)	carries current to earth (if there is a fault) ; stops appliance becoming live ;	**2**
8(c)	$P = V \times I$; 2208 ;	**2**

Question	Answer	Marks
9		**6**

Question	Answer	Marks
10(a)	B ;	**1**
10(b)	D ;	**1**
10(c)	B **and** D ;	**1**
10(d)	A **or** E ;	**1**
10(e)	C ;	**1**

Question	Answer	Marks
11(a)	continuous ray refracted through lens ; straight line through focal point (towards mirror) ; correct reflection on mirror ;	**3**
11(b)(i)	600 to 650 $\times 10^{-9}$ **or** 50 $\times 10^{-9}$ (m) ;	**1**
11(b)(ii)	3×10^{8} (m / s) ;	**1**
11(b)(iii)	selects 600×10^{-9} ; $f = v / \lambda$; 5×10^{14} (Hz) ;	**3**

Question	Answer	Marks
12	antibodies ; phagocytosis ; blood clotting ; plasma ; hormones ;	**5**

Question	Answer	Marks
13(a)	decrease ;	**1**
13(b)	react with water to form an alkali ;	**1**
13(c)(i)	$2K + Cl_2 \rightarrow KCl$;	**1**
13(c)(ii)	less reactive ;	**1**
13(c)(iii)	any **one** from • conduct electricity when molten • conduct electricity when in aqueous solution • soluble in water • less volatile • high melting / boiling point ;	**1**

Question	Answer	Marks
14(a)	<u>volume</u> ;	**1**
14(b)	x-axis labelled temperature and unit (°C or K) ; y-axis labelled height / position of pointer and unit (mm or cm or m) ; positive gradient from 0 on horizontal axis ;	**3**
14(c)	$W = F \times d$; 0.06 ; J **or** Joules **or** Nm ;	**3**

Question	Answer	Marks
15(a)(i)	12 ;	**1**
15(a)(ii)	10 ;	**1**
15(b)	any **two** from • more male **deaths** than female • female **deaths** increase up to 2008 • female **deaths** decrease from 2008 • male **deaths** increase up to 2006 • male **deaths** decrease from 2008 **;;**	**2**
15(c)	liver ;	**1**
15(d)	any **two** from • liver damage • brain **or** nerve damage • anaemia • higher risk of cancer • cardiovascular disease **or** heart disease • gastritis **or** stomach ulcers **or** stomach disorder • pancreatitis • dementia • depression **;;**	**2**

Question	Answer	Marks
16	elements ; molecule ; covalent ; alloy ;	**4**