AQA

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark scheme January 2003

GCE

Biology/ Human Biology A

Unit BYA8/W

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Unit 8: Written synoptic (Biology A)

Question 1

(a)		Decreases; = 1 mark Decreases with reference made to more rapid at first/ slower rate of decrease as fish gets longer/ proportionately, the decrease remains the same;; = 2 marks	2
(b)		Volume may not be directly proportional to mass over entire range/ relative amounts of various tissues may change;	1
(c)	(i)	More tissue/ cells/ required for specific purpose in adult; More (oxygen for) respiration;	2
	(ii)	More via gills/ less via body surface;	1
(d)	(i)	Blood with high oxygen content; Will meet water with higher oxygen content; [*Accept: Blood always meets water with higher oxygen content for both points*] Maintains concentration gradient/ does not reach equilibrium; Allows more oxygen to diffuse into the blood/ more efficient diffusion;	max 3
	(ii)	Increases chance of coming into contact with oxygenated water/ greater flow of oxygen/ water over body/ gills; In still water much oxygen will have diffused into fish/ increases concentration gradient/ concentration difference over exchange surface/ skin;	2
(e)	(i)	The valves will only allow blood in this direction/ prevent backflow;	1
	(ii)	Pressure increases in sinus venosus/ higher than in veins; No valves to prevent backflow;	2
	(iii)	Gills;	1
(a)		0.2 seconds; Pressure in ventricle higher than in artery **A**;	2
(b)		Stroke volume more important in fish/ heart rate more important in mammals; Calculation clearly compares change in heart rate and stroke volume in each animal; Calculation based on factor/ percentage increase;	3

Total 20 marks

Question 2

(a)	(i)	Same general structure as all amino acids; = 1 mark Same general structure as all amino acids and answer making specific reference to amino/ NH_2 group and carboxyl/ COOH group;	2
	(ii)	Not <u>normally</u> found in proteins/ polypeptides; [*Note: Alternative answers must fit with information provided in passage*]	1
(b)	(i)	Protein will have different tertiary structure; Affecting shape of active site; Therefore unable to bind to substrate/substrate not able to fit/cannot form enzyme-substrate complex;	3
	(ii)	tRNA does not bind with non protein amino acids/ACA; tRNA will only bring proline/will not bring ACA to ribosome/mRNA; Enzyme molecules will only contain proline/will not contain ACA; max	2
(c)		Competitive because toxin/swainsonine has sugar-shaped molecules; Which will fit into active site of enzyme/mannosidase;	2
(d)	(i)	Contains waste produced in the body/ as a result of metabolism;	1
	(ii)	In renal/Bowman's capsule/glomerulus; Small molecules filtered from blood/into filtrate;	2
(e)		Some species can make particular toxins harmless; Therefore can feed on particular plants; OR Toxins distributed in different quantities in different parts of plants; Therefore different species can feed on different parts of plant/ can eat different part of plant at different time; max	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 14 12	Most of the material of a high standard reflecting 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.
Average	10 8 6	A significant amount 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 most of the principles involved.
Poor	4 2 0	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.

Breadth of knowledge (maximum 3 marks)

Mark	Descriptor
3	A balanced account making reference to most if not all 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.

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