



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/33

Paper 3 Core Theory

October/November 2017

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.

Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is a registered trademark.

This document consists of **10** printed pages.

Question	Answer	Marks
1(a)	xylem ; mesophyll cells ; stomata ;	3
1(b)	any two from photosynthesis ; transport of ions ; support / turgor ; AVP ;	max 2
1(c)	ions / named ion ; soluble nutrients / named soluble nutrient ; hormones / named hormone ; carbon dioxide ; AVP ;	max 2
1(d)(i)	transport of oxygen ;	1
1(d)(ii)	to replace iron lost during menstruation / period ;	1
1(d)(iii)	feeling tired / dizzy ;	1

Question	Answer	Marks
2(a)(i)	Any two from electrical conductor ; thermal / heat conductor ; malleable ; ductile ; sonorous ;	max 2
2(a)(ii)	high density / high melting point / coloured compounds ;	1
2(b)(i)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">(iron)</div> <div style="margin: 0 10px;">+</div> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">sulfuric acid</div> <div style="margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">iron sulfate</div> <div style="margin: 0 10px;">+</div> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">hydrogen</div> </div> ;	1
2(b)(ii)	(anion) chloride ; (acid) hydrochloric (acid) ;	2
2(c)	number of protons in an atom / nucleus ;	1

Question	Answer	Marks							
3(a)	(Q =) friction / (water) resistance ; (R =) gravitational force / weight ;	2							
3(b)	(forces P and R) equal / balanced ;	1							
3(c)(i)	P / uplift ;	1							
3(c)(ii)	<table border="1"> <tr> <td>gamma</td> <td></td> <td></td> <td>visible light</td> <td></td> <td>micro- waves</td> <td>radio waves ;</td> </tr> </table>	gamma			visible light		micro- waves	radio waves ;	1
gamma			visible light		micro- waves	radio waves ;			
3(c)(iii)	sound ;	1							
3(d)	nuclear / batteries ;	1							
3(e)	either $30 \text{ km} = 30\,000 \text{ m}$ or $1 \text{ hour} = 3600 \text{ s}$; $(30\,000 / 3600) = 8.3 \text{ m/s}$;	2							

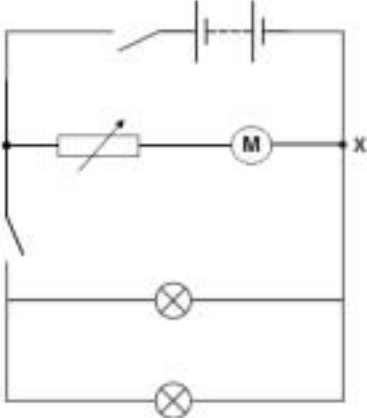
Question	Answer	Marks
4(a)	A oesophagus ; B colon / large intestine ;	2
4(b)(i)	stomach ; any two from stomach has acidic conditions ; pH 2 is acidic ; enzyme only worked in tube 1 / tube 1 was acidic / at the optimum pH ;	max 3
4(b)(ii)	enzyme will become inactive / destroyed at this temperature ;	1
4(b)(iii)	large / protein molecules are broken down ; by the action of an enzyme / acid ;	2
4(b)(iv)	chewing food (in mouth) ;	1

Question	Answer	Marks
5(a)(i)	distillation ;	1
5(a)(ii)	decrease ;	1
5(b)	(filtration) remove (named) solids ; (chlorination) kill microbes / bacteria / sterilizes ;	2
5(c)(i)	(refinery gas) bottled gas / heating / cooking ; (gas oil) diesel fuel / diesel engines / diesel vehicles ;	2
5(c)(ii)	compound / molecule containing hydrogen and carbon ; only (C and H);	2
5(d)(i)	A F ;	1
5(d)(ii)	B ;	1

Question	Answer	Marks
6(a)	temperature at which a solid changes to a liquid <i>owtte</i>	1
6(b)(i)	conduction and convection ;	1
6(b)(ii)	(reduces convection) as no (gas) circulation (possible) <i>owtte</i> ; (reduces conduction) as foam is a bad conductor <i>owtte</i> ;	2
6(c)	infra-red	1
6(d)	$d = m/V = (1900/2000)$; $= 0.95 \text{ (g/cm}^3\text{)}$;	2

Question	Answer	Marks
7(a)	transpiration ;	1
7(b)(i)	<u>carbon dioxide</u> from the air ; is used in photosynthesis / reacts with water ;	2
7(b)(ii)	by respiration ; carbon dioxide released ;	2
7(c)	<i>rainfall reduced (no mark)</i> less water being transpired / evaporated from trees ;	1
7(d)	soil easily eroded ; due to lack of tree roots ;	2

Question	Answer	Marks
8(a)(i)	(left) cathode ; (right) anode ;	2
8(a)(ii)	orange / brown gas ;	1
8(b)	(reduced) oxygen is removed ;	1
8(c)	K Ca Mg Cu ; ;	2
8(d)(i)	any two from heat / increase temperature ; increase surface area of magnesium ; increase concentration of acid ; use / add a catalyst ;	2
8(d)(ii)	magnesium chloride ;	1
8(d)(iii)	filter / filtration ;	1

Question	Answer	Marks
9(a)	<div style="text-align: center;">  </div> <p>motor in parallel with headlamps ;</p> <p>variable resistor in motor branch, correct symbol ;</p> <p>switch for headlamps after motor branch, before first headlamp branch ;</p> <p>all wires required for complete circuit ;</p>	4
9(b)	(decreasing resistance) increases current (so faster motor) ;	1
9(c)	<p>in parallel ;</p> <p>the same as ;</p> <p>less than ;</p>	3
9(d)	<p>rain / water / damaged insulation / AVP ;</p> <p>protect from rain or water / use of protective cover / sensible suggestion related to hazard identified ;</p>	2