



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

January 2003

GCE

Biology B

Unit BYB5/W

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Guidance on the award of the mark for Quality of Written Communication on Section B of Unit Tests

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 Section B 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 Section B. 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 Section B in the Quality of Written Communication lozenge. This mark should then be transferred to the designated box on the cover of the script.

Unit 5: Environment

Question 1

- | | | |
|--------|---|---|
| (a) | (all) the individuals of one species (in an area); | 1 |
| (b) | (S.D. is a measure of) the spread around the mean;
Population B lengths have wider/more evenly spread range; | 2 |
| (c) | Relevant named abiotic factor;
Effect on growth;
e.g. light;
products of photosynthesis linked to growth/high light intensity inhibits growth;
temperature;
higher temperature increases rates of reaction;
nitrate concentration;
nitrates used for more protein synthesis; | 2 |
| (d)(i) | <u>Several</u> genes/alleles involved (each with small effect); | 1 |
| (ii) | Different frequencies of <u>alleles</u> / selection of different <u>alleles</u> ; | 1 |
| | Total | 7 |

Question 2

- | | | |
|---------|---|-------|
| (a) (i) | Correct answer given as a ratio (1000:1) = 2 marks;;
Principle– graph readings 950 and 0.95 <i>or</i> principle of division = 1mark | 2 |
| (ii) | Respiration/energy loss/heat loss between trophic levels;
Only some of energy in hare biomass converted to predator biomass,
e.g. energy used by predators to catch hares;
Only some of the energy in hare biomass passed on, e.g. not all parts edible; | 2 max |
| (b) (i) | Predator numbers initially constant before increasing/increase after delay;
Slower rate of increase/decrease;
Plateau, rather than peak; | 2 max |
| (ii) | Influence of food supply, e.g. increase as shrubs increase;
Influence of predators;
Influence of shrubs becoming toxic, so numbers decrease; | 3 |
| | Total | 9 |

Question 3

- | | | |
|-----|---|-------|
| (a) | 8– 24°C (<i>accept 7.5 to 8.4 and 23.5 to 24.4</i>); | 1 |
| (b) | Photosynthesis rate only just above respiration rate;
Little gain in biomass <i>or</i> net loss in biomass due to (night-time) respiration;
No excess production for storage in tubers; | 2 max |
| (c) | Optimum for enzymes exceeded/ enzymes denatured;
<u>Light independent</u> reaction disrupted; | 2 |
| (d) | Suitable instrument – e.g. thermistor/diode probe/soil thermometer;
Practical detail of use e.g. consistent depth of readings/bulb at level of tubers; | 1 |
| | Regular <i>or</i> standardised measurements/data logger; | 1 |
| | Total | 7 |
-

Question 4

- | | | |
|---------|---|-------|
| (a) | Succession;
Foxgloves change conditions to allow other species to move in;
Growth of shrubs / small trees;
Outcompete/more successful than foxgloves for named resource; | 3 max |
| (b) (i) | Long period for growth/photosynthesis/more leaves/early start in second year;
More food reserves for seed production; | 2 |
| (ii) | Not many will reach suitable conditions/clearings are rare/ better chance of some reaching a clearing;
Small so more easily/more widely/wind dispersed; | 2 |
| (c) | Slows conduction from SAN/ to AVN;
Slows down contraction of ventricles/heartbeat/heart rate/rhythm of heartbeat disrupted;
Less blood/oxygen pumped around the body/to tissues;
Effect on behaviour, e.g. mammals that eat them deterred or become less active;
Selection favours those that do not eat foxgloves; | 3 max |
| | Total | 10 |
-

Question 5

- (a) Broken down;
by bacteria/decomposers/saprophytes; 2
- (b)(i) Birds which eat animals have higher contamination than plant eaters;
Animals higher up the food chain/birds eating fish have highest contamination;
Bioaccumulation of organochlorides; 3
- (ii) Gills have no protective covering/cells are exposed;
Cells have (phospho)lipids in membrane;
Organochlorides can dissolve in *or* diffuse through membranes;
Gills have large surface area exposed to water; 3 max
- (c) Gene produces protein/enzyme;
which inactivates /breaks down/prevents absorption of pesticide; 2
- Total 10
-

Section B**Question 6**

- (a)(i) Range 28–32% ; (answer must relate to the method)
system for counting e.g. seven or eight squares in total; 2
- (ii) Use of grids/coordinates;
Table of random numbers; 2
- (b)(i) Active transport of potassium ions into cells;
Cells have more negative water potential/higher concentration (than neighbours);
Water enters by osmosis/movement to more negative w.p.;
increased pressure/turgidity extends leaflets; 4
- (ii) Humid air trapped/ reduced air flow over surface;
Less transpiration/evaporation/diffusion (from stomata); 2
- Total 10
-

Question 7

- (a) (i) Conversion of nitrates/any nitrogen compound to nitrogen (gas);
by (denitrifying) bacteria; 2
- (ii) Insects contain proteins;
Digested to amino acids;
which can be absorbed/diffuse into leaf; 2 max
- (b) High proportion of carbohydrate/starch in plant tissues;
Cellulose (in cell walls);
More protein in animal cells (such as muscle); 2 max
- (c) Proteins/amino acids broken down;
by saprophytes/decomposers;
deamination/ammonium compounds/ammonia formed;
Ammonia converted to nitrate;
by nitrifying bacteria;
Nitrite as intermediate;
Nitrate can be absorbed by roots; 6 max
- Total 12
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Quality of Written Communication 1