UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0652 PHYSICAL SCIENCE

0652/02

Paper 2 (Core Theory), maximum raw mark 80

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 must be read in conjunction with the question papers and the report on the examination.

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1 (a) 124;;

(allow 1 mark for some correct working with incorrect final answer)

[2]

(b)
$$CuO_3 \rightarrow CuO + CO_2$$
;

[1]

(c) (i) use of limewater; goes cloudy/white precipitate;

[2]

(ii) conducts electricity;

[1]

[Total: 6]

2 (a) charge moves from A to B/A discharges through B; current is the movement of charge;

[2]

(b) V = IR;

60 or .060 or 600 etc.; correct unit mV or V;

[3]

[Total: 5]

3 (a) (i) wavelength correctly marked;

[1]

(ii) depth decreases;

so speed reduces; (mention of refraction C1 if nothing else scored)

[2]

(b) f = 18/4;

= 4.5 Hz;

[2]

(c) (i) ray from lamp to boy's eye reflecting off water i ≈ r;

traced back to image;

[2]

(ii) rays do not pass through the image; (accept cannot be cast on a screen)

[1]

[Total: 8]

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4	(a)	(i)	hydrochloric;	[1]
		(ii)	hydrogen ;	[1]
		(iii)	suitable drawing showing collection over water/ in a gas syringe/ by upward delivery; at least one correct label;	[2]
	(b)		M of zinc chloride = 136 (g); ss of zinc = 130 g;	[2]
				[Total: 6]
5	(a)	(i)	balance; measuring cylinder;	[2]
		(ii)	mass of empty cylinder (m_1) and mass of cylinder plus sea water; volume of water (m_2) ;	[2]
		(iii)	mass of sea water = $m_2 - m_1$; density = mass/volume;	[2]
	(b)	use V =	e of density = mass/volume ;; 250 cm³	[2]
				[Total: 8]
6	(a)		id is solidifying/freezing ;) temperature remains constant ;	[2]
	(b)		ergy is absorbed from the surroundings;	
		wat	needs energy to melt ; er absorbs energy to raise temperature only ; cognition that Cora's water has to melt C1)	[3]
				[Total: 5]
7	(a)	sulf SO ₂	fur dioxide ; 2 ;	[2]
	(b)	(me	ntion of acid rain ; ention of ozone depletion or global warning do not award this mark.) etroys buildings, damages fish/deforestation etc. ;	[2]
				[Total: 4]

[1]

[Total: 8]

