Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/51**

Paper 5 Practical Test **May/June 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) time (in) minutes ; [2]
volume (in) cm^3 (ALLOW ml);

time with no units and volume with no units = 1 mark

(b) full set of results for **A** ; (ALLOW zeros if SV has zeros) [3]
full set of results for **B** ; (ALLOW zeros if SV has zeros)
more juice produced in **B** for at least 4 readings;

(c) axes labelled with units (ecf from **(a)** but IGNORE ecf if correct) ; [4]
suitable linear scale using at least half the grid ;
at least 4 plots correct ± half small square ;
best-fit line ; (IGNORE extrapolation to zero)

IF plot **A** and **B** IGNORE **A**
IF plot **A** only then cannot score MP3 but can score but can score M1, M2 and M4
IF all points are zeros then can only score M1

(d) increases amount of juice produced per unit time / more juice / speeds extraction process ; [1]

2 (a) (i) reading for **C** (not zero) ; [4]
readings for **D** and **E** (not zero) ;
all readings in s ;
D>E>C ;

(ii) **C** is 2.00 mol dm^{-3} [2]
D is 0.50 mol dm^{-3}
E is 1.00 mol dm^{-3}

one correct ;
all three correct ;

(b) apparatus [4]
stopwatch **AND** one of: test-tube, measuring cylinder, delivery tube as appropriate / apparatus for measuring volume of acid **AND** apparatus for adding drops of alkali ;

fair test
add same amounts or size of Mg / marble chip / UI (to acid solutions) / same volume of acid (if doing neutralisation) same temperature ;

measurement
count bubbles (in a certain time) / time for marble chip to disappear / time for limewater to go milky / volume of gas (in a certain time) / volume of NaOH to change UI ;

conclusion
more bubbles is more concentrated / more volume of gas is more concentrated / shorter time is more concentrated / greater volume of NaOH is more concentrated ;

3 (a) (i) *p* value for d = 5.0 recorded ; [1]
ALLOW p>50

(ii) values of *p* increasing ; [1]

(b) all recorded *x* values correct ; [2]
all recorded *y* values correct ;

(c) (i) suitable choice of scales (⩾ ½ the grid used) ; [3]
at least 3 points plotted correctly to ½ small square (penalise 'blobs') ;
good best-fit straight line judgement ;

IF plot d can only get M3

(ii) indication on graph of how data were obtained **AND** more than half the line used ; [2]
calculation correct ;

DO NOT ALLOW either marks if gradient taken over non-linear scale part of line
IGNORE missing minus if negative gradient

(d) *m* present to 2 / 3 significant figures and correct rounding ; [1]