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.<u>0</u> ;   [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 <u>AND</u> because R_Q is less than R_P / lower fall in temperature
<u>in same time</u> ;   [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 <u>AND</u> 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]