



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2004

GCE

Biology B

Unit BYB5/W

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Guidance on the award of the mark for Quality of Written Communication

Quality of Written Communication assessment requires candidates to:

- select and use a form and style of writing appropriate to purpose and complex subject matter;
- organise relevant information clearly and coherently, using specialist vocabulary when appropriate; and
- ensure text is legible, and spelling, grammar and punctuation are accurate, so that meaning is clear.

For a candidate to be awarded 1 mark for quality of written communication on the question identified as assessing QWC in a unit test, the minimum acceptable standard of performance should be:

- the longer parts (worth 4 marks or more) should be structured in a reasonably logical way, appropriate and relevant to the question asked;
- ideas and concepts should be explained sufficiently clearly to be readily understood. Continuous prose should be used and sentences should be generally be complete and constructed grammatically. However, minor errors of punctuation or style should not disqualify;
- appropriate AS/A level terminology should be used. Candidates should not use such phrases as ‘fighting disease’, ‘messages passing along nerves’, ‘enzymes being killed’ etc, but a single lapse would not necessarily disqualify. Technical terms should be spelled correctly, especially where confusion might occur, e.g. mitosis/meiosis, glycogen/glucagon.

The Quality of Written Communication mark is intended as a recognition of competence in written English. Award of the mark should be based on overall impression of performance on the question identified on the paper as assessing QWC. Perfection is not required, and typical slips resulting from exam pressure such as ‘of’ for ‘off’ should not be penalised. Good performance in one area may outweigh poorer performance in another. Care should be taken not to disqualify candidates whose lack of knowledge relating to certain parts of a question hampers their ability to write a clear and coherent answer; in such cases positive achievement on other questions might still be creditworthy. No allowance should be made in the award of this mark for candidates who appear to suffer from dyslexia or for whom English is a second language. Other procedures will be used by the Board for such candidates.

Examiners should record 1 or 0 at the end of the paper in the Quality of Written Communication lozenge. This mark should then be transferred to the designated box on the cover of the script.

Question 1

- (a) *two of: temperature, water (content of soil)/rainfall (allow humidity)/ compacted soil (reject pH, light or oxygen);* 2
- (b) (i) burrow deeper into soil;
- (ii) idea of avoiding drying out (*reject predators*); 2
- (d) aerates the soil / increases availability of oxygen for (aerobic) respiration;
breaks up organic material;
increases surface area for action by microorganisms;
OR
idea of increasing organic content of soil;
more food for microbes; 2
(*points must be linked*)

Total 5

Question 2

- (a) (i) herbivore = $\frac{11 - 12}{24 - 26} \times 100 = 42.3 - 50\%$
carnivore = $\frac{6}{24 - 26} \times 100 = 23 - 25\%$
(*correct method measurement = 1 mark*)
total
(*correct answer = 2 marks*) 2
- (ii) cellulose present in faeces;
cellulose/much of food indigestible;
indigestible material contains energy; 2 max
- (b) (smaller mammals) have a larger SA:V ratio;
so lose more heat (*linked to size*);
maintains body temperature (*linked to higher rate of respiration*); 2 max

Total 6

Question 3

- (a) pesticide not biodegradable/broken down;
stored in tissues/fat;
persists in food chain/bioaccumulation/biomagnification;
animals higher up the food chain eating larger numbers of organisms
lower down; 3 max

- (b) mutation produced (allele/gene for) resistance;
(reject mutation as a result of pesticide)
 variation within insect population /
 some insects able to survive application;
 reproduce;
 pass on alleles/genes; 3
- (c) pesticide is lipid soluble;
 membranes contain lipid/phospholipid;
 OR
 pesticide fits into receptors/proteins on membrane;
 passes through carrier proteins/facilitated diffusion /active transport;
(points must be linked) 2
- Total 8
-

Question 4

- (a) (i) idea of rise and fall;
 peak and trough later than those of larvae/idea of time lag;
(allow correct line drawn on the graph) 2
- (ii) reduction in leaf area/size decreases photosynthesis;
 less food reserves available for production of new needles;
 OR
 feeding larvae damage more growing points;
 takes time for tree to recover/ less growing time for needles; 2
- (b) smaller surface area;
 reduces water loss; 2
- Total 6
-

Question 5

- (a) carbon dioxide taken in as a result of photosynthesis / more
 photosynthesis than respiration;
 idea that carbon is fixed/incorporated into compounds in the
 trees; *(reject sugar)* 2
- (b) $\frac{3800}{180-184} = 20.65 - 21.1$ *(allow 20.7 to 20.11 but disqualify 20.6)*
(correct method of calculation = 1 mark)
(correct answer = 2 marks) 2

(c)	extracellular digestion; by secretion of enzymes; absorption of digested/soluble products; synthesis of structural compounds/named compound; respiration provide energy for growth;	4 max
(d)	higher temperatures, increasing enzyme action/decay / microorganism activity;	1
	Total	9

Question 6

(a)	random sampling method; use of large numbers/many/10 or more quadrats in each area; counting daisies and dividing by area;	3
(b)	the cutting has no effect;	1
(c)	daisy, dandelion, buttercup show (statistically) significant differences; no significant effect on plantains; comment on relative significance of daisy/dandelion/buttercup; regular cutting linked to significant increase in density of daisy/dandelion; linked to significant decrease in density of buttercup; <i>(no marks if significance idea omitted)</i>	3 max
(d)	2 × suitable adaptation plus explanation e.g. flattened leaves/ plant grows close to ground; so <u>not</u> damaged during mowing; OR able to regenerate/repair damaged leaves/quick growing; quick recovery after action by mower; OR grows from the base not the tips; growing point not affected; OR rapid seed production; dispersed between cuttings;	(any two) 4
	Total	11

SECTION B**Question 7**

- | | | |
|--------------|--|-----------|
| (a) | run off/leaching of nutrients/nitrates;
leads to increased growth of algae/plants;
competition for light / effect of competition;
death of algae/plants;
increases food supply / increases microorganisms/decomposers;
respiration (of microorganisms) uses up oxygen/increases BOD;
fish/animals die due to lack of oxygen; | 5 |
| (b) | leads to soil erosion;
increase in run off carries more fertilisers;
soil (+ fertilisers) blown into lake;
fewer nutrients taken up by the hedges; | 2 max |
| (c) | amino acids in food;
deaminated (<i>sensible reference</i>);
to form urea;
excreted by kidney; | 4 |
| Total | | 11 |
-

Question 8

- | | | |
|-----|--|-------|
| (a) | (i) tips colonised by short-lived plants / short lived plants are pioneers;
short-lived plants fast growing/spreading/distribute seeds quickly;
short-lived plants change the environment e.g. make conditions more favourable for long-lived plants;
valid reference to competition; | |
| | (ii) long-lived plants compete with each other;
death of some long-lived plants;
more niches / leaving spaces/areas for growth of short-lived plants;
short-lived plants recolonise; | 6 max |

(b)	<p>control of named variable e.g. light, water-content, nutrients; large numbers of both species/10+ individuals; range of different concentrations of zinc; valid measurement of growth, height/leaf area/root growth/numbers/mass/ % germination; statistical analysis/correlation between the two sets of data; OR large number of samples taken (in the field); principle of determining zinc concentration of soil; valid measurement of growth, height/leaf area/root growth/numbers/ mass/% germination; statistical analysis/correlation between the two sets of data;</p>	3 max
	Total	9
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QWC (See Guidance)		1