Cambridge
O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

COMBINED SCIENCE **5129/22**

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.

Cambridge Assessment International Education

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**:

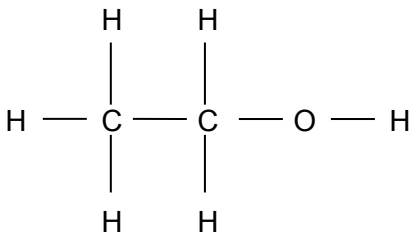
- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can 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.

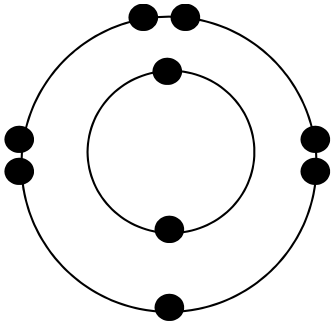
GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely 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)	(at t = 0) force in B greater than force in A **or** B pulls (to the right) ; (at t = 0.2) force in A increases **or** A pulls (back) **or** force in B decreases ; (at t = 0.25); force in A = force in B / balanced forces ;	**3**
1(b)(i)	lower acceleration ; any **one** from • more mass ; • more friction/air resistance ;	**2**
1(b)(ii)	F = ma **or** m = F / a **or** 27 / 15 ; 1.8 (kg) ;	**2**

Question	Answer	Marks
2(a)(i)	Q = condenser ;	**1**
2(a)(ii)	to completely fill Q with cold water ;	**1**
2(a)(iii)	B ;	**1**
2(b)	solvent ;	**1**
2(c)		**1**

Question	Answer	Marks
3	large ; ions ; xylem ; transpiration ; wilt ;	**5**

Question	Answer	Marks
4(a)	measure the (initial) length ; increase / add the mass ; calculate / measure / observe the new length ;	**3**
4(b)	it returns to its initial length ;	**1**

Question	Answer	Marks
5(a)(i)	nucleon ; proton ;	**1**
5(a)(ii)		**1**
5(a)(iii)	any **two** from • seven electrons in outer shell ; • in Group VII ; • on right of Periodic Table ; • gains one electron to form an ion **or** gains one electron to complete its outer shell ;	**2**
5(b)(i)	magnesium fluoride ;	**1**
5(b)(ii)	ionic ;	**1**

Question	Answer	Marks
6(a)	energy is transferred from baboon to leopard **or** the direction of energy transfer ;	**1**
6(b)	herbivore = 3 ; carnivores = 4 ;	**2**
6(c)	*increase:* fewer leopards as no baboons / less food to eat ; no scorpions eaten / more scorpions so more locusts eaten / fewer locusts so more grass for impala ; *decrease:* leopards eat **more** / **only** eat impala / eat impala instead of baboon ;	**2**
6(d)	(in chain B) **more** energy (is available) **or less** energy is lost **or** energy is lost at / between each level / stage ; (due to) movement / respiration / defecation / excretion / growth / heat ;	**2**

Question	Answer	Marks
7(a)	any **two** from • air at A is heated **or** air becomes hot ; • (heated air) becomes / is less dense **or** volume increases ; • hot air rises ;	**2**
7(b)	any **two** from • black absorbs / is an absorber ; • air gets hotter **or** heats faster ; • air moves faster / has more kinetic energy (through the generator) **or** more air rises ;	**2**
7(c)	<u>convection</u> ;	**1**

Question	Answer	Marks
8(a)	M^{3+} ;	**1**
8(b)(i)	27 ;	**1**
8(b)(ii)	108 ; 0.54 ;	**2**
8(c)(i)	any value in the range from 0 to 3 ;	**1**
8(c)(ii)	neutralisation ;	**1**

Question	Answer	Marks
9(a)	transverse ; oscillation / vibration is perpendicular to the wave (direction) ;	**2**
9(b)(i)	3 ;	**1**
9(b)(ii)	5 (cm) ;	**1**
9(c)	$v = f\lambda$ **or** 0.80×5.0 ; 4 (cm / s) ;	**2**

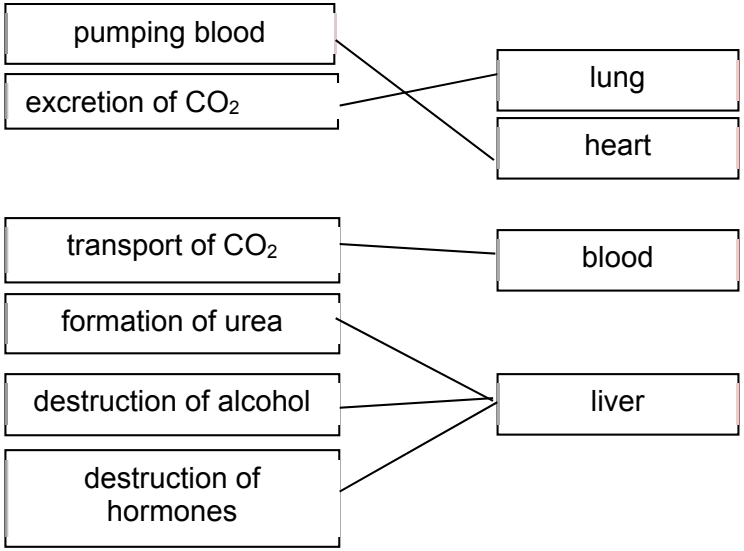
Question	Answer	Marks
10(a)	artery has thick**er** / **more** muscular, wall (than vein) ; artery has narrow**er** lumen (than vein) ; artery does not have semi-lunar valves ;	**3**
10(b)	any **two** from • smoking ; • stress ; • diet high in fats / cholesterol ; • lack of exercise ; • genetic disposition ; • being over-weight ; • age ;	**2**
10(c)	*adaptation* : thin wall / wall one cell thick ; *explanation* : any **one** from • short diffusion distance ; • more rapid diffusion **or** high rate of diffusion ; • large surface area (per volume) ;	**2**

Question	Answer	Marks
11(a)	iron ;	**1**
11(b)	nitric acid ;	**1**
11(c)	3 2 ;	**1**
11(d)(i)	different boiling point ;	**1**
11(d)(ii)	hydrocarbons ;	**1**
11(e)	nitrogen ;	**1**

Question	Answer	Marks
12(a)	**B** ; **C** ;	**2**
12(b)	any **two** from • water ; • oxygen ; • **suitable** temperature ;	**2**
12(c)	amylase ; maltose / glucose ;	**2**
12(d)	any **two** from • by animals ; • by insects ; • by wind ; • by water ;	**2**

Question	Answer	Marks
13(a)	resistor in series with lamp ; voltmeter parallel to lamp only ; ammeter to measure the current of the whole circuit ;	**3**
13(b)	Q = It **or** 0.65 × 200 ; 130 ; C / coulombs ;	**3**

Question	Answer	Marks
14	atom ; compound ; different ; low ; conducts ;	**5**

Question	Answer	Marks
15		**6**

Question	Answer	Marks
16(a)	compound / substance containing carbon and hydrogen ; only ;	**2**
16(b)	(test) add bromine (water) ; (result – bromine / it) decolourises ;	**2**
16(c)	increases ;	**1**

Question	Answer	Marks
17(a)	**X** and **Y** have opposite / unlike charges ;	**1**
17(b)(i)	19.0 ;	**1**
17(b)(ii)	as distance increases, time increases ; time increases by a larger amount for each 2 cm increase ;	**2**
17(b)(iii)	force (of attraction) ; (attraction is) greater when they are closer ;	**2**