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

0654 CO-ORDINATED SCIENCE

0654/52 Paper 5 (Practical), maximum raw mark 45

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) (i) masses recorded correctly ; (5–15 g to at least 1 decimal point)
name of juice recorded correctly ;

(ii) table headings correct including units (at least once) ;
table laid out correctly ; [2]

(b) calculation correct for tube **1** ;
calculation correct for tube **2** ;
calculation correct for tube **3** ;
calculation correct for tube **4** ;
(if there is increase, not greater than 10 %) [4]

(c) correct answer from student's data ;
shows greatest loss in mass, or greatest proportional loss ; [2]

(d) use water instead of juice ;
see if the protein would have lost mass anyway ; [2]

(e) set up same experiment with protein and acid ;
weigh protein before and after experiment ;
compare masses to see if any mass lost ; [3]

alternative answer:
neutralise acid in juice ;
weigh protein before and after ;
if mass still lost, then its protease and not acid ;

[Total: 15]

2 (a) (i) value of $\mathbf{d}_1$ must be less than $\mathbf{d}_2$ but greater than $\mathbf{d}_2 / 2$;
(if clearly in cm do not give mark)

(ii) value of $\mathbf{d}_2$ (should be close to supervisor value if no note about size of blocks differing) ; [1]

(iii) correct calculation of $\mathbf{d}_2 / \mathbf{d}_1$ ((at least 1 decimal point recorded), any rounding up must be correct) ; [1]

(b) (i)

***i*°**	**sine *i***	***r*°**	**sine *r***
0	0.00		
0	0.17		
20	0.34		
30	0.50		
40	0.64		

;

all other ***r*** values greater than matching ***i*** value ;
r value increase with increasing ***i*** ;
4 readings of ***r*** ; [4]

(ii) correct **sine r** values put in table ; [1]

(c) (i) axes must be labelled with sine ***r*** vertical and sine ***i*** horizontal ;
scales must be marked clearly and must be linear ;
(0,0) plotted or line through zero
at least 3 points must be plotted within ½ square ;
best straight line through points ; [4]

(ii) correct value of gradient ignoring decimal places but not allowing incorrect rounding ;
working can be fraction or triangle on graph with figures on sides of triangle ; [2]

(iii) it is the average of several readings / idea of more than one set of readings ;
or looking through block is difficult to do ; [max 1]

[Total: 15]

3 (a)

solution	observation on adding sodium carbonate	conclusion the solution must have the following present	possible identity of solution
A	fizzes / bubbles / effervesces	acid / H^+	HCl HNO_3
B	no reaction / solid dissolves	no acid / no H^+	$NaCl$ KNO_3
C	no reaction / solid dissolves	no acid / no H^+	$NaCl$ KNO_3
D	fizzes / bubbles / effervesces	acid / H^+	HCl HNO_3

whole observation column correct ;
whole conclusion column correct ;
the **two** possible identities for each solution ;;;; [6]

(b)

solution	observation on adding silver nitrate solution	conclusion the solution must have the following present	identity of solution
A	white ppt / white solid	chloride / Cl^-	HCl / hydrochloric acid
B	white ppt / white solid	chloride / Cl^-	$NaCl$ / sodium chloride
C	no reaction / remains colourless	no chloride / no Cl	KNO_3 / potassium nitrate
D	no reaction / remains colourless	no chloride / no Cl	HNO_3 / nitric acid

whole observation column correct ;
whole conclusion column correct ;
the correct identity for each solution ;;;; [6]

(c) add aqueous sodium hydroxide / NaOH, **plus** aluminium / Al, **plus** warm / heat ;
damp red litmus (paper) in gas / mouth of test tube ;
litmus turns blue (if states ammonia given off without test, allow 1 mark) ; [3]

[Total: 15]