CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0653 COMBINED SCIENCE

0653/23

Paper 2 (Core Theory), maximum raw mark 80

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Page 2		2	Mark Scheme	Syllabus	Paper
			Cambridge IGCSE – May/June 2015	0653	23
1	(a)	(i)	1 proton; 1 electron;		[2]
		(ii)	covalent;		[1]
		(iii)	hydrogen + oxygen ; water ;		[2]
		(iv)	heat energy given out / increase in temperature;		[1]
		(v)	named metal above hydrogen in reactivity series up to and includin above hydrogen in reactivity series ;	g calcium ;	[2]
	(b)	nob	ole gas so unreactive (with oxygen) / not flammable ;		[1]
	(c)	C ₃ F	H ₈ ;		[1]
					[Total: 10]
2	(a)	(i)	carbon, hydrogen, oxygen ;		[1]
		(ii)	carbon, hydrogen, oxygen ;		[1]
	(b)	(i)	X cell membrane ; Y cytoplasm ;		[2]
		(ii)	from alveoli into blood / capillaries ; in blood ; in red cells ; carried by haemoglobin ; any valid reference to diffusion ;		[max 2]
	(c)	(en	ergy needed) for contraction of muscles / movement ;		[1]
	(d)	(i)	2760 and 2260 ;		[1]
		(ii)	Sarbjit because she used more energy; she broke down a greater amount of food stores; (allow ecf if calculation in (i) indicates the wrong girl)		[2]
		(iii)	activities done at different rates owtte;		[1]
					[Total: 11]

Page 3	Mark Scheme	Syllabus	Paper
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		L L	

3 (a) weight (accept gravity);

[1]

(b) A to B: accelerating/going faster;

[2]

- **B** to **C**: constant speed;
- (c) (distance =) speed x time (in any form); (OR use of area under graph between **B** and **C**)

[2]

- $= 25 \times 30 = 750 (m)$;
- (d) (i) reduces friction(al force) (opposing effect of gravity);

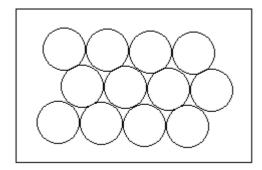
[1]

(ii) reduces air resistance (opposing effect of gravity);

[1]

(e)

[2]



or acceptable equivalent with at least 12 spheres in total regular pattern; most touching;

[Total: 9]

4 (a) (i) green to yellow / orange / red;

[1]

(ii) gas dissolves in / reacts with water etc. in atmosphere; acid rain falls on soil;

[2]

(iii) calcium chloride; water;

[2]

(b) (i) decreasing size of pieces decreases time taken/increases rate/v.v.;

[1]

(ii) increasing concentration (of acid) decreases time/increases rate/v.v.

[1]

OR

increasing temperature decreases time/increases rate/v.v.;

[Total: 7]

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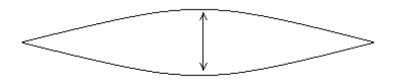
- 5 (a) (i) arrow correctly drawn from anther of flower A; to stigma of flower B; (allow 1 mark if the arrow points to the correct structures but is the wrong way round)
 - (ii) large petals; [max 2]

anthers inside flower; stigma inside flower;

- (b) (i) no germination at 4°C / in dish 3; no germination when water is absent / in dish 2;
 - (ii) (light is not needed) no mark because germination took place in dish 4;
 - (iii) oxygen; [1]

[Total: 8]

- 6 (a) (i) cello; [1]
 - (ii) harp; [1]
 - (iii) harp; [1]
 - (b) (i)



or similar diagram to illustrate a vibrating string; [1]

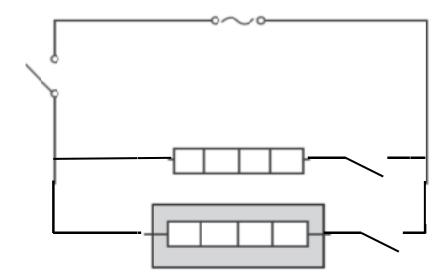
- (ii) greater amplitude / owtte ; [1]
- (c) (time delay=) distance / speed of sound; = 66 / 330 = 0.2 (s); [2]

[Total: 7]

Pa	age 5	Mark Scheme	Syllabus	Paper
		Cambridge IGCSE – May/June 2015	0653	23
7		uid lid for 2 correct, 2 for 3 correct ;;		[2]
	(b) (i)	anode cathode ; electrolyte ;		[2]
	(ii)	X on or near left-hand electrode under or just above electrolyte surface;		[1]
	(iii)	brown / orange / yellow, colouration of, electrolyte/gas;		[1]
	(c) (i)	(sodium) chloride ;		[1]
	(ii)	(sodium) iodide ;		[1]
	(iii)	trend in reactivity with other halides: $Cl > Br > I / chlorine$ is more reactive than iodine;		[1]
				[Total: 9]
8	(a) (i)	water ; sugar/glucose ;		[2]
	(ii)	zebra/lion; lion;		[2]
		errect arrow drawn from zebra to hyena ; errect arrow drawn from hyena to lion ;		[2]
	(c) (i)	by eating ;		[1]
	(ii)	carbon lost in waste materials / urine / faeces; carbon lost during respiration as carbon dioxide; not all the zebra eaten; not all the zebra digested / absorbed;		[max 2]
				[Total: 9]

Page 6	Mark Scheme	Syllabus	Paper
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- 9 (a) (i) convection; [1]
 - (ii) conduction; [1]
 - (iii) any reasonable description of thermal insulation/lagging; explanation either in terms of reducing thermal energy transfer by conduction through tank wall or the lagging preventing thermal energy transfer by convection;
 - (b) switches in both heater branches (can be either side of heater);rest of circuit completed properly;(accept any circuit that fulfils the criteria (with or without single switch))



- (c) resistance of water heater less than that of warm air heater; p.d. same across both, so current twice / higher, and so resistance must be half / lower; (or vice versa)
- (d) damaged insulation; [max 1] accept water leak / dampness the heater is not earthed;

[Total: 10]