



ASSESSMENT and  
QUALIFICATIONS  
ALLIANCE

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# Mark scheme January 2004

## GCE

### Biology B

### Unit BYB3/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)   | (i)  | arteriole;  | 1     |
|       | (ii) | <i>any two</i><br>oxygen/glucose/amino acids / fatty acids / glycerol / minerals;   | 1     |
| (b)   |      | small diameter/ lumen / small mean cross sectional area /<br>increase in (total) cross sectional area;<br>more surface in contact with blood;<br>greater friction / resistance;<br>(causes) loss of pressure;       | 2 max |
| (c)   | (i)  | artery;   | 1     |
|       | (ii) | stretches/expands to accommodate increase in blood volume /<br>when ventricle contracts/ increase in blood pressure;<br>recoils when blood volume decreases / when ventricle relaxes /<br>blood pressure decreases; | 2     |
| Total |      |   | 7     |
- 

**Question 2**

- |       |  |   |       |
|-------|--|---|-------|
| (a)   |  | increased humidity leads to decreased transpiration;<br>high humidity means more water in the air / increased saturation /<br>increased water potential;<br>reduced diffusion gradient / water potential gradient;<br>slower rate of water loss / less evaporation; | 3 max |
| (b)   |  | thick cuticle;<br>impermeable to water / waterproof;  |       |
|       |  | sunken stomata;<br>reduces water diffusion gradient;  |       |
|       |  | shape of leaf / rounded / small surface area;<br>small surface area : volume ratio;<br>( <i>explanation must be linked to feature</i> )   | 4 max |
| Total |  |   | 7     |
-

**Question 3**

- |       |   |       |
|-------|---|-------|
| (a)   | less muscle / thin(ner) wall in left atrium;  | 1     |
| (b)   | (i) pressure of left ventricle higher than pressure of left atrium;   | 1     |
|       | (ii) closing of the semi-lunar valves/pocket valves;<br>pressure in artery/aorta is higher than ventricle;  | 2     |
| (c)   | (i) (located in) carotid/aortic bodies/medulla;<br>detect high carbon dioxide levels/ H <sup>+</sup> /low pH;<br>due to increased respiration;  |       |
|       | (ii) more impulses;<br>(from medulla) to SAN;<br>via sympathetic nervous system;<br><i>(accept converse reference to parasympathetic)</i><br>(send nervous) <u>impulse</u> to medulla / respiratory centre;<br><i>(3 max for part (ii))</i> | 5 max |
| Total |   | 9     |
- 

**Question 4**

- |       |  |       |
|-------|--|-------|
| (a)   | (i) curve to right of curve for pH 7.4;  | 1     |
|       | (ii) more oxygen unloaded/given up / affinity decreased /<br>reduced saturation;<br>oxyhaemoglobin dissociates at higher oxygen concentration/<br>partial pressure / more oxygen unloaded at the same ppO <sub>2</sub> ; | 2     |
| (b)   | (aerobic) respiration will produce carbon dioxide;<br>carbon dioxide dissolves in blood;<br>forming acid;<br>increases hydrogen ion concentration;<br>anaerobic respiration produces lactate;                            | 3 max |
| Total |  | 6     |
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**Question 5**

- |     |   |   |
|-----|---|---|
| (a) | (i) 29.47(29.5); <i>(2 marks for correct answer)</i><br>40%/0.4 of 2800 / 38; | 2 |
|     | (ii) released as heat;  | 1 |
| (b) | (i) glucose only partly broken down / only broken down to lactate;            | 1 |

- |       |  |       |
|-------|--|-------|
| (ii)  | lactate/lactic acid has built up/been produced;<br>oxygen used to break down lactate;<br>convert it back to pyruvate/glucose/glycogen; | 2 max |
| Total |  | 6     |
- 

**Question 6**

- |       |  |       |
|-------|--|-------|
| (a)   | (i) sucrose;   | 1     |
| (b)   | higher concentration of solute/named solute inside sieve tube/phloem;<br>causing lower water potential;<br>water moves from a high to a low water potential / down a water potential<br>gradient;<br>by osmosis/diffusion; | 3 max |
| (c)   | (i) (yes) (radioactivity) found in young fruit / tips of roots;  | 1     |
|       | (ii) (yes) (radioactivity) present above and below leaf supplied;  | 1     |
|       | (iii) (no) no evidence as to which tissue was used;  | 1     |
|       | (iii) (no) leaf could have used (radioactive) carbon to make any<br>organic molecule/substance/other tracers needed to show<br>transport of other substances;  | 1     |
| Total |  | 8     |
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**Question 7**

- |     |   |       |
|-----|---|-------|
| (a) | 1. permeable capillary wall/membrane;<br>2. single cell thick/thin walls, reduces diffusion distance;<br>3. flattened (endothelial) cells, reduces diffusion distance;<br>4. fenestrations, allows large molecules through;<br>5. small diameter/ narrow, gives a large surface area to volume/<br>short diffusion distance;<br>6. narrow lumen, reduces flow rate giving more time for diffusion;<br>7. red blood cells in contact with wall/ pass singly, gives short diffusion<br>distance / more time for diffusion;<br>(allow 1 mark for 2 features with no explanation) | 4 max |
|-----|---|-------|

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(b)	1. (hydrostatic) pressure of blood high at arterial end;	
	2. fluid/water/soluble molecules pass out ( <i>reject plasma</i> );	
	3. proteins/large molecules remain;	
	4. this lowers the water potential / water potential becomes more negative;	
	5. water moves back into venous end of capillary ( <i>reject tissue fluid</i> );	
	6. by osmosis / diffusion;	
	7. lymph system collects any excess tissue fluid;	
	8. (lymph) returns to blood / circulatory system / link with vena cava/ returns tissue fluid to vein;	6 max
		Total 10

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QWC (See guidance)	1
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