COMBINED SCIENCE **0653/62**

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

MARK SCHEME

Maximum Mark: 60

Published

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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 <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]

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**]