



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2004

GCE

Biology A/ Human Biology

Unit BYA8/W

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Question 1

- (a) Tapes / string / axes laid out at right angles / grid area;
Method of obtaining random co-ordinates;
 Do not allow “Use random number generator” 2
- (b) (i) Decrease then remain constant;
 From 200 cm / over 150 cm; 2
- (ii) Oxygen decreasing because soil becomes more compacted/ not replaced;
 Decrease in oxygen leads to fewer aerobes surviving;
 Respiration; max 2
- (c) Anaerobic bacteria replace aerobic;
 As oxygen decreased by aerobic bacteria;
 Remove competition;
 Aerobic bacteria no longer able to survive in these conditions; max 3
- (d) (i) Near the surface / in top 50 cm;
 Table shows decrease with time at greater depths; 2
- (ii) Decrease;
 Fewer aerobic bacteria with depth;
 Oxygen concentration decreases / less oxygen at depth; 3
- (d) Probability greater than 95% / 0.95;
 Results are not due to chance / results are significant;
 Because bars do not overlap; 3
- (e) Plot as graph;
 Draw line of best fit;
 Read off appropriate value; 3

Total 20 marks

Question 2

- (a) Presence of resistant and non-resistant varieties / mutation produces resistant variety;
Resistant ones survive / non-resistant ones killed by treatment;
These will reproduce and produce more resistant parasites/pass on resistance allele;
Greater probability of another person being infected by resistant parasites;
max 3
- (b) Likelihood of being infected (by strain resistant to both drugs) is less;
 $1/500 \times 1/500 / 1/250\ 000$;
Drug has longer effective life;
max 2
- (c) (i) As comparison / to show that nothing else in the treatment was responsible; 1
(ii) Given injections of saline / injection without SPf66;
(otherwise) treated the same as experimental group; 2
- (d) (i) 100%; 1
(ii) 10%; 1
- (e) (i) Different lengths of DNA have different base sequences / cut at specific sequence;
Results in different shape / different shape of active site;
Therefore (specific sequence) will only fit active site of enzyme; 3
(ii) Recognition sites contain only AT pairs;
Which would occur very frequently; 2

Total 15 marks

General Principles for marking the Essay:

Four skill areas will be marked: scientific content, breadth of knowledge, relevance and quality of language. The following descriptors will form a basis for marking.

Scientific Content (maximum 16 marks)

Category	Mark	Descriptor
Good	16	Most of the material reflects a comprehensive understanding of the principles involved and a knowledge of factual detail fully in keeping with a programme of A-level study. Some material, however, may be a little superficial. Material is accurate and free from fundamental errors but there may be minor errors which detract from the overall accuracy.
	14	
	12	
Average	10	Some of the content is of an appropriate depth, reflecting the depth of treatment expected from a programme of A-level study. Generally accurate with few, if any, fundamental errors. Shows a sound understanding of the key principles involved.
	8	
	6	
Poor	4	Material presented is largely superficial and fails to reflect the depth of treatment expected from a programme of A-level study. If greater depth of knowledge is demonstrated, then there are many fundamental errors.
	2	
	0	

Breadth of Knowledge (maximum 3 marks)

Mark	Descriptor
3	A balanced account making reference to most areas that might realistically be covered on an A-level course of study.
2	A number of aspects covered but a lack of balance. Some topics essential to an understanding at this level not covered.
1	Unbalanced account with all or almost all material based on a single aspect.
0	Material entirely irrelevant or too limited in quantity to judge.

Relevance (maximum 3 marks)

Mark	Descriptor
3	All material presented is clearly relevant to the title. Allowance should be made for judicious use of introductory material.
2	Material generally selected in support of title but some of the main content of the essay is of only marginal relevance.
1	Some attempt made to relate material to the title but considerable amounts largely irrelevant.
0	Material entirely irrelevant or too limited in quantity to judge.

Quality of language (maximum 3 marks)

Mark	Descriptor
3	Material is logically presented in clear, scientific English. Technical terminology has been used effectively and accurately throughout.
2	Account is logical and generally presented in clear, scientific English. Technical terminology has been used effectively and is usually accurate.
1	The essay is generally poorly constructed and often fails to use an appropriate scientific style and terminology to express ideas.
0	Material entirely irrelevant or too limited in quantity to judge.

Total 25 marks