UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2007 question paper

0610 BIOLOGY

0610/02 Paper 2 (Core Theory), maximum raw mark 80

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International Examinations

1 (a) (i) leaf **B** – has parallel veins/veins not branched; [1]

(ii) organism **D** – has body divided into segments/rings/OWTTE; [1]

(iii) organism **E** – has four pairs of/eight legs/limbs ;
I - ref to cephalothorax (erroneous) [1]

(iv) organism **G** – has more than 4 pairs of legs/limbs/non-identical/varied

legs/limbs/2 regions to body/cephalothorax and abdomen;
I – refs to exoskeleton [1]

N.B. No letter given – no mark

(b) show division of 50/5;

(magnification) x10/times 10; R – 10mm
If no working then 2 marks for correct magnification
If wrong working can gain 1 mark for correct magnification
I – ratios [2]

[Total: 6]

2 (a) **A** = sepal/calyx;

B = anther/stamen; Accept – androecium [2]

(b) to receive/trap pollen/OWTTE; Accept – ref to male gamete [1]

(c) 1 no nectary (in wind pollinated flower);

2 smaller/less obvious petals (in wind pollinated flower);

3 stamens outside of petals/flowers (in wind pollinated flower);

4 stigma/style outside of petals/flowers (in wind pollinated flower);

5 feathery stigma (in wind pollinated flower);

any two – 1 mark each [2]

(d)	process	flowering plant	human
	fertilisation	√	√
	germination	√	
	implantation		√
	pollination	√	
	sexual intercourse		√

Each vertical column correct – 1 mark each [2]
I – crosses in other boxes

(e) (i) 1 dispersed by animals/mammals/birds/named examples; R – insects

2 red outer coat attracts them;

3 flesh encourages them to eat fruit;

4 seeds hard coats allow it to avoid digestion/discourage swallowing;

5 dispersal in faeces/dropped while removing flesh;

any three – 1 mark each [3]

(ii) 1 moisture/water/OWTTE;

2 with minerals/named mineral;

3 warm conditions/suitable/optimum temperature;

4 in light/not shaded area;

any three – 1 mark each [3]

[Total: 13]

3 (a) continuous (variation); [1]

(b) (i) plotted as four bars, all clearly identified (beneath or on bar);

accurate plotting (+/– half a square); [2]

(ii) genes/alleles/genotype/DNA/OWTTE; [1]

(c) (i) a change/alteration in a gene/allele/DNA/chromosome/chromosome number; [1]

(ii) chemical/named example/cigarette tar;

(gamma/beta/alpha/ionising) radiation;

X rays;

UV light;

any two – 1 mark each [2]

[Total: 7]

4 **(a)** **(i)** F; [1]

(ii) E; [1]

(iii) no tropical forest left/all destroyed; [1]

(iv) D; [1]

(b) **(i)** bacteria/fungi; [1]

(ii) carbon dioxide;

minerals/named mineral salt/ion; I – nutrients R – nitrogen (gas) [2]

(c) 1 crops take/use mineral salts from soil;

2 crop removed from land;

3 soil becomes infertile/low in mineral salts;

4 crop yield drops to worthless levels;

5 no fresh/replacement of humus/no recycling of materials;

6 crumb structure lost;

any three – 1 mark each [3]

[Total: 10]

5 **(a)** **(i)** carbon compounds in animals; [1]

(ii) **C**;

D;

E;

any two 1 mark each [2]

(iii) **B**; [1]

(iv) **A**; [1]

(b) **(i)** arrow labelled **P** parallel to **C** but in opposite direction/
linking boxes from air to plants around outside of diagram; [1]

(ii) carbon dioxide + water;

= glucose/(simple) sugar/starch + oxygen; [2]

I – ref to water on product side
A – correct formula as substitute for word
no need for equation to be balanced

[Total: 8]

6 (a) **A**;

D;

E; [3]

I – named parts

(b) root hair cell –

1 long extension/description to cell;

2 increase surface area (for absorption);

3 no chloroplasts/chlorophyll;

4 underground/hidden from light; [4]

I - ref to photosynthesis

reason must relate to difference

(c) **(i)** red blood cell –

1 has haemoglobin;

2 biconcave shape;

3 no nucleus;

any one – 1 mark [1]

(ii) 1 carries oxygen;

2 increases surface area for absorption/release of oxygen;

3 can hold greater amount of haemoglobin;

advantage must relate to difference

any one – 1 mark [1]

[Total: 9]

7 **(a)** a catalyst/chemical that alters/speeds up the rate of a reaction;

biological/made by cells/made of protein; [2]

A – biocatalyst as = biological catalyst

(b) suitable scales added to axes (uses more than half of the grid);

points plotted accurately (+/– half square);

points joined appropriately (from point to point or smooth curve of best fit); [3]

I – extrapolation back to zero

(c) stomach; [1]

(d) no reaction/rate of reaction 0;

boiling/high temperature would have denatured/destroyed enzyme; [2]

R – killed enzyme

[Total: 8]

8 **(a)** 1 iron for the formation of haemoglobin/red blood cells;

2 which carries oxygen;

3 vitamin D for absorption/deposition of calcium (ions);

4 calcium used in formation of bones/teeth;

any three – 1 mark each [3]

(b) constipation;

too little/lack of fibre/roughage in diet;

intestinal muscles lack bulk to push against;

obesity/excess overweight;

too much/more than needed carbohydrates/fats in diet;

excess stored as fat/adds to bulk of body;

coronary heart disease/heart attack/atherosclerosis;

too much (saturated) fat/cholesterol in diet;

causes blockages in coronary vessels/arteries;

any four from two effects only – 1 mark each [4]

accept other malnutrition effects e.g. nutritional marasmus, kwashiorkor, etc. and up to two explanatory points;

[Total: 7]

9 (a) 1 allows enzymes to work at constant rate;

2 allows constant rate of metabolism/reaction;

3 metabolism independent of (external) environment/OWTTE;

4 can live in many situations/example of extreme temperature conditions;

any two – 1 mark each [2]

(b) 1 (sweating) releases water onto skin;

2 (water/sweat) evaporates;

3 ref to latent heat/heat energy needed for evaporation;

4 reduces skin temperature/removes heat from blood;

5 increased (body) temperature – increased sweating;

6 prevents overheating/returns (body) temperature to normal/cools body;

any four – 1 mark each [4]

[Total: 6]

10 (a) (i) stomata/between guard cells; [1]

(ii) xylem (vessels); [1]

(b) (i) A;

(increased air movement) increases transpiration; [2]

(ii) C;

(rise less steeply) because of no air movement/(falls as) air is humid/saturated; [2]

[Total: 6]