

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

JUNE 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 40

SYLLABUS/COMPONENT: 0610/01

BIOLOGY
Paper 1 (Multiple Choice)



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	1

Question Number	Key	Question Number	Key
1	B	21	C
2	A	22	D
3	B	23	D
4	D	24	C
5	B	25	D
6	A	26	D
7	D	27	C
8	A	28	B
9	A	29	D
10	B	30	B
11	C	31	A
12	D	32	C
13	C	33	C
14	B	34	C
15	C	35	C
16	A	36	D
17	D	37	A
18	C	38	A
19	C	39	B
20	D	40	A

TOTAL 40

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
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

- 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
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

- 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]**

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

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]

Page 4	Mark Scheme	Syllabus	Paper
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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]**

Page 5	Mark Scheme	Syllabus	Paper
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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]

Page 6	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

- 6 (a)** top left box to 2nd right box;
2nd 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]**

Page 7	Mark Scheme	Syllabus	Paper
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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]**

Page 8	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

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]

Page 9	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	2

- 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]**

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INTERNATIONAL EXAMINATIONS

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INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 70

SYLLABUS/COMPONENT: 0610/03

BIOLOGY
Paper 3 (Extended)



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	3

1 (a) one mark for each part (drawn) and labelled correctly:

renal artery;
urethra;
ureter;

one mark for quality of drawing;

MAX. 2 FOR LABELLING "STUMPS" ONLY

4

(b) water;
urea; Allow nitrogenous waste
uric acid;
salts or minerals or named salts; Allow vitamins
hormones;
Reject 'waste products unqual./ions unqual.'

max. 3

(c) i. ref. to blood enters machine from patient AW;
(ONLY CREDIT ONCE)
ii. ref. to pump;
iii. blood passes along + dialysis tubing AW/visking tubing/cellulose
or cellophane tubing;
iv. ref. to tubing AW being semi-permeable/selectively permeable/
acting as a filter AW;
v. ref. to surrounding liquid;
vi. containing + some salts/glucose/no urea;
vii. ref. to fluid has same O. P. as blood;
viii. waste materials/excess materials + pass from blood;
ix. ref. to diffusion;
x. ref. to bubble trap/counter flow;
x. 'cleaned' blood returns + to patient's circulation/body AW;
(ONLY CREDIT ONCE)

max. 4

(d) (i) ref. to internal environment;
maintained (at constant level)/regulated/balanced;

2

(ii) ref. to maintaining level of named substance in blood;
method outlined, e.g. filtration/reabsorption/osmosis/diffusion;

2

(iii) suitable organ named;
named substance levels maintained;
ref. to mechanism for maintaining constant level;

3

max 18

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	3

- 2 (a) one mark for each column drawn and shaded correctly; 2
- (b) (i) 12 (%); 1
- (ii) AWARD 2 MARKS FOR CORRECT ANSWER, EVEN WITHOUT WORKING
 $50 + 12 + 13 + 6 + 7;$
 $= 88 (%);$ 2
- (c) **REJECT REF. TO FLUORINE ONCE in (i), (ii) or (iii)**
- (i) fluoride (in water) reduces (the number of) decayed teeth in children; 1
- (ii) add fluoride to the drinking water in town B;
advise children to use fluoride toothpaste;
use other suitable, named, source of fluoride; max 1
- (iii) i. ref. to side effects of too much fluoride, e.g. browning of tooth enamel or possible cancer risk;
ii. ref. to importance of personal choice/makes water impure;
iii. ref. to allergies to fluoride;
iv. ref. to cost of fluoridation;
v. ref. to treatment of whole population when not all benefit;
- Reject refs. to fluoride flavouring water/refs. to being bad for health/has side effects unqual. max 1
- max 8**

