

MARK SCHEME for the May/June 2008 question paper

0653, 0654 COMBINED SCIENCE

0653, 0654/06 Paper 6 (Alternative to Practical), maximum raw mark 60

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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1 (a) (i) xylem/vascular bundle [1]

(ii) Diagram: showing wilting of leaves, (but not of main stalk) (1)

Explanation: water lost from leaves/leaves dry out (1)

by evaporation/transpiration (through guard cells)(1)

turgor (pressure) lost/leaves become flaccid (1)

Any 2 of the last 3 points (2)

[3]

(b) (i) wind speed/air movement OR humidity/amount of moisture in the air OWTTE [1]

(ii) stand celery stems in dye (1)

at different temperatures OWTTE (1)

for same length of time (1)

cut stems (1)

to compare how far the dye has travelled (1) Any 3 points

(allow only 2 marks for potometer method adequately described)

[3]

[Total: 8]

2 (a) (i) 48, 51, 49, 52 : 4 correct (2), 2 or 3 correct (1) 1 or 0 correct (0)
(no tolerance) [2]

(ii) 50s (ecf) [1]

(iii) $60/50 = 1.2 \text{ m/s}$ (ecf) (working need not be shown) [1]

(iv) $\frac{27}{3 \times 60}$ (1) = 0.15 (Hz) (1)
(allow 1 mark for 27/3) [2]

(v) point S [1]

(b) (i) vertical arrow to show movement of ribbon [1]

(ii) hand movement increased, (1) more movements per minute (1) OWTTE [2]

[Total: 10]

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3 (a) yellow powder – S, colourless gas – Ar, solid under oil – Na [3]

(b) circuit completely correct (2)
voltmeter in series with other components (–1)
polarity of ammeter or voltmeter incorrect (–1) [2]

(c) (i)	sodium	magnesium	phosphorus	sulphur
(ii)	yellow	white	white	blue
(iii)	sodium oxide solid	magnesium oxide solid	phosphorus oxide solid	sulphur dioxide gas
(iv)	blue	blue	red	red

any column correct [4]
if burning of aluminium is described do not allow a mark for (i)

(v) suitable answers include:
use of fume cupboard, don't breathe fumes: reason: poisonous gas,
hold burning element in (metal) spoon: reason: danger of burning
tie back (long) hair: reason: danger of burning
use blue glass when burning magnesium: reason: to protect sight
reason must match safety precaution [1]

[Total: 10]

4 (a) (i) correctly labelled vertical scale, (2 cm = 10 bubbles) (1)
points plotted correctly (allow one error) (1)
smooth curve drawn (1) [3]

(ii) (below 45°) rate increases/optimum temperature (reached) (1)
because reacting particles move faster (1) have greater energy (1)
more frequent collisions (with the enzyme) (1) (any 2) [2]

(above 45°) rate decreases (1)
because enzyme is denatured (reject "killed") (1) [2]

(b) Diagram shows syringe/inverted measuring cylinder over water (1)
graduations shown (1) [2]

(c) replace sucrose with same concentration/amount/volume of glucose (1)
at same temperature(s) (1) same amount of yeast (1)
measure no. of bubbles/gas volume/compare activity (1) (any 3 points) [3]

[Total: 12]

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- 5** (a) 1, 1.5, 2 (newtons) no tolerance, all correct [1]
- (b) 286, 268, 250 (+/- 1 mm) [3]
- (c) 18, 36, 54 mm (ecf) (2 or 3 correct) [1]
- (d) suitable scale used and at least 1 axis labelled correctly (1)
all points plotted (1)
line drawn passing through the origin (1) [3]
(subtract 1 mark if axes are reversed)
- (e) extension produced by 80g found using graph, 29 mm (+/- 1mm) (ecf) [1]
- (f) graph shows a curved line with extension increasing [1]
- [Total: 10]**
- 6** (a) (i) hydrogen/H₂/H [1]
- (ii) (dilute) sulphuric acid/H₂SO₄ [1]
- (b) (i) no change or blue (solution): ecf from (a)(ii) [1]
- (ii) copper carbonate/CuCO₃ [1]
- (c) (i) e.g. a carbonate + acid (minimum answer)
allow any form of calcium carbonate
(do not allow calcium carbonate + sulphuric acid) [1]
- (ii) white (precipitate) milky/cloudy/chalky [1]
- (d) (i) blue [1]
- (ii) sodium sulphate (1) + carbon dioxide(1) (in any order) [2]
- (iii) solution A, because more of B is needed (essential) [1]
- [Total: 10]**