



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**COMBINED SCIENCE**

**0653/62**

Paper 6 Alternative to Practical

**May/June 2016**

**MARK SCHEME**

Maximum Mark: 60

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**Published**

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- 1 (a) reducing sugar    protein    starch ;; [2]

3 correct = 2 marks, 1 correct = 1 mark

- (b) to release nutrients from the cells/break open the cells/let reagent/solution in ; [1]

(c)

blue ;	blue ;	(blue–)black ;
yellow/green/orange ;	blue ;	(blue–)black ;

all 6 correct = 3 marks, 4/5 correct = 2 marks, 2/3 correct = 1 mark

[3]

- (d) peel or crush peas/sweetcorn ;  
(dissolve in) ethanol ;  
water added ;  
cloudy/emulsion ;  
no naked flames (ignore other safety precautions) ;

[max 4]

[Total: 10]

- 2 (a) test:  
dissolve **D** in (distilled) water ;  
add ammonia (solution) ;

*observations:*

(different) colour of ppt. (identifies metal cation) ;

[3]

- (b) (i) **D** and limewater correctly labelled ;  
glassware correct ;  
(in two separate containers connected somehow)  
(delivery tube must be under level of limewater)

[2]

(ii) carbonate /  $\text{CO}_3^{2-}$  ;

[1]

- (c) sulfate /  $\text{SO}_4^{2-}$  ;  
chloride /  $\text{Cl}^-$  ;

[2]

- (d) sodium hydroxide (solution) / NaOH / LiOH / KOH ;  
blue ppt. ;

[2]

[Total: 10]

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- 3 (a) 77.0 ; [1]
- (b) both units correct, s and °C (in table) ; [1]
- (c) (i) 8.5 (°C) ; [1]
- (ii) 0.047 ; [1]
- (d) (i) 6.5 (°C) ; [1]
- (ii) 0.036 ; [1]
- (e) using a lid / beaker Q AND because  $R_Q$  is less than  $R_P$  / lower fall in temperature in same time ; [1]  
(accept reverse argument for the reason)
- (f) thicker insulation ;  
insulate the bottom of the beaker ; [2]
- (g) (same) size (thickness) of beakers / (same) volume of water / (same) initial temperature of hot water / (same) room temperature / (same) material / position of thermometer / surface area of liquid ; [max 1]
- [Total: 10]**

- 4 (a) geotropism ; [1]
- (b) (i) horizontal / same direction / continues straight ; [1]
- (ii) effect of gravity on the seedling has been removed ; [1]
- (c) young root points down ;  
approximately same length as Fig. 4.2 ; [2]
- (d) bean seedlings different / only 1 / 2 seedling used / different growth rates ; [max 1]
- (e) upwards ; [1]
- (f) water ;  
warmth / correct / suitable temperature ;  
suitable substrate e.g. cotton wool ; [3]
- [Total: 10]**

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- 5 (a) (i) measuring cylinder / burette / pipette / syringe ; [1]
- (ii) evens the temperature / ensures mixing / ensures max T ; [1]
- (iii) reaction / reactant has finished / no more heat evolved ; [1]
- (b) (i) 6 AND 10 ; [1]
- (ii) 4 points plotted (within half square) ;  
curve ; [2]
- (iii) full line from their maximum and value  $V_2$  ; [1]
- (iv) value  $C_2$  ( $2 \times 50 / (b)(iii)$ ) ; [1]
- (c) more readings around max (20–35) / insulate beaker / use burette not ms  
(dependent on answer to (a)(i)) / add an indicator / stir with thermometer ;; [max 2]

[Total: 10]

- 6 (a) (i) 36 ;  
43 ; [2]
- (ii) correct scale on vertical axis (starts at 20 ends at 50) ; [1]
- (iii) correct plotting of min 5 points silver can ;  
correct plotting of min 5 points white can ;  
three reasonable curves ;  
each line labelled ; [4]
- (b) containers same size ;  
volume same in each container ;  
containers same distance from heater ; [3]

[Total: 10]