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	3

- 3 (a) involves giving the organism two names;
ref. to genus and species; 2
- (b) (i) *Caulerpa* grows at twice their rate AW;
ref. to competition (for light/CO₂/space for attachment/other plausible factor AW); Reject refs. to O₂ 2
- (ii) ref. to primary consumer/(organism) that feeds on plants/producers; 1
- (iii) ref. to disease/predation or shortage of + food/herbivores/sea urchins;
resulting in death/migration AW; 2
- (c) ref. to chlorine being + dangerous/poisonous/damaging to other organisms/a pollutant; 1
- (d) (i) i. ref. to possible effects on local food chains or food webs AW;
ii. ref. to destabilization of the ecosystem;
iii. ref. to extinction (of other organisms);
iv. ref. to local fishing industry;
v. ref. to importance of conservation;
vi. ref. to possible use of local species for medicines;
vii. ref. to effects on biodiversity; max 2
- (ii) ref. to its ability to feed on *Caulerpa*; Reject ref. to pest unqual.
reduces competition between *Caulerpa* and local seaweeds;
reduces population of *Caulerpa*;
allows other species to grow again; max 2
- (iii) i. it may eat other seaweeds as well;
ii. causing their extinction AW;
iii. ref. to no natural predators of the sea slug present AW;
iv. ref. to unbalancing + food chains/webs/ecosystem;
v. ref. to introduction of disease; max 2
- max 14**

Page 4	Mark Scheme	Syllabus	Paper
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- 4 (a) (i) (SIMILARITIES)**
- i. ref. to exoskeleton;
 - ii. ref. to jointed limbs AW;
 - iii. no backbone/ref. to invertebrate;
 - iv. both have segmented body;
 - v. both members of the arthropod group;
- Accept ref. to stages of development, e.g. ecdysis/instars **max 3**

- (ii) (DIFFERENCES)**
1 MARK FOR TABLE, MAX. 4 FOR DIFFERENCES
- i. table format with suitable headings;
 - ii. insects have 3 pairs of legs + arachnids have 4 pairs;
 - iii. insects have wings + arachnids do not; Allow refs to ability to fly
 - iv. insects have antennae + arachnids do not;
 - v. insects have compound eyes + arachnids do not/ref. to simple eyes;
 - vi. insects have 3 parts to the body + arachnids have 2 parts;
 - vii. arachnids have chelicerae/pincer-like jaws + insects do not;
 - viii. arachnids spin webs + insects do not; Allow insects can be social + arachnids are not AW;
- max 5**

- (b)**
- i. named insect;
 - ii. ref. to variation AW;
 - iii. due to sexual reproduction/mating;
 - iv. ref. to mutation;
 - v. variation/mutation + leads to differential survival AW;
 - vi. suggestion for environmental change, e.g. temperature, food available;
 - vii. suggested change to insect, e.g. thicker cuticle, larger wings;
 - viii. ref. to benefit of change to the organism;
 - ix. ref. to survival of fittest/natural selection;
 - x. favoured genes passed on to next generation AW;
- max 7**

