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COMBINED SCIENCE

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Paper 3 Core Theory

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MARK SCHEME

Maximum Mark: 80

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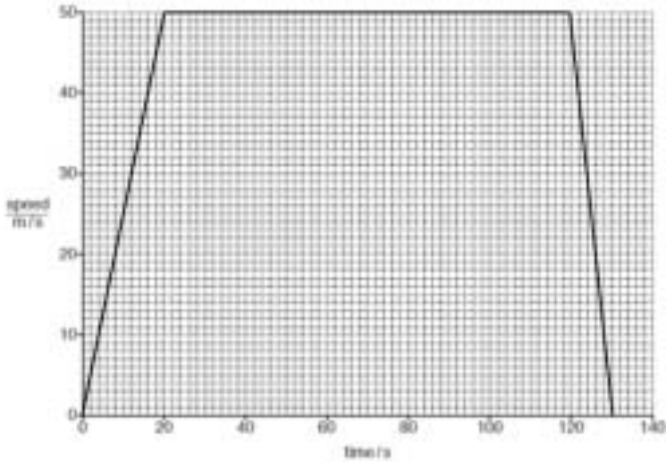
This document consists of **7** printed pages.



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 \times time (= 50 \times 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

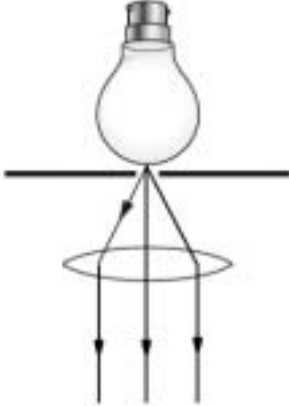
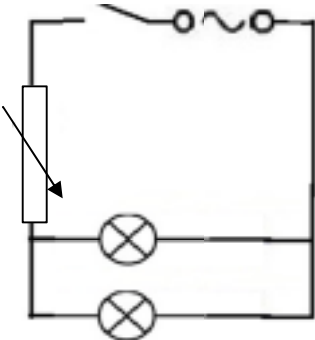
Question	Answer	Marks
5(d)(ii)	add water / use (copper chloride) solution ;	1

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)	<u>xylem</u> ; 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)	<div style="display: flex; align-items: center; gap: 10px;"> <div style="border: 1px solid black; padding: 5px;">(copper oxide)</div> + <div style="border: 1px solid black; padding: 5px;">carbon</div> → <div style="border: 1px solid black; padding: 5px;">copper</div> + <div style="border: 1px solid black; padding: 5px;">carbon dioxide</div> ; </div>	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)	<p>two more rays from hole to lens ; all rays emerge from lens parallel ;</p> 	2
9(a)(ii)	focal length ;	1
9(b)(i)	<p>correct symbol for variable resistor ;</p> 	1
9(b)(ii)	<p>less than 20 A ; current from source is larger than in each branch ;</p>	2
9(b)(iii)	<p>remains lit (no mark) still a complete circuit through that branch <i>owtte</i> ;</p>	1