
SCIENCE

1113/02

Paper 2

April 2017

MARK SCHEME

Maximum Mark: 50

IMPORTANT NOTICE

Mark Schemes have been issued on the basis of **one** copy per Assistant examiner and two copies per Team Leader.

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 Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

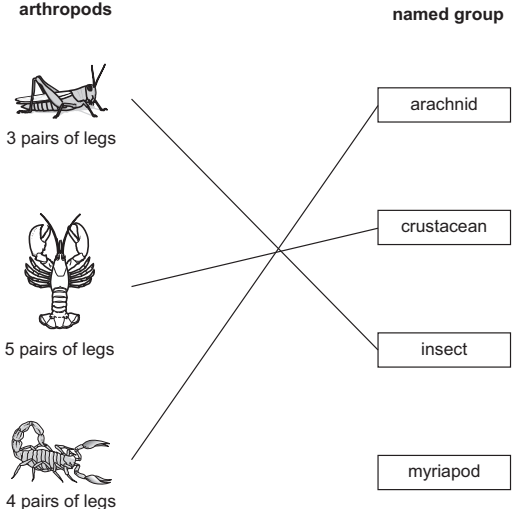
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

This document consists of **12** printed pages.

Question	Answer	Marks	Further Information
1	An iron nail is attracted to both the south pole and the north pole of a magnet.	1	Accept other indications of the correct answer e.g. ticking or circling but answer line takes precedence

Question	Answer	Marks	Further Information
2	<p>A high pitched sound is always loud. <input type="checkbox"/></p> <p>A high pitched sound always has a high frequency. <input checked="" type="checkbox"/></p> <p>A high pitched sound always has a large amplitude. <input type="checkbox"/></p> <p>A high pitched sound always has a low frequency. <input type="checkbox"/></p> <p>A high pitched sound must have a large wavelength. <input type="checkbox"/></p>	1	more than one answer ticked = 0 marks

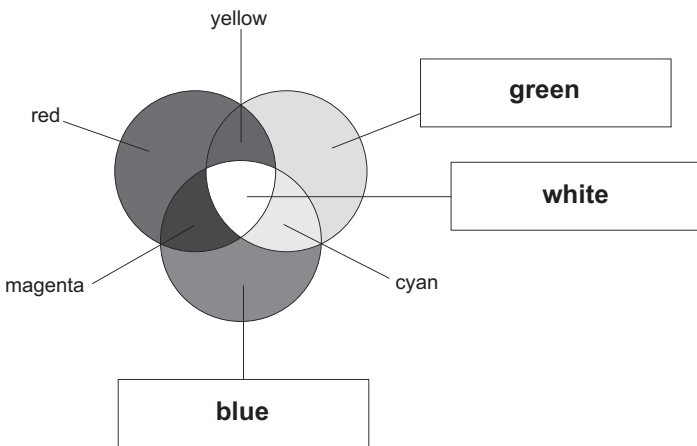
Question	Answer	Marks	Further Information
3(a)	<p>arthropods</p>  <p>named group</p> <p>3 pairs of legs</p> <p>5 pairs of legs</p> <p>4 pairs of legs</p> <p>arachnid</p> <p>crustacean</p> <p>insect</p> <p>myriapod</p>	3	<p>if more than one line from any animal = 0 marks</p> <p>each correct link = 1 mark</p>
3(b)	<p>any two from</p> <p>all have an exoskeleton</p> <p>do not have a backbone / are invertebrates</p> <p>all have segmented bodies / bodies in sections</p>	2	<p>Ignore have a shell</p> <p>Accept bilateral symmetry</p>

Question	Answer	Marks	Further Information
4(a)(i)	Al and Cl ₂	1	Accept aluminium and chlorine Ignore the chemical symbol Cl
4(a)(ii)	CO ₂ and MgCO ₃	1	Accept carbon dioxide and magnesium carbonate
4(a)(iii)	KNO ₃ and MgCO ₃	1	Accept potassium nitrate and magnesium carbonate
4(a)(iv)	KNO ₃	1	Accept potassium nitrate
4(b)	calcium oxide	1	

Question	Answer	Marks	Further Information
5(a)	120 J of thermal energy	1	
5(b)	100 J of electrical energy	1	

Question	Answer	Marks	Further Information
6(a)	biomass	1	Accept other indications of the correct answer e.g. underlining and ticking but circling takes precedence more than one answer circled = 0 marks
6(b)(i)	any three from global warming (enhanced) greenhouse effect climate change floods /drought crop failure / famine desertification sea level rise melting ice caps	3	Ignore acid rain Do not accept ozone depletion and the consequences of ozone depletion e.g. skin cancer. if ozone depletion mentioned and two others correct max = 2 marks 'pollution' unqualified = 0 marks Ignore carbon dioxide is poisonous Ignore animals killed / habitats destroyed unless qualified e.g. coral reef destruction
6(b)(ii)	wood (no mark) can be grown again / (idea of) recycles carbon / no increase in atmospheric CO ₂ levels / (idea that) it is renewable or hydrogen (no mark) burns to form water / does not produce CO ₂ / renewable	1	the mark is for the explanation

