



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2004

GCE

Biology B

Unit BYB6/A

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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) angle, moisture and pH (*all required*); 1
- (b) system for subdividing quadrat into, e.g. many squares;
method of estimating cover in small squares, e.g. counting those where
cover over 50%, or cover at points (of intersection); 2
(*not just 'count squares with vegetation' unless very small*)
- (c) increasing vegetation cover is related to increasing moisture content
(*allow 'affects' moisture content or vice versa, not 'causes'*);
correlation is significant / not due to chance / can reject null
hypothesis; 2 max
only 1 in 20/5% probability that the correlation is due to chance;
- (d) factor; and linked effect e.g.
wind-blown particles trapped;
accumulation of soil;
OR
accumulation of organic/dead/decomposed matter/humus;
increase in mineral ions / improved water retention / improved soil
structure;
OR
nitrogen fixation;
increased nitrate concentration / improved soil fertility; 2 max
- Total 7
-

Question 2

- (a) rate of photosynthesis increased;
normal atmospheric concentration a limiting factor;
more/faster production of biomass or sugars / more products of
photosynthesis transported to fruits; 2 max
- (b) (increased temperature) increases rate of respiration;
rate of photosynthesis too low to replace respiratory loss 2
- (c) lower water potential of nutrient solution;
less water absorbed into roots (by osmosis); 2
(*not: water lost from roots*)
- Total 6
-

Question 3

- (a) faster rate of growth;
reduced movement / lower respiratory losses;
more sustained/plentiful food supply;
high survival rate, e.g. due to protection from predators;
reduced fishing effort; 2 max
- (b) activity of decomposers / microorganisms;
reduced oxygen content;
few species adapted to low oxygen conditions; 2 max
- (c) not all fishmeal digestible / consumed;
used in respiration for movement / other valid use;
synthesis of biomass inefficient / involves energy or heat loss; 2 max
- Total 6
-

Question 4

- (a) 250 1
- (b) grebes eat many fish;
accumulation of many doses;
insecticide not excreted / not biodegradable / remains in fat stores; 2 max
- (c) (i) concentration which kills 50% / a certain percentage; 1
- (ii) alter tertiary structure of proteins;
disrupt enzyme activity;
detail described, e.g. non-competitive inhibition / change to active site;
reference to nerve or brain damage, or kidney failure; 3 max
- Total 7
-

Question 5

- (a) transported through whole plant; 1
- (b) (i) presence of -COOH group; 1
- (ii) similar structure so fit same protein/receptors; 1

- (c) 2,4-D adds to effect of IAA (already present) / affects all cells;
stimulates growth in parts other than growing points / stimulates
uncontrolled growth / makes walls of cells stretch too much /
makes growth outstrip nutrient availability; 2
- Total 5
-

Question 6

- (a) (i) rounded shape / small head / short legs / small extremities;
low surface area:volume ratio limits heat loss; 2
- (ii) insulation / physical responses prevent heat loss/maintain
temperature above -10°C ;
below -10°C heat loss greater than heat gain from respiration;
rate of respiration/metabolism increased to generate heat; 2 max
- (b) (i) reduction in exposed surface area so less heat loss;
(not just: use or gain heat from each other)
less fat / food store used in maintaining temperature; 2
- (ii) figures used to calculate mass of fat used:
for birds that do not huddle (e.g. walking uses $100 \times 7.5 =$
 750 g (0.75 kg) and 100 days on ice uses $20\text{ kg} = 20.75\text{ kg}$);
for birds that huddle only 10.75 kg used;
all stored fat used in 100 days if not in huddle / insufficient
fat reserve for single birds to return to sea; 3
- Total 9
-

Question 7

- (a) 10 (*reject: 9.76*) 1
- (b) isolation (on islands);
variety of habitats / conditions different from origin/other islands;
differing pathways of natural selection;
leading to organisms too different to interbreed. 3 max

- (c)
1. protection of habitat;
 2. legal measures, e.g. quotas, hunting bans;
 3. capture/culling of non-native species;
 4. captive breeding;
 5. surrogacy / artificial insemination / genetic manipulation techniques;
 6. ethical / aesthetic reasons for conservation / tourism;
 7. possible undiscovered benefits, e.g. crop plants, drug sources;
 8. maintaining genetic diversity for future breeding programmes;
 9. avoid damage to food webs / control local pests;
- (max 4 for either ways or reasons)*
- 6 max

Total 10
