Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/32**

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.

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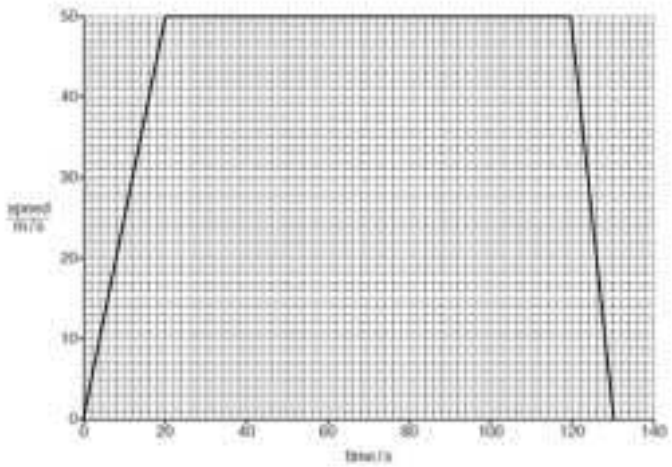
Question	Answer	Marks
1(a)	blood ; ovary ; 14 ; fertilised ;	**4**
1(b)	sperm cell / egg cell ; zygote / body cell ;	**2**
1(c)	genetic material is identical / clones ; because it has come from same egg and sperm / zygote ;	**2**

Question	Answer	Marks
2(a)(i)	(metal **A**) calcium / Ca (metal **B**) magnesium / Mg (metal **C**) zinc / Zn (metal **D**) iron / Fe ;;	**2**
2(a)(ii)	hydrogen ;	**1**
2(a)(iii)	increases (rate) ;	**1**
2(a)(iv)	any one from change / increase / decrease concentration / surface area / (solid) particle size ; use / add a catalyst ;	**max 1**
2(b)	(iron(II) ions) green ppt / solid ; (iron(III) ions) brown ppt / solid ;	**2**
2(c)(i)	Any two from high_density ; high_melting point ; (form) coloured compounds ; catalysts ;	**2**

Question	Answer	Marks
2(c)(ii)	(alloys are) harder / more resistant to wear / more resistant to corrosion ;	**1**

Question	Answer	Marks
3(a)	force arrow vertically upward labelled 'uplift' **;** force arrow vertically downward labelled 'weight' or 'gravitational force' ; (the two vertical) arrows in contact with helicopter / of equal length ;	**3**
3(b)	chemical ; kinetic ; gravitational / potential ;	**3**
3(c)(i)	one section of plot correct ; all 3 sections of the plot correct ; 	**2**
3(c)(ii)	distance = speed · time (= 50 · 100) ; = 5000 (m) ;	**2**

Question	Answer	Marks
4(a)	iodine ; goes (from brown) to blue-black ;	**2**
4(b)	Any three from results show starch present (around **A** and / or **B**) ; inactive / denatured enzyme ; because **A** is boiled ; because **B** is acidic / pH3 ;	**max 3**
4(c)	Any two from breaks down large / insoluble molecules ; into small / soluble molecules ; so that they can be absorbed ;	**max 2**
4(d)	molar ; flat / has cusps / large surface area ; for grinding food into smaller pieces ;	**3**

Question	Answer	Marks
5(a)	number of protons <u>in</u> an atom / nucleus ;	**1**
5(b)(i)	C ; A ;	**2**
5(b)(ii)	ionic / electrovalent ;	**1**
5(b)(iii)	releases heat / thermal energy / temperature goes up / gets hotter ;	**1**
5(c)(i)	(pale) green ;	**1**
5(c)(ii)	bromine / Br_2 ;	**1**
5(d)(i)	electrolysis ;	**1**

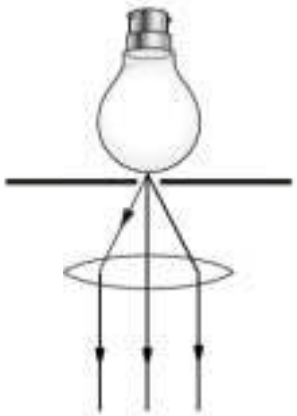
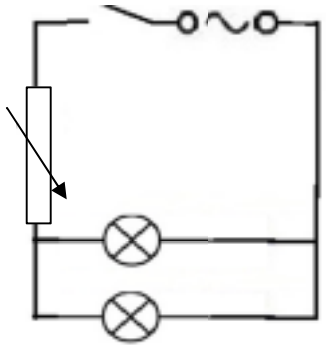
Question	Answer	Marks
5(d)(ii)	add water / use (copper chloride) solution ;	**1**

Question	Answer	Marks
6(a)(i)	conduction ;	**1**
6(a)(ii)	metal / named metal ;	**1**
6(b)(i)	arrows up and across room ; arrows down and back towards radiator ;	**2**
6(b)(ii)	convection ;	**1**
6(c)(i)	X-rays ;	**1**
6(c)(ii)	tick under radio waves ;	**1**
6(d)	description of charging by friction ; reference to positive and negative charges / opposite charges attract ; some experimental detail ;	**3**

Question	Answer	Marks
7(a)(i)	lower surface when upper leaf is greased water loss is not reduced by much ; when lower surface is covered there is a great reduction in water loss ;	**2**
7(a)(ii)	most transpiration occurs through the stomata ; which are (mostly) found on lower surface of leaf ;	**2**
7(b)	xylem ; position of tissue correctly labelled ;	**2**
7(c)	carbon dioxide, sugar / glucose, oxygen ;	**1**

Question	Answer	Marks
7(d)	Any two from carnivores cannot produce their own food / cannot photosynthesise ; carnivores get energy by eating herbivores ; herbivores feed on producers ;	**max 2**

Question	Answer	Marks
8(a)(i)	(copper oxide) + carbon → copper + carbon dioxide ;	**1**
8(a)(ii)	respiration / (reaction of) acid + carbonate / thermal_decomposition / fermentation ;	**1**
8(a)(iii)	(solid) coal ; (liquid) petroleum ;	**2**
8(b)(i)	ethanol ;	**1**
8(b)(ii)	compound / molecule containing / of only carbon and hydrogen ;	**1**
8(b)(iii)	(because it) contains oxygen / O (as well as C and H) ;	**1**

Question	Answer	Marks
9(a)(i)	two more rays from hole to lens ; all rays emerge from lens parallel ; 	**2**
9(a)(ii)	focal length ;	**1**
9(b)(i)	correct symbol for variable resistor ; 	**1**
9(b)(ii)	less than 20 A ; current from source is larger than in each branch ;	**2**
9(b)(iii)	remains lit (no mark) still a complete circuit through that branch *owtte* ;	**1**