



ASSESSMENT and  
QUALIFICATIONS  
ALLIANCE

# Mark scheme

# June 2002

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## GCE

## Biology A / Human Biology

## Unit BYA9

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**Question 1**

- (a) (i) Biuret / correct ingredients;  
Purple / mauve / lilac / violet / pink colour; **2**  
*Do not award credit for 'blue'.*
- (ii) Run lysine separately;  
Identical position on same chromatogram / under same conditions;  
*OR*  
Calculate Rf value;  
By dividing distance moved by (solute) spot by distance moved  
by solvent;  
Compare with known value (for lysine) / table / grid; **2 max**
- (b) (i) Breaks down / digests lipid / triglycerides / fat (found in milk);  
When milk reaches small intestine / not digesting lipid in mammary  
glands / idea of delay;  
Unable to digest (fully) on its own; **2 max**
- (ii) Infant only has limited ability to digest proteins;  
Can only obtain essential amino acids from diet / cannot synthesise  
essential amino acids;  
Needed for rapid growth; **2 max**
- (c) (i) Immediate values cannot be predicted (reliably);  
Line of best fit can't be drawn / not justified by data; **1 max**
- (ii) Assesses probability;  
Of results being due to chance; *allow reverse e.g. references to  
causative factor*  
Difference significant;  
Ref. to accuracy of means / shows correlation; **2 max**
- (d) (i) General description incorporating three phases shown on graph;  
Less variation early in the morning / 7 a.m.; **2**
- (ii) Food availability;  
Is likely to be seasonal / determined by temperature / rainfall / climate;  
Leads to variation in fat stores / subcutaneous fat in mother;  
Which is mobilised to produce milk during lactation; **3**
- (a) Terminal OH;  
Hydrogens on hydrocarbon chain with no double bonds; **2**  
*Do not penalise references to C-O bond – ignore.*
- (b) Decrease in (percentage of) saturated fats / increase in unsaturated fats;  
Move towards healthy eating / less saturated fat / more unsaturated fat; **2**

**Total 20 marks**

**Question 2**

- (a) Insulates nerve fibre / axon / does not allow passage of ions / charge;  
Ions only pass at non-myelinated points / nodes / action potential only occurs at node;  
Saltatory conduction (is faster) / description of ‘jumping’; **2 max**
- (b) Rise / fall in cholesterol concentration in cytoplasm / cell;  
*Reject references only to plasma concentrations;*  
Fall / rise in cholesterol receptors (in plasma membrane);  
Leads to fall / rise in cholesterol / cholesterol returns to norm; **3**
- (c) (i) Mutation produces receptor with different shape / tertiary structure / not specific to LDL;  
So LDL will not bind to it and be absorbed / removed from the blood;  
*Do not penalise ‘active site’.* **2**
- (ii) Endothelium / lining of artery torn / damaged;  
Atheroma / plaque / underlying cells come into contact with blood;  
Triggers blood clotting mechanism;  
OR  
Artery narrowed by plaque / atheroma;  
May be blocked by clot from elsewhere; **2 max**
- (d) 2517; **1**  
*Accept 2514 or 2511 if explanation refers to start / and stop codons.*
- (b) If recessive would inherit one allele from each parent; *reject ‘gene’*  
Parents could be heterozygotes / carriers;  
Parents / heterozygotes / carriers would not show the condition;  
*NB points 2 and 3 may appear in one linked sentence.*
- (c) 1003.3 / 1003;  
*Two marks for reason from below:*  
(As dominant,) both heterozygote and homozygote at risk;  
(Heterozygotes 1 in 100 so) 1000 are heterozygous;  
(Homozygotes 1 in 30000 so) 3 / 3.3 homozygous; **3 max**

**Total 15 marks**