**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# 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

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.

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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

**1 (a) (i)** xylem/vascular bundle

**(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 [3]
(allow only 2 marks for potometer method adequately described)

**[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 m/s (ecf) (working need not be shown) [1]

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

**(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]**

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

**(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]**

**5** **(a)** 1, 1.5, 2 (newtons) no tolerance, all correct

**(b)** 286, 268, 250 (+/– 1 mm) [1]

**(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/$H_2$/H [1]

**(ii)** (dilute) sulphuric acid/$H_2SO_4$ [1]

**(b)** **(i)** no change or blue (solution): ecf from **(a)(ii)** [1]

**(ii)** copper carbonate/$CuCO_3$ [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]**