



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2003

GCE

Biology/ Human Biology A

Unit BYA9/W

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Unit 9: Written synoptic (Human Biology)**Question 1**

- (a) (i) Exactly the same way as the experimental group;
But fed on a complete diet/all amino acids present; 2
- (ii) Similar number of caterpillars survive as in control/most/high percentage
of caterpillars survive when no glutamate in diet;
Therefore must be synthesised/made from something else; 2
- (b) (i) Increases; = 1 mark
Increases with reference made to more rapid at first/ slower rate of increase
with increase in concentration;; = 2 marks 2
- (ii) Curve levels out/rate decreases;
As all carrier proteins are in use/working at maximum rate; 2
- (c) (i) Maintains a high concentration of amino acids/constant supply;
Near the epithelial cells/carrier molecules/wall of intestine; 2
- (ii) Muscle; 1
- (d) Add hydroxyl/OH group (to phenylalanine); 1
[Ignore: references to hydrolysis]
- (e) Fair skin/hair/eyes blue/not brown;
Will not produce tyrosine;
No melanin/skin pigment;
OR Small size/lower rate of metabolism;
No/less thyroxine/thyroid hormone produced;
Controls metabolic rate/important in growth of young children;
OR Less adrenaline/nor adrenaline;
Affects synapses;
Additional detail as to how; 3
- (f) (i) Tyrosine not produced;
Tyrosine essential as converted to other substances/specified substance; 2
- (ii) Brain more or less fully formed by six years old; 1
- (g) Conversion to phenylpyruvic acid;
Substances cross placenta (into fetal blood); 2

Total 20 marks

Question 2

- (a) Lower temperature in toes/extremities;
Urate less soluble at low temperatures; 2
- (b) Competitive because allopurinol likely to have same shape as/chemically similar to substrate;
Which will fit into active site of/will form ES complex with enzyme/
xanthine oxidase; 2
- (c) A protein;
Would be digested/broken down by enzymes/specified enzyme; 2
- (d) (i) Substance which triggers an immune response/antibody reaction; 1
- (ii) Genetic engineering produces human insulin/insulin very similar to human insulin;
Difference in amino acids which make up cattle insulin;
Therefore will not be accepted as self/doesn't treat it as foreign; max 2
- (e) Water potential in bacterial cells lower/more negative than outside;
Water moves in by osmosis/diffusion;
No wall/weak wall cannot withstand increased pressure; 3
- (f) (i) DNA in gene cut into lengths;
So cannot be transcribed/mRNA cannot be made;
Will not produce the complete mRNA molecules coding for protein; max 2
- (ii) DNA is also present in cancer cells/
cancer cell does not have peptidoglycan/cell wall; 1

Total 15 marks