

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**JUNE 2003**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK: 70**

**SYLLABUS/COMPONENT: 0610/02**

**BIOLOGY**  
**Paper 2 (Core)**



Page 1	Mark Scheme	Syllabus	Paper
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- 1 (a)** excretion;  
growth;  
movement; ignore - locomotion  
nutrition; ignore - feeding  
reproduction;  
sensitivity/irritability;  
Accept descriptions  
Any three – 1 mark each [3]
- (b)** put mud in muslin bag/equivalent – workable apparatus;  
suspend over limewater/calcium hydroxide solution/hydrogencarbonate/  
bicarbonate indicator;  
in sealed container;  
incubate/leave for 12+ hours;  
look for limewater to go cloudy/milky/white/hydrogen carbonate to go yellow;  
carbon dioxide released indicates respiration;  
reference to use of control;  
Apply pattern of mark scheme to alternative approaches  
e.g. release of heat from or use of oxygen for respiration.  
Credit annotated diagrams  
Any four – 1 mark each [4]
- Total [7]**

Page 2	Mark Scheme	Syllabus	Paper
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- 2 (a) (i) X – stigma/carpel;  
Y – anther/stamen; [2]
- (ii) small/insignificant “petals”/flowers “open”;  
do not prevent wind access to anthers/stigma/pollen;  
stamens/anthers hang outside of flower/petals;  
to release pollen into wind/air;  
stigma feathery;  
trap/filter pollen (from air);  
stigma hangs outside flower/petals;  
to catch pollen (in the wind);  
Any feature plus explanation – 1 mark each [2]
- (iii) no smell/scent;  
no bright colours of petals/flowers/coloured green;  
no nectar/nectary;  
inconspicuous shape/size of flower/petals;  
dry/dusty pollen;  
large quantities/smaller size pollen;  
Also features listed in (ii) above but **not** given  
in candidate’s response to (ii)  
Any two – 1 mark each [2]
- (b) (i) southwest; [1]
- (ii) most fruit found to north and east; apply error carried forward [1]
- (iii) distribution of fruit on branches;  
distribution of branches on tree;  
animals feed on/collect fruits from one region around tree;  
other valid biological suggestions; ignore - human intervention.  
Any one – 1 mark [1]
- Total [9]**

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3 (a) (i) C/(i) alongside a relevant arrow; [1]

(ii) D/(ii) alongside a relevant arrow; [1]

(iii) P/(iii) alongside a relevant arrow; [1]

(iv) R/(iv) alongside a relevant arrow; [1]

If in any section more than one label is given all of that label must be correct

(b) (i) less/no (trees/leaves) to photosynthesis;  
 more carbon dioxide in air/less removed from air;  
 no/less (leaves/wood) to decay;  
 Any two – 1 mark each [2]

(ii) less (leaves to) transpire/evaporation of water/evapotranspiration;  
 less roots/plants to absorb water (from deep layers);  
 less water v/water vapour in air/less rainfall;  
 Ignore - refs to floods/droughts/erosion/desertification.  
 Any two – 1 mark each [2]

**Total [8]**

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- 4 (a) (i) A** – nucleus/nuclear membrane;  
**B** – cytoplasm; [2]
- (ii)** label **C** clearly linked to a cell membrane in each cell; [1]
- (b) (i)** has cilia (on one surface/end of cell); ignore - hair  
to move mucus; reject - trap bacteria/dust, etc. [2]
- Credit valid references to goblet cells and function of producing mucus
- (ii)** has haemoglobin/no nucleus/biconcave;  
transport oxygen; [2]
- (c) (i)** movement of molecules/particles/ions;  
down concentration gradient/from higher to lower concentration; [2]
- (ii)** movement of water (molecules);  
across/through partially/semi/differentially/selectively  
permeable membrane. [2]
- Total [11]**

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5 (a) mitosis;  
diploid;  
meiosis;  
haploid;  
gametes; [5]

(b) use of correct symbols/**X** and **Y**;  
parent genotypes shown;  
gamete genotypes shown;  
offspring genotypes shown;  
phenotypes for both sexes identified.  
parent genotype wrong – max 3  
Any four – 1 mark each [4]

**Total [9]**

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- 6 (a)** top left box to 2<sup>nd</sup> right box;  
2<sup>nd</sup> left box to top right box;  
bottom left box to bottom right box; [3]
- (b) (i)** label to colon/large intestine; [1]
- (ii)** label to liver; reject - gall bladder [1]
- (iii)** label to liver; [1]
- (iv)** label to pancreas; reject - small intestine. [1]
- Total [7]**

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- 7 (a) **A** – refracts/bends light rays/lets light enter eye;  
ignore - protection
- B** – focuses light rays/image on to the retina/fovea;  
ignore - accommodation/change in shape
- C** – controls light entering (inner) eye/reaching retina/lens;  
ignore - change in pupil
- D** – changes light into/generates nerve/electrical impulses;  
ignore - signals unqualified/messages [4]
- (b) more/too much light enters/reaches retina;  
dazzles person/causes blurred vision/damages retina;  
ignore - double vision. [2]
- Total [6]**



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- 8 (a)** (translocation) is movement of soluble materials/sugars/amino acids;  
 from supply to demand/clearly identified example;  
 in phloem;  
 (transpiration) is diffusion/loss of water vapour/evaporation of water;  
 from leaves/through stomata to atmosphere;  
 down concentration gradient;  
 Any four – 1 mark each [4]
- (b)** leaves lose water;  
 water moves/passes/is drawn up/ref to transpiration stream;  
 up stem/leaf stalk;  
 through xylem/vessels;  
 (dye) dissolved/carried in water.  
 Any four – 1 mark each [4]
- Total [8]**

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- 9 (a) (i) light/sunlight (energy); ignore - solar [1]
- (ii) chemical (energy); ignore - potential [1]
- (b) (i) bacteria/fungi; ignore - decomposers/saprophytes [1]
- (ii) heat/thermal (energy); [1]
- (c) energy is not passed back to the sun/grass/producer/  
not recycled/OWTTE. [1]
- Total [5]**