Page 4			Mark Scheme: Teachers' version Syllabus				Paper	
			IGO	CSE – Octo	ber/Novem	ber 2010	0652	02
					+1;			
					+3 ; -1			[6]
								[Total: 6]
(a)	(i)	mag	netised ste	el/magnet	(accept sou	th pole);		[1]
	(ii)	sout	h (seeking)) pole at the	top and no	rth (seeking) pole	at the bottom;	[1]
(b)	(i)	a.c.	supply (<u>not</u>	<u>t</u> battery) ;				[1]
								ent
							()	[3]
((iii)	<u>both</u>	sets of pla	ayers attracto	ed by the co	ontroller;		[1]
								[Total: 7]
(a)	•	_		utants produ	ced, etc. ;			
						water)/difficult to	o store, etc.;	
				lt.at.aaa.l.	/	valata aka v		
advantage: few pollutants produced/renewable, etc.; disadvantage: CO ₂ emitted/uses land available for other crops, etc.;							[4]	
(b)	(i)	wate	er;					[1]
	(ii)	ferm	entation ;					[1]
								[Total: 6]
(2)	alka	noc l	hava anly s	single bends	(hotwoon	oarbon atoms\/sa	sturated :	
(a)								[2]
(b)								[2]
, [-]								
(c)								
			_		,			[3]
	sod alur chlo (a) (b) (b)	sodium aluminiu chlorine (a) (i) (ii) (iii) (b) (i) (iii) (a) hydradvadisa ethal advadisa (isa (isa (isa (isa (isa (isa (isa (sodium aluminium; chlorine; (a) (i) mag (ii) sout (b) (i) a.c. (iii) circu cont redu still c (iii) both (a) hydroger advantag disadvan ethanol advantag disadvan (b) (i) wate (ii) ferm (a) alkanes alkenes alkene	sodium 1: aluminium; 1: chlorine; 1: (a) (i) magnetised stern (ii) south (seeking) (b) (i) a.c. supply (no (ii) circuit diagram controller place reduce the curreduce th	sodium 11; aluminium; 13 chlorine; 17; (a) (i) magnetised steel/magnet (ii) south (seeking) pole at the (ii) south (seeking) pole at the (ii) circuit diagram with current controller placed in the sole reduce the current to zero/still on); (iii) both sets of players attracted (iii) both sets of players attracted disadvantage: no pollutants product disadvantage: expensive (to see thanol advantage: few pollutants product disadvantage: CO ₂ emitted/use (b) (i) water; (ii) fermentation; (a) alkanes have only single bonds alkenes have double bonds (be of the control of t	sodium 11; +1; aluminium; 13 +3; chlorine; 17; -1 (a) (i) magnetised steel/magnet (accept sout (ii) south (seeking) pole at the top and not (b) (i) a.c. supply (not battery); (ii) circuit diagram with current through the controller placed in the solenoid (can be reduce the current to zero/remove constill on); (iii) both sets of players attracted by the controller placed in the solenoid (can be reduce the current to zero/remove constill on); (iii) both sets of players attracted by the controller placed in the solenoid (can be reduce the current to zero/remove constill on); (iii) both sets of players attracted by the controller placed in the solenoid (can be reduced the current to zero/remove constill on); (iii) both sets of players attracted by the constitution (can be reduced to separate from the controller placed in the solenoid (can be reduced to separate from advantage: expensive (to separate from ethanol advantage: expensive (to separate from the controller placed in the solenoid (can be reduced to separate from ethanol advantage: expensive (to separate from ethanol e	sodium 11; +1; aluminium; 13 +3; chlorine; 17; -1 (a) (i) magnetised steel/magnet (accept south pole); (ii) south (seeking) pole at the top and north (seeking) pole (b) (i) a.c. supply (not battery); (ii) circuit diagram with current through the solenoid; controller placed in the solenoid (can be taken from the reduce the current to zero/remove controller from the still on); (iii) both sets of players attracted by the controller; (iii) both sets of players attracted by the controller; disadvantage: expensive (to separate from water)/difficult to ethanol advantage: few pollutants produced/renewable, etc.; disadvantage: CO ₂ emitted/uses land available for other crook (ii) water; (iii) fermentation;	sodium 11; +1; aluminium; 13 +3; chlorine; 17; -7 (a) (i) magnetised steel/magnet (accept south pole); (ii) south (seeking) pole at the top and north (seeking) pole at the bottom; (b) (i) a.c. supply (not battery); (ii) circuit diagram with current through the solenoid; controller placed in the solenoid (can be taken from the diagram); reduce the current to zero/remove controller from the solenoid (with curre still on); (iii) both sets of players attracted by the controller; (a) hydrogen advantage: no pollutants produced, etc.; disadvantage: expensive (to separate from water)/difficult to store, etc.; ethanol advantage: few pollutants produced/renewable, etc.; disadvantage: CO ₂ emitted/uses land available for other crops, etc.; (b) (i) water; (ii) fermentation; (a) alkanes have only single bonds (between carbon atoms)/saturated; alkenes have double bonds (between carbon atoms)/unsaturated; ethene; ethene;

(d) polymers/plastics;

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12 (a) use of tongs/forceps/protective clothing/gloves/lead shielding/not point source; (reject exposure time/goggles/storing in lead); [1] (b) background radiation; [1] (c) (i) random/spontaneous nature of emissions; [1] (ii) beta ×; no significant change with aluminium; gamma √ ; count rate above background even with lead/significant amount of radiation penetrates the aluminium; [4] [Total: 7] 13 (a) (X) steeper curve starting at the origin; ending at same level; [2] (Y) shallower curve starting at the origin; ending at same level; [2] [Total: 4]