max 15

Page 5	Mark Scheme	Syllabus	Paper
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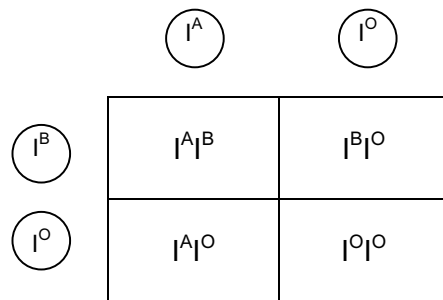
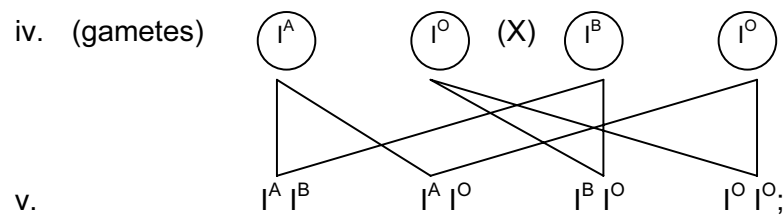
- 5 (a) ACCEPT OTHER PLAUSIBLE ANSWERS**
- i. ref. to unsuitable climate/temperature/rainfall/ref. to pollution;
 - ii. ref. to natural disasters, e.g. flooding/drought;
 - iii. water used for other purposes/diversion of rivers/building dams/poor irrigation;
 - iv. so plants are killed/poor germination/no food for animals; (linked to i. or ii. or iii.)
 - v. next year's seeds eaten through need for food;
 - vi. poor soil/lack of inorganic ions or fertiliser;
 - vii. so plants do not grow well; (linked to vi.)
 - viii. ref. to desertification/poor or thin soil;
 - ix. due to + deforestation/slash and burn; (linked to viii.)
 - x. ref. to lack of money + to buy seeds/fertiliser/pesticides/machinery/import food;
 - xi. ref. to war/farm redistribution;
 - xii. so there is no-one to harvest crops/too dangerous to tend crops/no experienced farmers AW; (linked to xi.)
 - xiii. ref. to urbanisation AW;
 - xiv. so there are fewer people to work the land/less land to grow crops on; (linked to xiii.)
 - xv. ref. to increasing population requiring food;
 - xvi. ref. to growth of + cash crops/monoculture/food for export (not suitable for local diet);
 - xvii. ref. to selling of food reserves to + settle national debt/maintain economy;
 - xviii. ref. to pest damage/disease (in crops or stored food);
 - xix. heat causes fresh produce to rot quickly AW;
 - xx. lack of suitable land to farm/ref. to overgrazing;
 - xxi. farmers poorly educated;
 - xxii. forests destroyed + so nothing to hunt/no food to collect;
 - xxiii. ref. to outmoded farm practices;
 - xxiv. ref. to poor transport/distribution;
- max 10**
- (b)**
- i. ref. to auxin;
 - ii. sprayed onto e.g. tomato flowers to induce fruit production;
 - iii. happens even if pollination has not occurred;
 - iv. ref. to use of auxins in + weedkiller/herbicide;
 - v. so crops have less competition;
 - vi. ref. to effect (only) on broad leaved plants (so monocot crops unaffected);
 - vii. ref. to use of hormones (e.g. cytokinin) in tissue culture;
 - viii. to promote root and shoot formation/form a callus;
 - ix. ref. to BST (bovine somatotropin);
 - x. used with cattle to increase milk production (linked to ix)
 - xi. ref. to growth hormone/testosterone;
 - xii. used to increase meat production;
 - xiii. ref. to production of seedless fruit;
 - xiv. ref. to promotion of seed germination;
 - xv. ref. to production of short plants (to resist wind damage);
 - xvi. ref. to delaying fruit production/ripening;
 - xvii. ref. to increasing fruit yield AW;
- max 5**

max 15

- 6 (a) i. ref. to a pair of alleles; Reject gene ref. once
 ii. in which one is not dominant over the other AW;
 Reject both dominant; Allow both equally dominant
 iii. so both alleles have an effect in phenotype/heterozygous organism AW; 3

(b) ACCEPT PUNNETT SQUARE
 IF LINES ARE USED TO LINK GAMETES AND F1, THEY **MUST** BE CORRECT

- i. mother = $I^A I^O$; Allow AO, $I^A i$
 ii. father = $I^B I^O$;
 iii. (parents) $I^A I^O$ X $I^B I^O$;



- vi. $I^O I^O$ = baby with blood group; 6

- (c) (i) i. blood may + clump/clot/coagulate/agglutinate;
 ii. due to presence of antigens on (the surface of) blood cells;
 iii. and different antibodies present in other blood AW;
 iv. ref. to no clumping if donor blood group is group O; max 3
- (ii) i. placenta keeps the blood of mother and fetus separate AW;
 ii. since the blood types could be different AW;
 iii. but allows exchange of materials between mother and fetus AW; 3

max 15

Page 7	Mark Scheme	Syllabus	Paper
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7 (a) MARK FIRST FIVE PARTS AND FUNCTIONS GIVEN ANY FIVE FROM:

- i. penis + to insert sperm/semen + into vagina AW/ref. to erectile tissue;
- ii. urethra + to pass sperm/semen + through penis;
Allow ref. to penis/ urethra + urine once;
- iii. testis + to make sperm/testosterone;
- iv. vas deferens/sperm duct + pass sperm from testis to urethra;
- v. epididymis + to store/mature/move + sperm;
- vi. scrotum + contain testes/to keep testes at lower temperature than that of body AW;
- vii. prostate gland/seminal vesicles/cowper's gland + to produce seminal fluid AW;

