



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2004

GCE

Biology B

Unit BYB7/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) 1.0cm³ of 10⁻² and 9cm³ of sterile water;
(allow appropriate alternative methods) 1
- (b) use of sterile syringes / pipettes;
method to reduce time of exposure to air;
flaming; 2
- (c) dilution plating gives viable count, haemocytometry gives total count;
gives concentration at which bacteria are killed; 2
- Total 5
-

Question 2

- (a) acts on a few types / groups of microorganism; 1
- (b) (i) do not possess a cell wall; 1
- (ii) affects protein synthesis / translation; 1
- (c) has gene for resistance;
codes for enzyme / protein which acts on antibiotic; 2
- Total 5
-

Question 3

- | | | |
|-----|--|-------|
| (a) | mesophile; | 1 |
| (b) | inorganic material / named inorganic source; | 1 |
| (c) | (i) entrapment;
encapsulation;
adsorption;
cross-linking / chemically bonded;
within a partially permeable membrane; | 2 max |
| | (ii) higher optimum temp / faster rate of reaction / more collisions;
more kinetic energy (at higher temp);
enzyme not denatured / tertiary structure not altered;
hydrogen / ionic bonds not broken;
active site not altered so substrate can still bind;
economic benefits qualified; | 3 max |
| | Total | 7 |
-

Question 4

- | | | |
|-----|---|---|
| (a) | diffusion;
antibody and antigen combine; | 2 |
| (b) | has several types of antibodies;
(several precipitation lines represent) different specific reactions; | 2 |
| | Total | 4 |
-

Question 5

- | | | |
|-----|---|---|
| (a) | (i) used in protein synthesis; | 1 |
| | (ii) heat from respiration / metabolism; | 1 |
| (b) | obtaining correct figures from steepest part of graph (60 – 90 hours);
1.2 – 1.4 (<i>correct answer gains two marks</i>); | 2 |
| (b) | penicillin is produced at end of growth / in stationary phase secondary metabolite;
continuous - ‘cells’ are continually dividing / no limiting factors; | 2 |

- (d) (gene) mutation;
linked to enzyme; 2
- Total 8
-

Question 6

- (a) effective water / sewage treatment / prevent water contamination /
improved hygiene / vaccination / quarantining of affected area; (*any two*) 1
- (b) oral rehydration therapy/ORT;
replaces lost water and salts;
OR
drinking large amounts of water;
with salts/minerals; 2
- (c) (i) (protein/poison) excreted / secreted by bacteria; 1
- (ii) receptor / proteins on membrane;
complementary shape of exotoxin; 2
- (d) (i) active transport;
using ATP / carrier proteins; 2
- (ii) higher solute concentration /
water potential lowered in small intestine;
osmotic loss of water; 2
- Total 10
-

Question 7

- (a) blood transfusions / transplants / (contaminated) needles /
across placenta / in mother's milk; (*any two*) 1
- (b) glycoprotein on outer surface;
attach to receptors / proteins (of T cell);
composed of lipid;
fuses with membrane; 2 max
- (c) viruses entered T cells;
viruses destroyed by phagocytosis / antibodies / lymphocytes; 1 max
- (d) decrease in T cells (reduces immune response);
antibody production decreased; 2

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- (e) AZT is used as a nucleotide / competes with thymine;
DNA strand is terminated;
viral RNA not transcribed / reverse transcription /
protein synthesis stopped;
viral replication is prevented; 3 max
- (f) extract mRNA from pancreatic (beta) cells;
supply DNA nucleotides and reverse transcriptase;
produces DNA coding for insulin; 2 max
- Total 11
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