

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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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) 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

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- (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]

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- 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; [1]
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]

Page 5	Mark Scheme	Syllabus	Paper
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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]

Page 6	Mark Scheme	Syllabus	Paper
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- 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]

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- 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/cooling 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]