5

- (b) (i)
- i. ref. to swimming;
 - ii. using tail;
 - iii. ref. to passing through cervix;
 - iv. ref. to passing through uterus/womb;
 - v. enter an oviduct/fallopian tube;
 - vi. ref. to chemical sensor AW;
 - vii. ref. to mitochondria + energy;

max 4

- (ii)
- i. ref. to zona pellucida;
 - ii. sperm penetrates egg membrane;
 - iii. ref. to use of enzymes/acrosome;
 - iv. head of sperm enters egg;
 - v. sperm nucleus and egg nucleus fuse;
 - vi. ref. to formation of zygote;

max 3

- (c)
- i. ref. to use of condom/femidom (during sexual intercourse);
 - ii. ref. to abstinence from sexual intercourse;
 - iii. ref. to screening of blood for transfusions/blood checked for HIV;
 - iv. ref. to use of sterile needles (for injecting drugs)/don't share needles;
Reject refs to clean needles;
 - v. ref. to maintaining one partner/not sleeping around;
 - vi. ref. to health education;
 - vii. avoiding contact with blood + example;

max 3

max 15

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

JUNE 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 40

SYLLABUS/COMPONENT: 0610/05

**BIOLOGY
(Practical)**



Page 1	Mark Scheme	Syllabus	Paper
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- 1 (a)** * lose if ***no table***;
- * use of ruled lines for columns and rows;
- * time (table heading);
- * height/level/measurement (table heading);
- record of units mm/cm and min/(A) clock times;
- readings taken at 5 min intervals;
- records for both sets of dough S1 and S2;
- manipulation of data/recording increase or differences;
- max 5**
- (b)** * *lose if bar chart*
- orientation of axes; (time horizontal, height vertical)
- labels for axes including units; **(A) clock times**
- plotting data using suitable scale; **c. half the paper min.**
- * plotting data for S1 (points visible, no obvious error, not (0,0));
- * plotting data for S2 (points visible, no obvious error, not (0,0));
- * clear lines;
- each curve identified/use of key;
- max 6**
- (c)** curve for S1 rises (with time);
- comment on rate of increase; **suitable qualification**
- curve for S2 does not rise;
- Look at candidate's graph. If not as expected, apply scheme as S1 trend, S2 trend and suitable comment on rate of increase***

3

Page 2	Mark Scheme	Syllabus	Paper
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- (d) yeast is, living organism/fungus;
 respiration;
 without oxygen/anaerobic/fermentation;
 sugar source of, food/nutrition/energy/substrate;
 equation (for anaerobic respiration);
 carbon dioxide evolved;
 trapped/bubbles (remain in dough);
 causes dough to rise;
 rise stops as sugar runs out;
 rise stops as yeast killed by alcohol;
 dough sinks and valid explanation.

max 6

Total: 20

- 2 (a) (i) purple/mauve/lilac; ***reject precipitate/dark purple***
 (protein) present;

2

- (ii) add, sodium/potassium, hydroxide (solution);
 then (a few drops) copper sulphate (solution);

2

- (b) (i) Drawing – clear outline S4;
 at least 5 cm in one direction;
 main shell (if present)/pattern on dorsal surface (if shell absent);
 foot/other soft parts, shown;
use label to help you identify presence of soft parts if drawing unclear or if snail in shell

Page 3	Mark Scheme	Syllabus	Paper
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Labels – shell/dorsal surface pattern; **reject exoskeleton alone**
any soft part; **(A) soft body reject eyes alone**

6

- (ii) length of drawing measured correctly (± 2 mm);
correct calculation of "drawing length \div specimen length"; **(1 d.p.)**
ratio needs to be labelled

2

- (c) *Candidates may use snails "as they are" in this beaker or remove some/all of them. Apply scheme to any sensible plan.*

use, thermometer/temperature probe;

place thermometer in contact with soft part of snail to record body temp.;

record temp. of surrounding air; **(A) area reject earth**

repeats; **(A) several snails**

investigate at different temps.;

leave snails to adjust to surroundings before measuring; **(A) time ref.**

idea of fair test; (e.g. same procedure when investigating at different temps.; leave same time interval between measurements; use same number of snails; other detail of fair test) **reject control**

max 3

- (d) (i) hard/rigid;
colour/pattern;
contrast between inside and outside;
shape; **(A) like**
hollow;
opening;
texture; **(A) smooth qualified**
dimensions;

max 2

Page 4	Mark Scheme	Syllabus	Paper
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(ii) effervescence/fizzing/AW;

shell is made of calcium carbonate;

2

(iii) support/protection ((**A**) *shelter*)/camouflage/muscle attachment;

