



CO-ORDINATED SCIENCES

0654/51

Paper 5 Practical Test

May/June 2016

MARK SCHEME

Maximum Mark: 45

Published

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- 1 (a) time (in) minutes ;
volume (in) cm³; [2]
- time with no units and volume with no units = 1 mark
- (b) full set of results for **A** ;
full set of results for **B** ;
more juice produced in **B** for at least 4 readings ; [3]
- (c) axes labelled with units (ecf from (a) but IGNORE ecf if correct) ;
suitable linear scale using at least half the grid ;
at least 4 plots correct \pm half small square ;
best-fit line ; [4]
- IF plot **A** and **B** IGNORE **A**
IF plot **A** only then cannot score M3 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]
- (e) wore goggles / tied hair back / gloves **AND** reason e.g. due to enzyme ; [1]
- (f) show that the water of enzyme solution does not have an effect / no effect without enzyme / shows effect of just water ; [1]
- (g) at least 3 different temperatures ;
same volume of enzyme / same volume of fruit pulp / same incubation time ;
measure volume of fruit juice for each temperature / one producing most juice in a fixed time is optimum ; [3]
- [Total: 15]**
- 2 (a) (i) reading for **C** (not zero) ;
readings for **D** and **E** (not zero) ;
all readings in s ;
D>E>C; [4]
- (ii) **C** is 2.00 mol / dm³
D is 0.50 mol / dm³
E is 1.00 mol / dm³
- one correct ;
all three correct ; [2]

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(b) apparatus

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 ;

[4]

- (c) (i)** use of barium chloride and silver nitrate separately ;
barium chloride no ppt. ;
silver nitrate white ppt. ;

[3]

- (ii)** hydrochloric
AND
chloride (identified)/ white ppt. with silver nitrate ;

[1]

- (d)** time too long for Mg to disappear/ reaction too slow/ metal in (vast) excess/ not enough acid present/ Mg would not react ;

[1]

[Total: 15]

- 3 (a) (i)** *p* value for *d* = 5.0 recorded ;

[1]

- (ii)** all values of *p* recorded and at least one to 0.1 cm ;
values of *p* increasing ;

[2]

- (b)** all recorded *x* values correct ;
all recorded *y* values correct ;

[2]

- (c) (i)** axes labelled with units ;
suitable choice of scales ($\geq \frac{1}{2}$ the grid used) ;
at least 4 points plotted correctly to $\frac{1}{2}$ small square ;
good best-fit straight line judgement ;

[4]

IF plot d can only get M4

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

[2]

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

(e) m_1 present to the nearest gram [1]

(f) **any two from:**

difficulty in obtaining balance ;

centre of mass of rule not at the 50.0 cm mark ;

load **L** not uniform ;

difficulty in placing the centre of **L** over the mark on the rule ;

difficulty in taking reading above fulcrum ;

max. [2]

[Total: 15]