Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/52**

Paper 5 Practical **October/November 2016**

MARK SCHEME

Maximum Mark: 30

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)** full set of results ;

all results to the same number of decimal places ;

evidence that reaction is slowing at end (not linear increments) ; [3]

(b) axes labelled with units ;

linear scale using at least half the grid ;

at least 4 plots correct ± half small square ;

best fit curve ; [4]

(c) **(i)** any **two** **(for one mark)** from:

constant volume of hydrogen peroxide / constant concentration of hydrogen peroxide / constant size of celery / pH / type of celery [1]

(ii) at least 5 stated temperatures ;

at least two temperatures below 40 °C and two temperatures above 40 °C ; [2]

2 **(a)** **(i)** T_i for concentration 1.00 X ; [1]

(ii) T_h for concentration 1.00 X recorded to nearest half degree **AND** above T_i ; [1]

(iii) T_h for concentration 0.75 X recorded
AND ΔT for 0.75 X lower than ΔT value for 1.00 X ; [1]

(iv) T_h for concentration 0.75 X recorded
AND ΔT for 0.75° X lower than ΔT value for 1.00° X ; [1]

(v) remaining T_i and T_h values for 0.50 X and 0.25 X ;

ΔT values decrease down table ; [2]

(b) **(i)** all ΔT values recorded and correct for temperatures recorded (minimum three experiments) ; [1]

(ii) supports **AND** evidence e.g. 1.00 X to 0.50 X halves ΔT
OR
does not support **AND** evidence e.g. 1.00 X to 0.50 X nowhere near halves ΔT ; [1]

(iii) plot a graph ΔT of against concentration ; [1]

(c) lid / insulation around flask / rinsing (and drying) of small beaker / extra points / more accurate thermometer ; [1]

3 **(a)** **(i)** *a* recorded to the nearest 0.1 cm ; [1]

(ii) *b* value correct ($b = 35 - a$) ; [1]

(iii) note the reading on either side and find mean / measure cube and mark the centre point ; [1]

(b) *M* recorded to the nearest gram ; [1]

(c) *m* correct ;

2 / 3 significant figures [2]

(d) mass of clay recorded ; [1]

(e) any **two** from:
centre of gravity of the rule not at the 50 cm mark / difficulty in obtaining balance / rounding errors / pivot not perpendicular to edge of rule / centre of gravity of cube not over the mark due to irregular shape ;; [2]

(f) *a* smaller and *b* larger ; [1]