

## **MARK SCHEME for the May/June 2008 question paper**

### **0610 BIOLOGY**

**0610/06**

Paper 6 (Alternative to Practical), maximum raw mark 40

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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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Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2008	0610	6

- 1 (a) (i) **A** axes – orientation and labels y-axis temperature °C and x-axis time in minutes;  
**S** scale – even scale to fill over ½ the printed grid; [*check plots*]  
[*R inverted scale*]  
**K** suitable key or lines labelled;  
**L** line joining point to point by ruler;  
(not: curve/line of best fit/free-hand/extrapolation)  
**P** allow +/- 1mm, lose 1 P per error;  
**P**;

If a histogram, award **A** and **K** marks only.

[max 5]

(ii)

Flask	Explanation	End points °C	Difference °C	Decrease °C
<b>A v B</b>	<b>A</b> loses more heat/cooling quicker or converse for <b>B</b>	45 and 60	15	25 and 10 <b>or A 2.5 x B</b>
<b>B v C</b>	<b>C</b> loses more heat/cooling quicker or converse for <b>B</b>	40 and 60	20	30 and 10 <b>or C 3 x B</b>
<b>C v A</b>	<b>C</b> loses more heat/cooling quicker or converse for <b>A</b>	40 and 45	5	30 and 25 <b>or use of figures</b>

1 mark per row for **figures**. All figure columns are alternatives.  
1 mark only for all 3 trends given correctly. [*explanation column*]

[max 3]

(iii)

- (dry) cotton wool/flask **B** – link to insulation;
- traps (warm) air or heat/does not let heat escape/keeps heat in;
- wet cotton wool/flask **C** – link to evaporation;
- latent heat/evaporation takes heat;
- (no cover on **A**) – loss of heat by radiation;

[max 3]

(b) (i)

- same size containers/same (shape) apparatus;
- thermometers similar range/suspended in same position/did not touch glass;
- same volume/amount of water;
- start at same temperature/70 °C;
- readings at same time intervals/AW;
- lids (the same);

[max 3]

<b>Page 3</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – May/June 2008</b>	<b>0610</b>	<b>6</b>

(ii)

- same (external) conditions/surrounded by shield/prevent draughts;
- equal cotton wool for B and C;
- repeats/calculate the average;
- more frequent readings (not continuing for longer time);
- more accurate/digital thermometer;
- stirring water/heat evenly distributed;
- use of stop clock/own watch;

AVP;

[max 2]

**[Total: 16]**

- 2 (a) Drawing: **O** clear, continuous outline and no shading;  
**S** 7–10 seeds on left and 4 on the right;  
**C** cavity of seed area larger on the left than the right;

Labels: seeds/placenta/pericarp/fruit wall;  
(remains of) calyx/sepals/stalk/pedicel;

*[ignore stem, pips, branch, petiole, peduncle] [ecf for pips, stem in (b)(i)] [if apple drawn, allow labels only]*

[5]

- (b) (i) Give **four** differences.

Table 2.1

<b>Feature</b>	<b>Tomato</b>	<b>Apple</b>
<b>Seeds</b>	many (11–14)	one seed
	towards edge	central/middle
	space for seeds/seed chamber	solid/no space
	small seeds	large seed
	light seeds	dark seed
<b>Fruit</b>	smaller	larger
	darker	lighter
	round/no dent	dent top and bottom
	large placenta/core	smaller/no core
	bottom of fruit smooth/round	bottom is where flowers remains are/AW
<b>Wall</b>	thin wall/not much flesh	thick wall/mainly flesh
	calyx/sepals large/present	calyx/sepals small/absent
	calyx same end as stalk	calyx opposite end to stalk

*Ignore references to colour, juice, moisture, texture, hard/soft, stalk differences.*

[max 4]

<b>Page 4</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – May/June 2008</b>	<b>0610</b>	<b>6</b>

(ii) **Two** from:

- fruit shape – bilateral symmetry/round/spherical;
- stalk/stem;
- pericarp/fruit wall/fleshy fruit;
- seeds present;
- AVP;

[max 2]

(c) Procedure: any **four** from:

- 1 equal sample of fruit;
- 2 crush fruit/chopping into small pieces;
- 3 Benedict's/Clinistix;
- 4 heating/boiling; (not warming)
- 5 same time for heating/look at same time;
- 6 comparison of colours/check colours/see which changes colour fastest; (pink to purple for clinistix)
- 7 AVP; (including same volume of Benedict's/water)

Safety: any **two** from:

- 8 safety glasses/goggles;
- 9 lab-coat (for protection);
- 10 test-tube holders or tongs
- 11 caustic chemicals/clear spillage/point away from people;
- 12 tie back hair (to prevent burning)/tuck in ties;
- 13 AVP;

*[ignore gloves/description of dangers  
if wrong reagent given, allow points 1 and 2 only plus safety points]*

[max 6]

**[Total: 17]**

<b>Page 5</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – May/June 2008</b>	<b>0610</b>	<b>6</b>

- 3 (a) (i) A** – stigma;
- B** – style;
- C** – ovule/embryo sac; R. ovary/ovum/egg/carpel [3]
- (ii)** correct path either side of the ovule, entering via the micropyle – either double or single line; [1]
- (b) (i)** pollen grain 4 – 5 mm diameter, and distance accept 50 – 90 – 120 mm; [1]
- (ii)** working:  
 path length ÷ pollen diameter  
 $x \div 4$  or  $x \div 5$   
 correct answer [to nearest whole number] ;; allow ecf  
*[this may need to be calculated several times for different figures]* [2]

**[Total: 7]**