Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

COMBINED SCIENCE **5129/21**

Paper 2 Theory **October/November 2019**

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 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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.

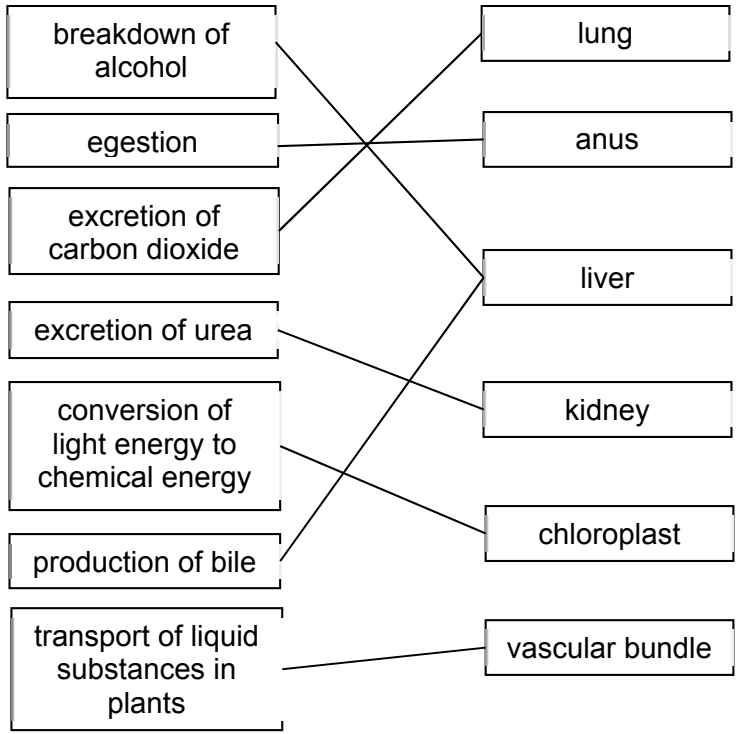
GENERIC MARKING PRINCIPLE 4:

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)	(mass moves down due to) gravity ; force in spring increases (as mass moves down) ; mass moves / pulled up due to force in spring ;	**3**
1(b)	(0.2 × 35 =) 7(N) ;	**1**
1(c)	it decreases ; more friction ;	**2**

Question	Answer	Marks
2(a)	M^{3+} ;	**1**
2(b)(i)	52 ;	**1**
2(b)(ii)	54 ; 2.7 ;	**2**
2(c)	evaporate solution (to smaller volume) ; allow to crystallize ;	**2**

Question	Answer	Marks
3		**6**

Question	Answer	Marks
4(a)(i)	size: gets longer ; shape: gets narrower / thinner ;	**2**
4(a)(ii)	goes back to original size and shape ;	**1**
4(b)	straight line of positive gradient from origin ; axes labelled – load and extension ;	**2**

Question	Answer	Marks
5(a)	**W** = hydrogen ; **X** = oxygen ; **Y** = water ; **Z** = ethane ;	**4**
5(b)	addition ; monomer ;	**2**
5(c)	speed up the reaction ;	**1**
5(d)	carbon to carbon double bond ;	**1**

Question	Answer	Marks
6	plasma ; antibodies ; platelets ; capillaries ;	**4**

Question	Answer	Marks
7(a)(i)	chlorophyll ;	**1**
7(a)(ii)	carbon dioxide ; water ;	**2**
7(a)(iii)	(nitrogen) needed to make amino acids ;	**1**
7(b)(i)	2.0 (tonnes per unit area) ;	**1**
7(b)(ii)	any **two** from • the more fertiliser added, the greater the crop yield ; • as more fertiliser is added the effect on yield decreases ; • there is a maximum yield at 200 kg ; • more than 200 kg causes a (slight) decrease in yield ;	**2**
7(b)(iii)	yield decreases (slightly) ;	**1**

Question	Answer	Marks
8(a)	(heated) water rises / goes up from A to B ; water becomes less dense when heated ;	**2**
8(b)	convection ;	**1**
8(c)	water is a poor conductor ;	**1**

Question	Answer	Marks
9(a)	–1 ; 1 ; 0 ;	**3**
9(b)(i)	A = 206 ; Z = 85 ;	**2**
9(b)(ii)	7 electrons in its outer shell ;	**1**

Question	Answer	Marks
10(a)	vibrations / oscillations ; transfer energy ;	**2**
10(b)(i)	3 ;	**1**
10(b)(ii)	(6 / 3 =) 2 (cm) ;	**1**
10(b)(iii)	v = f λ **or** f = v / λ **or** 40 / 2 ; 20 (Hz) ;	**2**

Question	Answer	Marks
11(a)(i)	rapid random movement ; particles far apart ;	**2**
11(a)(ii)	decreases ;	**1**
11(b)	less dense than air ;	**1**

Question	Answer	Marks
12	A ; C ; F ;	**3**

Question	Answer	Marks
13(a)	resistor and lamp in parallel ; switch in resistor branch only ; ammeter in lamp branch only ;	**3**
13(b)	Q = It **or** I = Q / t **or** 280 / 240 ; 1.2 ; A ;	**3**

Question	Answer	Marks
14(a)	any **three** from • proteins ; • fats ; • vitamins ; • fibre / roughage ;	**3**
14(b)	enzyme: amylase ; product: maltose / glucose ;	**2**
14(c)	peristalsis ;	**1**
14(d)(i)	X = ileum / small intestine ; Y = colon / large intestine ;	**2**
14(d)(ii)	22–24% ;	**1**
14(d)(iii)	any **two** from • acid conditions in stomach ; • stops amylase working ; • denatures amylase ; • pH below optimum for amylase ;	**2**
14(d)(iv)	all starch has been digested ;	**1**

Question	Answer	Marks
15(a)(i)	same charge ;	**1**
15(a)(ii)	stops flow of charge (from cap to casing) ;	**1**
15(b)(i)	3 (mm) ;	**1**
15(b)(ii)	(9 / 3) = 3 ; (20 / 60) = 0.33 ;	**2**
15(b)(iii)	inversely proportional ;	**1**

Question	Answer	Marks
16	aluminium ; zinc ; potassium ; lithium ; aluminium ;	**5**

Question	Answer	Marks
17(a)(i)	molecule containing two atoms ;	**1**
17(a)(ii)	covalent ;	**1**
17(b)	glowing splint ; relights ;	**2**
17(c)	2 5 4 2 ;	**1**