

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

### **0610 BIOLOGY**

**0610/06**

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

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.

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- 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]

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- (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

Feature	Tomato	Apple
<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]

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(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]**

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- 3 (a) (i) A – stigma; [3]  
B – style;  
C – ovule/embryo sac; R. ovary/ovum/egg/carpel
- (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]