

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**MARK SCHEME for the May/June 2011 question paper**  
**for the guidance of teachers**

**0654 CO-ORDINATED SCIENCES**

**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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Page 2	Mark Scheme: Teachers' version	Syllabus	
	IGCSE – May/June 2011	0654	

- 1 (a) *table*  
 start and maximum temperature recorded (maximum higher than start and not greater than 100) ;  
 consistent recording of temperatures ;  
 mass of bread recorded to 0.1 g ; [3]
- (i) correct calculation of maximum – start ; [1]
- (ii) correct substitution ;  
 calculation of energy with correct rounding and maximum of 3 decimal places ; [2]
- (iii) (no)  
 loss to atmosphere ;  
 loss to boiling tube ;  
 incomplete combustion ;  
 water not evenly heated ;  
 draughts affecting flame ; [max 2]
- (iv) insulation ;  
 stirring ;  
 shield flame ;  
 distance between flame and tube minimised ; [max 1]
- (b) *iodine*:- (from) orange / red / brown (allow colourless)  
 (to) black / blue ; [1]  
 starch ; [1]
- Benedict's*:- (from) blue  
 (to) red / orange / brown / yellow / green ; [1]  
 (reducing) sugar / maltose / glucose / monosaccharide ; [1]
- (note: if Centre's bread does not reduce Benedict's allow :-  
 (from) blue  
 (to) blue ;  
 no reducing sugar present ;)
- biuret*:- mark according to Supervisor's Results  
**EITHER** (from) blue  
 (to) lilac / purple / mauve ; [1]  
 protein ; [1]
- OR** (from) blue  
 (to) blue ;  
 no protein present ;
- (in each case, 1 mark is for the **from and to** colours and 1 mark is for the correct interpretation)

[Total: 15]

Page 3	Mark Scheme: Teachers' version	Syllabus	
	IGCSE – May/June 2011	0654	

## 2 (a) and (b)

- 5 values of **d** and **N** ;  
 1st.value of **d** is 100 ;  
 rest of values of **d** spaced at 50 mm ;  
 suitable numbers for force increasing with increasing distance ; [1]

(c) (i) *graph*

- axes correctly labelled ;  
 suitable scale ;  
 plotting correct for at least 4 points ;  
 suitable straight line ; [4]

- (ii) line extended to cut vertical axis ; [1]

- (d) (i) read correctly ; [1]

- (ii) converted correctly into a mass ; [1]

- (iii) mass of rule ;  
 accuracy (2 **m**) ; (within 10% of Supervisor's Results) [2]

## (e) sensible answer

- e.g. measure distance of ruler to bench ;  
 either side of the fulcrum ; [2]

[Total: 15]

Page 4	Mark Scheme: Teachers' version	Syllabus	
	IGCSE – May/June 2011	0654	

- 3 (a) (i) green ; (ignore reference to white)
- (ii) residue is white ; (ignore reference to green)  
filtrate blue/blue-green ;
- (b) (i) blue ppt. ;  
insoluble in excess ; [2]
- (ii) blue ppt. ;  
dissolves in excess ; (can be implied)  
dark blue solution ; [3]
- (iii) white ppt. ; [1]
- (iv) cation is copper/ $\text{Cu}^{2+}$  ;  
anion is sulfate/ $\text{SO}_4^{2-}$  ; [2]
- (c) fizzing/effervescence ;  
carbonate present/ $\text{CO}_3^{2-}$  ; [2]
- (d) (i) white ppt ; [1]
- (ii) zinc/aluminium ; [1]

[Total: 15]