1

Total: 20

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MARK SCHEME

MAXIMUM MARK: 40

SYLLABUS/COMPONENT: 0610/06

BIOLOGY
(Alternative to Practical)



Page 1	Mark Scheme	Syllabus	Paper
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1 (a) Two from:

temperature or warmth or heat/[same type of] [amount of] yeast/type of flour/same size measuring cylinder/same mass or weight of dough/[same quantity of] [type of] sugar [2]

(ignore water [in q], amount of ingredients, pH, light, carbon dioxide, time, humidity, reading at eye level, cold)

(b) (i) Graph:

O orientation of axes and label of axes plus units;

S use of appropriate and even scale to fill half of the grid;

P plotting data A; B; C;

K key for separate date; max [5]

(ii) Line A - rises steadily;

Line B - does not rise/rises slightly/at a constant level;

Line C - rises and flattens; [2 stages] [3]

(iii) 80; [1]

(iv) Two from:

1. comment on **volume difference**, A more;

2. A has yeast [and B has none];

3. correct ref. to production of carbon dioxide; [2]

(v) Two from:

1. comment on **rate difference**/speeding up/faster;

2. substance X present in C [A has no X];

3. reasonable suggestion for role of substance X;

(accept enzyme, catalyst, improver, AW) [2]

Total 15

Page 2	Mark Scheme	Syllabus	Paper
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2 (a) 2 conditions = 1 mark. No ½ marks.

warmth [correct/suitable temperature/10 to 30°C if specified];

oxygen;

but apply **ecf** for part **(b)**

[1]

(b) Three from:

1. identification of **one** workable condition **from (a)** for investigation - two sets one **with** and one **without**;

2. idea of sample size many seeds, a few seeds must be more than one seed for repetition idea;

3. some common factor of treatment between the two sets [with and without the condition] under investigation;
(equal watering, equal number of seeds, same species AW)

4. left to grow for same time period;

(if stated minimum 1 + days, accept up to 3 weeks)

max [3]

Total 4

Page 3	Mark Scheme	Syllabus	Paper
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3 (a) (i) Drawing:

clear outline;

correct proportions;

Labels – 2 from:

Tentacles;

eye [to be located at the end of the larger tentacles];

foot [qualified];

shell [dorsal/visceral shell or hump];

unsegmented body;

(ignore reference to negative features) [4]

(ii) Magnification:

Check measurements given are those transcribed into the formula -
drawing size;
 actual size

calculation is correct stated asx 1+
 (this must be more than 1 if drawings is as large as fig 3.1) max [2]

(iii) Similarity – one from:

both have tentacles/eyes/same head/shell;

Difference – one from:

A has no large external shell and B has/shell has different
 shape or comment on shape; AW [2]

(iv) mollusc: [1]

Total: 9

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0610	6

- 4 (a) (i)** introduce a glowing splint/spill
(do not award for match will burn/candles lighting/splints that are already burning)
- addition of pyrogallol; [1]
- (ii)** photosynthesis; [1]
- (iii)** 10 cm³;
10 ÷ 5 = 2cm³; [2]
- (iv) Two from**, for design of experiment:
- method for setting up different light intensities;
(bright light in introduction - so maybe dimmer or less light but must have detail of how this is to be achieved/distances away from light bulb/AW)
 - describe how to control a factor that may alter rate over a certain time
(temperature - heat shield, carbon dioxide by adding hydrogen carbonate/AW)
 - additional feature of design –
(same time period for comparison of results/eliminate background light, carry out investigation in a darkened room/replicates/ repetition/same piece of pondweed/recovery time between sets of measurements AW) max [2]

(b)

	Colour	Explanation
(i)	purple [1]	carbon dioxide used up/ photosynthesis [1]
(ii)	red/orange [1]	balance [between photosynthesis and respiration] [1]
(iii)	yellow [1]	respiration of 3 water shrimps/ produce carbon dioxide [1]

Total: 12

Grade thresholds taken for Syllabus 0610 (Biology) in the June 2003 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	40	-	29	24	20
Component 2	70	-	37	25	19
Component 3	70	48	33	-	-
Component 5	40	35	29	22	20
Component 6	40	32	24	18	15

The threshold (minimum mark) for B is set halfway between those for Grades A and C.

The threshold (minimum mark) for D is set halfway between those for Grades C and E.

The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grade A* does not exist at the level of an individual component.