Question	Answer	Marks	Further Information
7(a)	<p>As the atomic mass increases the melting point increases.</p> <p>or</p> <p>As the atomic mass decreases the melting point decreases.</p>	1	<p>The sentences must be comparative</p> <p>Accept gets bigger / gets larger instead of increase</p> <p>Accept atomic mass gets heavier for increase</p> <p>Accept gets smaller instead of decrease</p> <p>Accept atomic mass gets lighter for decrease</p>
7(b)	gas	1	
7(c)	-34 (°C)	1	Accept other indications of correct answer e.g. circling or underlining but answer line takes precedence

Question	Answer	Marks	Further Information
8		2	all three correct = 2 marks one or two correct = 1 mark

Question	Answer	Marks	Further Information
9	the Sun	1	Accept star

Question	Answer	Marks	Further Information
10(a)(i)	type (amount of) fertiliser used	1	Accept treatment
10(a)(ii)	any two from number of seeds / number of plants amount of fertiliser time temperature lighting / sunlight the soil	2	Ignore number of peppers Accept volume of fertilizer / amount of treatment / volume of treatment / concentration of fertiliser Accept kept in the same greenhouse Accept variety of peppers Accept have plants same distance apart Ignore amount of water
10(a)(iii)	as a control / as a comparison	1	Accept to see the effect of fertiliser
10(b)(i)	(idea that) fertiliser makes them grow taller (artificial fertiliser is best)	1	answer must be comparative
10(b)(ii)	(idea that fertilizer) increases (number of peppers)	1	answer must be comparative Accept doubles / trebles yield / more peppers with fertilizer Accept most with artificial fertiliser / least with water

Question	Answer			Marks	Further Information
11	metal	water	acid	5	<p>Accept lots of bubbles and forms hydrogen / flames and forms hydrogen / quick reaction and forms hydrogen</p> <p>Accept violent reaction to form hydrogen / lots of bubbles and forms hydrogen / quick reaction and forms hydrogen</p> <p>Accept reaction to form hydrogen</p>
	sodium	violent reaction to form hydrogen (1)	violent reaction to form hydrogen		
	calcium	bubbles and gives hydrogen	rapid bubbles to form hydrogen (1)		
	iron	no reaction	a slow formation of hydrogen bubbles (1)		
	copper	no reaction (1)	no reaction		
	gold	no reaction	no reaction (1)		

Question	Answer	Marks	Further Information
12	(book) B (no mark) (idea of) small(est) area (in contact with table)	1	Accept smaller area gives a larger pressure Accept ora if A specified

Question	Answer	Marks	Further Information
13	any three from Mike's moment and Oliver's moment are equal (must be stated) (idea that) Mike is half the weight of Oliver / Oliver is twice the weight of Mike (idea that) Mike is twice as far from the pivot than Oliver / Oliver is half the distance from the pivot compared to Mike Mike's moment is 500×2 or 1000 (Nm) Oliver's moment is 1000×1 or 1000 (Nm)	3	Accept force for weight Do not award this marking point if mass is used instead of weight Ignore units Do not accept force is 1000 Accept $500 \times 2 = 1000 \times 1$ for all three marks

Question	Answer	Marks	Further Information
14(a)	decrease	1	Accept it will get colder Accept quoted temperature values less than 20 °C
14(b)	carbon dioxide / CO ₂ water / H ₂ O	2	if both name and formulae are given both must be correct if both products are correct but reversed = 1 mark

Question	Answer	Marks	Further Information
15(a)	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin-bottom: 10px;">air particles</div> heat particles light particles solid particles sound particles	1	Accept other indications of correct answer but circle takes precedence more than one answer circled = 0 marks
15(b)	Area A is called a compression because the particles are close together . Area B is called a rarefaction because the particles are far apart .	2	Accept any (idea that) the particles are close Ignore particles are compressed together Accept any (idea that) the particles are apart

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Question	Answer	Marks	Further Information
16	<p>The particles have less energy. <input type="checkbox"/></p> <p>The particles move closer together. <input type="checkbox"/></p> <p>The particles move slower. <input type="checkbox"/></p> <p>The particles spread out. <input checked="" type="checkbox"/></p>	1	more than one tick = 0 marks

Question	Answer	Marks	Further Information
17(a)	<p>Planet A Mercury</p> <p>Planet B Venus</p>	1	both correct = 1 mark
17(b)	F	1	Ignore name
17(c)	3 4 5 6 7	1	<p>Accept other indications of correct answer but circle takes precedence</p> <p>more than one answer circled = 0 marks</p>