

Examiners' Report June 2009

GCE

GCE08 Biology (8BI07) International Supplement

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Maximum mark 40

Mean mark..... 23.2

Standard deviation..... 5.5

Question 1

Most candidates were able to come up with a suggestion related to quantity of pigment being comparable in (a)(i), but if it was just stated that they should have the same number of cells, this was not enough with relating it to pigment quantity. Most candidates scored the mark in (a)(ii). Again, most candidates got the colorimeter mark in (a)(iii) with some confusion over calorimeter. It should be appreciated that spelling will be penalised where the word written could be confused with another biological entity. The full three marks were rarely achieved by those who used a method for assessment of intensity of colour that did not involve a colorimeter. A worryingly large number of candidates lost all the marks on (a)(iv) because they failed to take note of the instruction to name 'other' processes and so talked about beetroot piece size and time in the water. This would be an excellent example to use to demonstrate the dire consequences of not taking note of every word in a question. The misuse of the word 'amount' was common in this question: candidates should be strongly urged to talk about volume, mass or whatever physical quantity is relevant.

The vast majority of candidates got the mark on (b)(i). A very few identified the student 2, 0.50 figure as an anomaly. The graphs in (b)(ii) were remarkably well drawn with very few axes the wrong way round. The biggest loss of marks was through incorrect axis labels, followed by scales with breaks half way along the y axis. The accuracy of plotting was very good. There were a few bar charts. Some candidates took up a lot of time drawing error bars, despite the fact that the question asked for the mean. The best advice when plotting graphs is to join the points with a straight ruled line. However, it is clear that when candidates do this there is a tendency to then describe every little fluctuation in this line, rather than to look for overall trends and then comment on significant changes to this trend. A description that describes the changes between each of the points is a reiteration of the data and is unlikely to gain marks. If a line of best fit is required in future, that should be clearly requested in the question.

Descriptions of the graph in (b)(iii) were, as indicated above, rather tedious accounts of every change that took place; and there was a tendency to describe the graph as if the x axis were time. Phraseology of the explanations was generally poor with very little use of the word 'permeable'. There was considerable confusion about enzymes and rates of reaction among some of the lower scoring candidates. Some candidates identified points as anomalous. Some of these arguments had some merit, especially when reference was made to raw data. This question often scored only the three marks for the description with none for an explanation at all.

Question 2

Answers to (a)(i) were very variable. Candidates seemed aware of the different possibilities without being able to link the technique to how it would be involved in bringing down the incidence of TSD. There were a very few answers which scored two marks for (a)(ii), but most answers were based on 'right to life' arguments. There was very little positive ethics in the answers.

Part (b)(i) discriminated well. In the first part, the main loss of marks came from the failure to identify gametes. In students that used a Punnett square, the failure to identify parents was a problem. There were remarkably few problems with thinking that AA was the genotype for Tay-Sachs.

Part (b)(ii) started to discriminate between two marks and three. Again, the biggest problems were y axes with breaks in the scale. Probably the most challenging question on the paper was (b)(iii), with many candidates simply misunderstanding what the information was showing. Again, as in the graph interpretation question, Q1(b)(iii), a regurgitation of the figures will not gain marks. So, not '57% deserve to know' but an interpretation such as 'the majority deserve to know'.

Candidates found (b)(iv) relatively easy and there were some very good responses. Some interpreted the question in terms of 'which other questions would you put into the questionnaire', but even that did not prevent some of them picking up marks. Slightly more specific suggestions as to where to look were needed in some cases, such as 'on the web through a search engine like Google' rather than just 'on the internet'.

APPENDIX A
Unit Grade Boundaries And Uniform Marks

The raw mark obtained in each module is converted into a standardised mark on a uniform mark scale, and the uniform marks are then aggregated into a total for the subject. Details of the method of aggregation are given in Appendix B.

