UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the June 2005 question paper

0653 COMBINED SCIENCE

0653/03   Paper 3 (Extended Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

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Grade thresholds for Syllabus 0653 (Combined Science) in the June 2005 examination

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 3	80	54	30	20	16

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

June 2005

IGCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0653/03

COMBINED SCIENCE
Paper 3 (Extended Theory)

1 (a) stamens/anthers, dangling/outside flower;
wind can catch pollen;
or
stigma, dangling/outside flower;
can catch pollen from air;
or
stigma feathery;
can catch more pollen; **max [2]**

(b) (i) this cell has chloroplasts/P does not have chloroplasts;
this cell photosynthesises/P does not photosynthesise; **[2]**

(ii) contains, chromosomes/genes/DNA;
(which contain) inherited information;
controls activities of cell;
ref. to protein synthesis ; **max [2]**

(c) (i) xylem; **[1]**

(ii) out of cell by osmosis;
evaporation (from cell wall);
diffusion;
as water vapour;
through stomata; **max [3]**

2 (a) (i) potassium + chlorine = potassium chloride; **[1]**

(ii) flames; **[1]**

(b) $KOH + HCl \rightarrow KCl + H_2O$; **[2]**

(c) (i) potassium ions are positive;
and are attracted to the negative (cathode); **[2]**

(ii) gain electrons;
one electron each;
ions discharged; **max [2]**

3 (a) (i) 20 Hz or lower; **[1]**

(ii) vibration passes from one particle to the next;
compressions and rarefactions;
longitudinal waves/description; **max [2]**

(b) (i) work = force x distance;
0.02 x 21/100 = 0.0042 J; **[2]**

(ii) power = work/time;
0.0042/7 = 0.0006 W; **[2]**

(iii) force = mass x acceleration;
0.002 x 0.02;
0.00004 N; **[3]**

(c)   white fur;
poor emitter of radiation;

fur traps air;
good insulator;

much fat;
good insulator;   **max [2]**

4 (a) (i)   650   **[1]**

     (ii)   as sulphur dioxide goes up, deaths go up;   **[1]**

     (iii)   idea of delay between exposure and death;   **[1]**

  (b)   dissolves in water;
forms sulphuric acid/sulphurous acid;   **[2]**

  (c)   prevents/reduces, entry of carbon dioxide/absorption of light;   **[2]**
so less photosynthesis;

5 (a) (i)   argon, is noble gas/inert gas/full outer shell;   **[1]**

     (ii)   magnesium and, oxygen/hydrogen;   **[1]**

     (iii)   magnesium and argon;   **[1]**

  (b) (i)   3.2 g;   **[1]**

     (ii)   4.8 g magnesium reacts with 3.2 g oxygen, so 2.4 g reacts with 1.6 g;   **[2]**
5.0 - 1.6 = 3.4 g;

  (c) (i)   hydrogen;   **[1]**

     (ii)   concentration of acid;   **[1]**

     (iii)   50 and 105;   **[1]**

     (iv)   1 and 2;   **[2]**
temperature/all other variables, were kept constant;

6 (a) (i)   straight lines bending at interface and reaching eye ;   **[1]**

     (ii)   lines extended backwards;
light appears to travel in straight lines;   **[2]**

  (b)   resistance = voltage/current;
10 ohms;   **[2]**

  (c)   convection;
hot water rises/cold water sinks;
hot water less dense/cold water more dense;   **max [2]**

7 (a)   A oesophagus;   **[2]**

(b)   line from mouth to starch and starch to glucose;
line from small intestine to fat and protein to amino acids;

(c)   function is digestion/absorption;
more time for these to take place;
larger surface area for absorption;   **max [2]**

(d) **(i)**   respiration;
glucose and oxygen;
changed to carbon dioxide and water;
ref. to ATP;   **[2]**

      (ii)   add Benedict's and heat;
yellow/red, colour if present;   **[2]**

8 **(a)**   coal;   **[1]**

   (b)   (thermal) decomposition;
small molecules being formed from larger ones;   **[2]**

   (c) **(i)**   propane has only single bonds/no double bonds;
between carbon atoms;
if double bonds present bromine decolourises;   **max [2]**

      (ii) $C_3H_8 + \mathbf{5}O_2 \rightarrow 3CO_2 + \mathbf{4}H_2O$;   **[1]**

     (iii)   (12 x 3) + (8 x 1);
44;   **[2]**

9 **(a)** **(i)**   arrow points downwards;   **[1]**

      (ii)   forces are equal and opposite;   **[1]**

   (b)   C in suitable position;   **[1]**

   (c) **(i)**   use measured volume of water;
submerge toy and calculate change in level/volume of water
displaced;   **[2]**

      (ii)   density = mass/volume;
7.5/3.0 = 2.5 g/cm^3;   **[2]**