

JUNE 2002

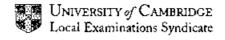
INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0653/3

COMBINED SCIENCE (EXTENDED)



Page 1	Mark Scheme	Syllabus	Paper
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1a	<pre>(yes - no mark for that) voltage is proportional to current / V = IR; straight line;</pre>		
	through origin;		max 2
ь	1.8 A; idea of proportionality;		2
С	voltmeter in the circuit with correct symbol; voltmeter in suitable position (parallel); ammeter in the circuit with correct symbol; ammeter in series;		
	method of varying voltage described;		4 ma x
2(a)	(inside) red blood cells;		1
(b)(i)	aa;		1
(ii)	phenotypes of parents normal genotypes of parents Aa gametes A and a offspring AA Aa Aa aa	normal; Aa; A and a;	4
(c)	less oxygen to, cells / tissues / muscles; correct reference to respiration; so less energy available;		3
(d))	iron;		1
3a	2 fractional distillation 3 cracking 4 polymerisation		
	3 in correct sequence for two marks;; 1 correct and 2 swapped round for one mark;		2

Page 2	Mark Scheme	Syllabus	Paper
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b(i) B;

(ii) C;

c polyethene / polythene ;
ethene molecules join together ;

to form, larger molecules / long chain;

correct use of the terms monomer and polymer; 3 max

d $(12 \times 4) + (1 \times 10)$; 58; not g

4 water molecules gain, movement / kinetic energy;

molecules spread out;

so the water, expands / takes up more space / moves up the tube;

flask expands;

as molecules vibrate, more; 4 max

- 5a speed = distance \div time; $(200 \times 10^6) \div (25 \times 10^2) = 80000 \text{ km per hour};$
- b(i) $3 \times 10^8 \text{ m/s} / 3 \times 10^5 \text{ km/s}$;
- (ii) time = distance ÷ speed $or (200 \times 10^9) \div (3 \times 10^8)$; = 667 s;
- c 60 kg / the same; mass is not affected by gravity;

Page 3	Mark Scheme	Syllabus	Paper
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6a	Fe_2O_3 ; need for charges to balance;	2
b (i)	iron oxide + carbon monoxide → iron + carbon dioxide;	1
(ii)	carbon monoxide; oxygen has been added;	2
c (i)	aluminium ions are positive so are attracted to, negative electrode / cathode; aluminium ions gain electrons; at / from, the cathode; gain three electrons;	3 ma x
d	aluminium, too reactive I more reactive than carbon;	1
7(a)(i)	sweat secreted / sweat onto surface of skin;	1
(ii)	water evaporates; takes heat (from skin) / latent heat described;	2
(b)(i)	dilate / vasodilation; not move	ì
(ii)	more blood near surface of skin; heat lost by <u>radiation</u> ;	2
(c)	rate of reactions / metabolism, affected by temperature; enzymes; denatured / damaged, if temperature too high;	2max
8a	(no - no mark for that) centre of mass is not beyond cliff edge; correct reference to, moments / turning forces;	2
b(i)	work = force x distance; $7500 \times 50 = 375000 \text{ J}$;	2
(ii)	power = work ÷ time; 375 000 ÷ 120; 3125 W;	3

Page 4	Mark Scheme	Syllabus	Paper
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9a(i)	acid and alkali selected; correct products on right hand side;;	3
(ii)	H ⁺ ;	1
(iii)	acid added to the alkali; carefully / slowly / in stages; use indicator / pH meter, to detect, end point / end point; correct definition of end point e.g. colour of named indicator;	3 max
(i v)	heat (the mixture) / evaporate the water / leave until water evaporates;	1
(b)	OH_;_	
10 (a)	to stop it photosynthesising : destarch it / so no starch present at start of experiment; so she knew any starch present had been made during the experiment;	2max
(b)(i)	to kill the cells / destroy the cell membranes / remove the wax layer / make it permeable (to iodine);	1
(ii)	to remove the, chlorophyll / green pigment; to decolourise the leaf; so that the colour could be seen more clearly after testing with iodine;	2 max
(c) 	shaded areas labelled blue / black; white areas labelled orange / brown;	2
(d)	absorbs light; which provides energy to make the reaction happen;	2