



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Biology 5416/6416 *Specification B*

Behaviour and Population BYB8/A

Mark Scheme

2005 examination – June series

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Dr Michael Cresswell Director General

General Guidance for the Mark Scheme

The following conventions are used in the mark scheme:

- A semicolon (;) separates each mark point
- An oblique stroke (/) separates alternatives within a mark point
- Underlining of a word or phrase means that the term must be used by candidates
- Brackets are used to indicate contexts for which a mark point is valid, but which may just be implied by a candidate's answer
- '*Accept*' and '*reject*' show answers which should be allowed or not allowed.
- Additional instructions may be shown in *italics*

The scheme shows the minimum acceptable answer(s) for each mark point - better, more detailed, or more advanced answers are always accepted, provided that they cover the same key ideas. Occasionally, a candidate will give a biologically correct answer that has not come up at standardising. If it is equivalent in standard to the mark scheme answers, it may be credited.

In some cases a mark may be awarded for understanding of a general principle, even though the detailed mark points on the scheme have not been made. This will be indicated on the mark scheme.

All mark points are awarded independently, unless a link between points is specified in the scheme.

Converse answers are normally acceptable, unless the wording of the question rules this out.

Disqualifiers

A correct point is disqualified when the candidate contradicts it in the same answer.

The list rule

When a question asks for a specific number of points, and the candidate gives more, any wrong answer cancels a correct answer. For example, if a question asks for two points and three answers are given, two correct and one clearly wrong, the mark awarded is one, whatever the order of the answers.

Valid points from **diagrams** are credited, if they are not duplicated in the text.

Where a question asks for **differences** between X and Y, the mark may be awarded for a feature of X without the converse for Y, if it is absolutely clear which is being referred to.

BYB8/A**Question 1**

- | | | | |
|-----|------|--|-------|
| (a) | (i) | stimulates/increases; | 1 |
| | (ii) | (increased) respiration/energy release;
for named relevant process, e.g. cell division/protein synthesis,
calcium metabolism; | 2 |
| (b) | (i) | respiratory/fat/glycogen reserves used up; | 1 |
| | (ii) | lowered rate of glucose metabolism/intake balances use;
high levels of thyroxine <u>in the blood</u> ;
inhibits pituitary/hypothalamus/ inhibits its own release;
thyroxine production reduced; | 2 max |

Total 6**Question 2**

- | | | | |
|-----|-------|--|-------|
| (a) | (i) | learning from parents;
reduces chance of overcooling/predation; | 1 max |
| | (ii) | (selection of mate of) own species; | 1 |
| (b) | | naïve / no visual stimulus / no model duck / no object;
therefore no imprinting occurs; | 2 |
| (c) | (i) | 15 hours after hatching/old; | 1 |
| | (ii) | most sensitive to imprinting; | 1 |
| | (iii) | less exposed to predators than in the nest;
able to follow parents to food/find own food; | 2 |

Total 8

Question 3

- (a) (i) build up of fatty deposits/atheroma/arteriosclerosis/ plaque deposits/
blood clots;
in walls of arteries; 2
- (ii) narrowing/blockage (of coronary arteries);
restricts/reduces blood flow to the heart;
heart reduced supply/starved of oxygen;
muscle dies;
(allow points included in answer to part (i))
(cardiac muscle) does not contract; 3 max
- (b) fewer people with very high cholesterol levels;
therefore contribution to total/ relative number of deaths lower; 2
- Total 7**

Question 4

- (a) (i) reduced risk of predation; 1
- (ii) a chemical (released by one organism);
that affects the behaviour of another specific example of behaviour; 2
- (b) principle of sequential multiplication ($0.9 \times 0.6 \times 0.75 \times 0.67$);
0.27;
(correct answer 2 marks) 2
- (c) (i) similar sequence/actions/ sign stimuli; 1
- (ii) additional action in sequence(species A)/scissor wings blocks
sequence in B; 1
- (d) (acts as) sign stimulus;
responds only to species-specific sound; 2
- Total 9**

Question 5

- (a) (i) one ovum only, ripening;
FSH (normal cycle); 1 max
- (ii) FSH produced/released;
from pituitary;
no inhibition; 2

- (b) (i) female XX, male XY;
Y shorter/smaller than X; 2
- (ii) haemophilia is a recessive allele;
defective allele (gene) present on X, missing from Y;
male 0.5(50%/1/2) probability of haemophilia;
female 0/no chance;
(0.25(25%/1/4) first baby having haemophilia);
- or*
- $X^H X^h$ $X^H Y$;
 $X^H X^H$ + $X^H X^h$ + $X^H Y$ + $X^h Y$;
 $X^h Y$ is a sufferer 3 max
- Total 8**

Question 6

- (a) (i) (measure of the) spread/variation about the mean; 1
- (b) (i) high birth mass high zinc/low birth mass low zinc/ mass 3.00 –
3.49 highest zinc concentration;
higher birth masses zinc concentration remains constant
(S.D. overlap); 2
- (ii) increase in rate of enzyme controlled reactions /metabolism;
protein synthesis/respiration/DNA replication/mitosis;
- or*
- increase in placental transfer;
amino acids/respiratory substrate; 2
- (iii) carrier/specific proteins;
active transport/facilitated diffusion; 2
- (c) binds to enzymes(involved in growth);
allosteric site/site other than active site;
distorts shape of enzyme/active site;
substrate no longer complementary;
substrate no longer binds/product not released;
reduces enzyme activity /rate of production of product; 5 max

Total 12