Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES **0654/62**

Paper 6 Alternative to Practical **May/June 2016**

MARK SCHEME

Maximum Mark: 60

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 ; [2]
(in two separate containers connected somehow)
(delivery tube must be under level of limewater)

(ii) carbonate / CO_3^{2-} ; [1]

(c) sulfate / SO_4^{2-} ;
chloride / Cl^- ; [2]

(d) sodium hydroxide (solution) / NaOH / LiOH / KOH ;
blue ppt. ; [2]

[Total: 10]

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]

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 (2×50 / **(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]