

NOVMEBER 2003

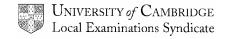
INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 40

SYLLABUS/COMPONENT: 0610/06

BIOLOGY (Alternative to Practical)



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Question 1

(a) (i) Graph

O - axes to show correct orientation;

S - suitable scale to fill the printed grid; [at 10 mins scale should cover 2½ large squares]

label axes correctly with appropriate unit;

P + P - correct plotting [minus 1 for 1 error, minus 2 for 2 errors]

ruled straight lines from point to point / smooth line of best fit [R. wavy lines. No extrapolation back to axes. Allow extra line past 10 min for label line]

K - identify lines by labels or use of a key;

Histogram allow L, O, K to max 3.

[7]

(ii) temperature drops faster at first / AW;

temperature continues to drop but slower / AW;

but if A loses heat with no further detail, max 1 mark no credit for a description comparing A with B and C

[2]

[2]

(iii) reference to one tube having dropped more / lower / faster than another; A compared with B / A compared with C / B compared with C; (if just final temperatures given with no working = 0)

(iv) reference to animals or tubes *with idea of* transfer of heat/trap warm air/keep them warm /maintain body temperature;

use of appropriate scientific term – insulation/conduction/radiation/convection;

(b) shield tubes from draughts/move apparatus out of draught; use of lids [to reduce loss of heat from too exposed surface]; stir the water before taking temperature reading; replication/average/ accept measure more tubes in outer ring C; more frequent readings; [ignore longer periods]

R. leave longer/use more test tubes or larger groups/use of animals or blood instead of water/lagging tubes/alter volume of water.

MAX [2]

[Total: 15]

Question 2

(a) (i) **Drawing: clear outline of whole animal;** R sketchy outlines and excessive

artistic shading

proportions; R. obvious gross errors/extra detail not present

e.g. open carapace

detail; check 3 parts to body and 3 pairs of segmented legs.

Labels: number and structure for 1 mark

6 legs/3 pairs/6 jointed appendages; 2 antennae/feelers; R. *anthers/tentacles*;

3 parts to body / head and thorax and abdomen;

R. segmented body alone

2 pairs of wings (accept 1 pair of wings / wing covers)

ignore mouthparts/carpace/hard case.

MAX [5]

(ii) measurement of Fig 2.1 3 to 4.2 cm max. AND

working to calculate magnification;

magnification;

check answer, must be times or x in front of figure without units.

if answer is incorrect look for correct working accept a ratio if correct

[3]

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(b) **TWO** precautions and explanations from:-

traps must be checked early and regularly; so animals do not become eaten/escape;

use of suitable fluid;

to kill the insects/to stop carnivorous insects/predators/large animals eating beetles;

suitable covering/mesh; animals washed away/eaten; rain;

container deep enough/grease sides of pit; so beetles cannot escape/trap insects;

R. bait/food to attract insects/identification of insects/exit holes for rain/glass pits/position of pits/gap around tin/sharp edge/use of gloves.

MAX [4]

(c) THREE visible differences between beetle in Fig. 2.1 and the butterfly in Fig. 2.3

Need points from **both** insects to be compared – statements MUST be paired.

Feature	Beetle fig 2.1	Butterfly fig 2.3
wings	one pair /	2 pairs of wings [alone] /
	no wings /	bigger / visible wings /
	folded wings	unfolded / upright wings;
wing covers	present	wings exposed / absent;
antennae (accept ecf for	shorter / smaller /	longer / larger /
incorrect name already penalised)	no swellings /	swellings at tip /
, , , , , , , , , , , , , , , , , , ,	segmented	not segmented;
mouthparts	pincers / claws /	proboscis / tongue /
	piercing parts / AW	sucking;
eyes	none / not visible / small	compound / visible / large;
	R. simple eyes	
body	accept small	accept large;
abdomen	not visible (accept not segmente segments not visible)	visible / segmented;
		R. striped/shaded
legs	hairy / claws	not hairy / no claws;
	R. length of legs	

MAX [3]

[Total: 15]

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Question 3

(a) Award 1 + 1 mark in pairs (i.e. second mark can only be awarded with its own first mark) ONE of:-

Cover with petroleum jelly;...... Plant will not wilt;

Cover with polythene bag/bell jar/bottle;..... condensation/drops of water will collect; R. water vapour

Use of photometer;..... bubble movement/level of capillary water;

Shoot in container;...... water taken up; [needs for water to be covered with oil to prevent evaporation/covered with polythene].

Cobalt chloride paper; colour change – to pink;

Anhydrous copper sulphate...colour change – to blue; *R. litmus/universal indicator* [2]

(b) to prevent / minimise loss of moisture / water from the soil / pot by evaporation; [1]

(c) similar apparatus including same sized/mass plants/equal number of leaves; *ignore ref. to same bags*

same conditions of water added before starting investigation;

same time for readings/one day;

same conditions of light;

same temperature;

same humidity;

same air movement;

data analysis/comparison of graphs;

if candidate describes a different experiment, then max 2 for 2 controlled conditions

MAX [4]

(d)

feature	description	comment relating to adaptation
leaves	no leaves / small leaves / small surface area / spines / thorns;	to reduce water loss / transpiration; for protection / to prevent being grazed / eaten;
stem (R. bulb)	hairs [or stem or plant]; swollen / thick / fleshy / succulent; green / ref. chlorophyll;	to trap water; stores water; for photosynthesis [as leaf area reduced];
cuticle / skin	thick/waxy; R. hard alone	stops water loss;
roots	long / tap; shallow / network / fibrous / many roots;	to trap / absorb water from deep; to trap/absorb water over wide area; R. store water
hairs/spines	on stem / plant / surface;	traps moist air; reduce transpiration;
stomata	not in direct light / sunken / less in number;	reduce water loss / reduce transpiration;
plant shape	width / thickness / less surface area to volume ratio / reduce surface area; ignore compact	stores water / reduce water loss;

³ valid features without adaptation comment = max 1

R. big roots / main root / light reflecting / shiny / ribs / grooves

MAX [3]

[Total: 10]