For AS examinations, the two examined unit tests (6BI01 & 6BI02) each have a weighting of 40% with a maximum of 120 uniform marks; and the coursework unit* (Unit 6BI03) has a weighting of 20% with a maximum of 60 uniform marks.

For the A2 units, the two examined unit tests (6BI04 & 6BI05) also each have a weighting of 40% with a maximum of 120 uniform marks; and the coursework unit* (Unit 6BI06) has a weighting of 20% with a maximum of 60 uniform marks.

Therefore, for candidates taking the full A level, the four examined unit tests (6BI01, 6BI02, 6BI04, 6BI05) each have a weighting of 20% with a maximum of 120 uniform marks; and the two coursework units* (Unit 6BI03 & 6BI06) have a weighting of 10% with a maximum of 60 uniform marks.

The table below shows the boundaries at which raw marks were converted into uniform marks in this examination. The A and E grade boundaries are determined by inspection of the quality of the candidates' work. The other grade boundaries are determined by dividing the range of marks between A and E. Marks within each grade are scaled appropriately within the equivalent range of uniform marks.

Unit grade boundaries

Unit	Maximum mark	Grade				
		A	B	C	D	E
	<i>Uniform marks</i>					
	60	48	42	36	30	24
	<i>Raw marks</i>					
6BI07 (International)	40	29	25	22	19	16

*or written alternative for International centres

APPENDIX B

The Uniform Mark System for AS and A level Unit Schemes

The result for each unit will be issued as a standardised mark on a uniform mark scale. AS Biology has a total of 300 uniform marks and A level Biology has a total of 600 uniform marks.

Tables 1 and 2 show the numbers of uniform marks required to gain each subject grade in AS and A level Biology. They also indicate the number of uniform marks in units with various weightings that will aggregate into the appropriate subject grade. These provide a guide to the level of performance in each unit.

The uniform marks shown for each unit do not necessarily represent the actual mark range used for marking. Grade boundaries for A and E are set at Awarding meetings on the basis of candidate performance on the actual mark range used. These boundaries are then converted to the uniform marks shown in the tables, with intermediate values calculated accordingly.

Table 1 - Advanced Subsidiary Subjects

Subject		Unit Weighting					
Grade	UMS	20%	30%	33 $\frac{1}{3}$ %	40%	50%	60%
Max mark	300	60	90	100	120	150	180
A	240	48	72	80	96	120	144
B	210	42	63	70	84	105	126
C	180	36	54	60	72	90	108
D	150	30	45	50	60	75	90
E	120	24	36	40	48	60	72

A candidate for AS Biology or must take three modules, weighted at 40% for the two written units (6BI01 & 6BI02), and at 20% for the coursework unit (6BI03).

	Uniform mark obtained	Approximate level of performance
Unit 1	78	C
Unit 2	88	B
Unit 3	50	A
Subject Total	216	Subject Grade = B

Table 2 - Advanced Level Subjects

Subject		Unit Weighting				
Grade	UMS	10%	15%	16 ² ₃ %	20%	25%
Max mark	600	60	90	100	120	150
A	480	48	72	80	96	120
B	420	42	63	70	84	105
C	360	36	54	60	72	90
D	300	30	45	50	60	75
E	240	24	36	40	48	60

A candidate for A level Biology must take six units, weighted at 20% for the two written units (6BI01, 6BI02, 6BI04 & 6BI05), and at 10% for the coursework units (6BI03 & 6BI06). The candidate in this example has five units in the bank.

	Uniform Mark Obtained	Approximate performance level of
Unit 6BI01	86	B
Unit 6BI02	76	C
Unit 6BI03	44	B
Unit 6BI04	98	A
Unit 6BI05	*	
Unit 6BI06	36	C
Partial Total in Bank = 340		

The candidate already has 340 uniform marks in the bank. If a Grade C is required in the subject, the candidate must obtain at least 20 UMS marks from Unit 5 or if a Grade B is required the candidate must obtain 80 UMS marks or more from Unit 5.

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