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]

[2]

[1]

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

traced back to image;

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

[Total: 8]

	Page 3		Mark Scheme: Teachers' version	Syllabus	Paper	
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4	(a) (i)) hydr	rochloric;		[1]	
	(ii)) hydr	rogen ;		[1]	
	(iii)		able drawing showing collection over water/ in a gas	syringe/		
			pward delivery ; ast one correct label ;		[2]	
			zinc chloride = 136 (g) ; zinc = 130 g ;		[2]	
					[Total: 6]	
5	(a) (i)		nce ; suring cylinder ;		[2]	
	(ii)	•	s of empty cylinder (m_1) and mass of cylinder plus	sea water ;		
		volu	me of water (m_2) ;		[2]	
	(iii)	,	s of sea water = $m_2 - m_1$; sity = mass/volume;		[2]	
	(b) <u>us</u> V	<u>se of</u> d = 250 d	ensity = mass/volume ;; cm³		[2]	
					[Total: 8]	
					[10.00]	
6			solidifying/freezing;		[0]	
	(S	o) temp	perature remains constant ;		[2]	
			s absorbed from the surroundings ;			
			s energy to melt ; sorbs energy to raise temperature only ;			
	(re	ecognit	tion that Cora's water has to melt C1)		[3]	
					[Total: 5]	
7		ulfur dic O ₂ ;	oxide;		[2]	
	0.	O_2 ,			[2]	
			of acid rain ;	a :		
			of ozone depletion or global warning do not award buildings, damages fish/deforestation etc.;	tnis mark.)	[2]	
					[Total: 4]	
					· -	

· u	ge 4				: Teachers		Syllabus	Paper
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alur	niniu	-	11 ; 13 17 ;		•			[6]
								[Total: 6]
(a)	(i)	mag	netised steel/r	magnet ((accept so	uth pole);		[1]
	(ii)	sout	h (seeking) po	le at the	top and no	orth (seeking) pole at the bottom ;	[1]
(b)	(i)	a.c.	supply (<u>not</u> bat	ttery) ;				[1]
	(ii)	cont redu	roller placed in ce the current	the sole	enoid (can	be taken fror		ent [3]
	(iii)	<u>both</u>	sets of players	s attract	ed by the c	ontroller;		[1]
								[Total: 7]
(a)	adva disa etha adva	antag idvan anol antag	e: no pollutant tage: expensiv e: few pollutar	ve (to se	parate fror uced/rene	wable, etc. ;		[4]
(b)	(i)	wate	r;					[1]
	(ii)	ferm	entation ;					[1]
	. ,							[Total: 6]
(a)								[2]
(b)								[2]
(c)	rem	ains (unchanged wit	h alkane	e;			[3]
(d)	pol	lymer	rs/plastics;					[1]
	(a) (b) (b)	(a) (i) (ii) (iii) (iii) (a) hyddadvadisaa ethaaddvadisaa (b) (i) (ii) (iii) (c) use rem	aluminium; chlorine; (a) (i) mag (ii) south (b) (i) a.c. s (ii) circu contredu still c (iii) both (a) hydrogen advantaged disadvan ethanol advantaged disadvan (b) (i) wate (ii) ferm (a) alkanes halkenes ha	aluminium; 13 chlorine; 17; (a) (i) magnetised steel/ii south (seeking) po (b) (i) a.c. supply (not bare) (ii) circuit diagram with controller placed in reduce the current still on); (iii) both sets of players (a) hydrogen advantage: no pollutant disadvantage: expensive ethanol advantage: few pollutant disadvantage: CO ₂ emit of the controller placed in reduce the current still on); (iii) both sets of players (b) (i) water; (ii) fermentation; (a) alkanes have only sing alkenes have double between the current still on); (b) (ii) water; (iii) fermentation;	aluminium; 13 chlorine; 17; (a) (i) magnetised steel/magnet (ii) south (seeking) pole at the (ii) south (seeking) pole at the (b) (i) a.c. supply (not battery); (ii) circuit diagram with current controller placed in the sole reduce the current to zero/still on); (iii) both sets of players attracted. (a) hydrogen advantage: no pollutants product disadvantage: expensive (to see thanol advantage: few pollutants production disadvantage: CO2 emitted/use. (b) (i) water; (ii) fermentation; (a) alkanes have only single bonds alkenes have double bonds (be of the control o	aluminium; 13 +3; chlorine; 17; -1 (a) (i) magnetised steel/magnet (accept sout (ii) south (seeking) pole at the top and not (ii) south (seeking) pole at the top and not (iii) circuit diagram with current through the controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove controller placed in the solenoid (can reduce the current to zero/remove con	aluminium; 13 +3; chlorine; 17; -1 (a) (i) magnetised steel/magnet (accept south pole); (ii) south (seeking) pole at the top and north (seeking) (b) (i) a.c. supply (not battery); (ii) circuit diagram with current through the solenoid; controller placed in the solenoid (can be taken from reduce the current to zero/remove controller from 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 ethanol advantage: few pollutants produced/renewable, etc.; disadvantage: CO ₂ emitted/uses land available for oth (b) (i) water; (ii) fermentation; (a) alkanes have only single bonds (between carbon atom alkenes have double bonds (between carbon atoms)/to ethane; ethene; (b) ethane; ethene;	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 currential 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; (b) ethane; ethene; (c) use of bromine (water); remains unchanged with alkane;

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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);

(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 ;

[Total: 7]

[4]

[1]

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]