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## **UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education** 

## MARK SCHEME for the May/June 2010 question paper for the guidance of teachers

## 0654 CO-ORDINATED SCIENCES

0654/62

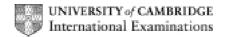
Paper 62 (Alternative to Practical), maximum raw mark 60

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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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
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1 /	(a)	Lenath	of leaves	/ mm
	la)	Lengui	OI IEAVES	, ,,,,,,,

Leaf No	Length	Leaf no	Length
1	39	11	45
2	48	12	42
3	55	13	49
4	43	14	50
5	36	15	34
6	47	16	32
7	39	17	44
8	51	28	35
9	53	29	34
10	35	20	39 ;; [2]

- (b) correct method of working (e.g. 856/20 =); correct answer inside range 40.8 44.8; [2]
- (c) (i) correct numbers entered e.g. 3, 6, 3, 4, 2, 2; numbers add to 20; [2]
  - (ii) suitable scale and label on vertical axis; ranges labelled on bars of equal width; correct heights of bars; [3]
- (d) any suitable factor, e.g. variation in light intensity / carbon dioxide concentration / water minerals / temperature;[1]

[Total: 10]

- **2** (a) (i) no colour; [1]
  - (ii) calcium chloride; [1]
  - (b) (i) method A [1]
    - (ii) EITHER
      method **B** because ammonia is lighter (less dense) than air;
      or
      method **C** because ammonia is soluble in (reacts with) water; [max 1]
  - (c) (i) zinc (Zn); [1]
    - (ii) (light) blue colour ;
      dark (deep) blue (both essential) ;
      [2]
    - (iii) (red to) blue; [1]

	Page 3				heme: Tea				Syllabus		Paper
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	(:	soli	monia gas reacts with hydrogen chloride gas ; lid) ammonium chloride (NH₄C <i>l</i> ) is formed ;								
		or equa	ation give	en with <b>all</b> sta	ate symbols	s;					[max 2]
											[Total: 10]
3	(a) (	(i)	21.9 g ar	nd 23.1 g (ex	xact) ;;						[2]
	(i	ii)	23.1 – 2′	1.9 = 1.2 g (e	ecf);						[1]
	(b) (	(i)	process .	<b>A</b> = evapora	ition / evapo	orating ;					[1]
	(i	ii)	process	<b>B</b> = condens	sation / con	densing	;				[1]
	(c) (	(i)	1.2 cm <sup>3</sup> (	ecf);							[1]
	(i			of steam fron	n 1 cm³ wat	ter = 20	$\frac{000 \times 1}{1.2}  \text{(eq)}$	of);			[2]
		stea stea		much greate	er volume th	nan the	water/wate	r expands	s when it be	comes	
			nsion ca ΓΤΕ ;	uses a force	e / the partion	cles of s	team have	a large k	inetic energ	jy /	[2]
											[Total: 10]
4	d	disp	ace wate	with water ; er by blowing tube into a g		as-jar m	ust <b>not</b> be	stoppere	d) (award 1	only)	[max 2]
	(b) (		inhaled a	air 7.5 s ; air 5.5 s ;							[2]
	(i	•	7.0 s ; 5.0 s ; (a	ward 1 mark	c for '7' and	'5')					[1] [1]
	(c) (	(i)	goes mill	ky / cloudy ;							[1]
	(i	ii)	respiratio	on;							[1]
	(ii	ii)	before ex	kercise 8.4 s	and after e	exercise	3.2 s;				[1]
	(iv	v)	increase	d respiration	rate (durin	ig exerc	ise);				[1]

[Total: 10]

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper	
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**5** (a) 62 cm<sup>3</sup>, 45 cm<sup>3</sup>, 6 cm<sup>3</sup> (no tolerance) ;;;

- (b) concentration = 1.2, 0.8, 0.4 (no tolerance) all 3 correct; correctly recorded in Table 5.1; [1]
- (c) at least one axis correctly labelled and suitable scales chosen; all points correctly plotted, (± 1 cm³ and 0.05 mol / dm³); suitable straight line drawn; [3]
- (d) (i) same mass of magnesium (NOT same amount); same surface area of magnesium; [2]
  - (ii) volume of hydrogen given off is **proportional to** the concentration of the hydrochloric acid. (Words in heavy type must be used.); [1]

[Total: 10]

6 (a) mass of can = 29 g (no tolerance);
 t<sub>2</sub> = 70 °C (no tolerance);
 t<sub>3</sub> = 66 °C (no tolerance);

t<sub>3</sub> = 66 °C (no tolerance); volume of water = 42 cm<sup>3</sup> (no tolerance); [4]

(b) (i) 
$$(t_3 - 25 =) 66 - 25 = 41 \, ^{\circ}\text{C}$$
; [1]

(ii) 
$$70-66=4$$
 °C;

(iii) specific heat = 
$$\frac{4 \times 42 \times 4.2}{41 \times 29}$$
;  
= 0.59 (accept 0.6); [2]

(c) current in amps;

time in seconds **or** minutes; [2] (the order of the answers is not important)

(Allow 'power (energy used) in watts' instead of current in amps.)

('Time in seconds or minutes' must be **one** of the answers for two marks to be awarded.)

[Total: 10]