GCE BIOLOGY
BIO3X – Externally Marked Practical Assignment
Report on the Examination

2410
June 2013

Version: 1.0
General Comments

Students found little difficulty in carrying out the instructions to the practical activity and the processed data generated consistent patterns of results. On each aspect of the paper, there was a good range of marks. Although Task 2 was straightforward, many students still made errors on graphs and tables.

Task 1

The questions on this paper proved very challenging for some students and there was more differentiation in the range of marks this year.

Question 1

Many students could give a correct feature of the agar or dye being the same; the most common features given were concentration or pH. Most errors were due to vague answers referring to making sure results were reliable or cubes were identical.

Question 2

Many students failed to gain this mark. Many stated that that it was only the concentration that was important, or simply that the acid was in excess.

Question 3

(a) Most students appeared to have the correct idea here but poor expression often let them down. There were vague references to ‘affecting’ or ‘changing’ the surface area of the blocks, without stating if this meant an increase or a decrease.

(b) Many students incorrectly referred to using a larger beaker. Correct answers tended to go for suspending the blocks in some way, rather than swirling the contents.

Question 4

Most students gained the mark by referring to diffusion. Errors involved simply quoting the colour change, or referring to the dye diffusing out of the blocks.

Question 5

Most students only gained one mark here. This was because they failed to include an explanation relating to the shorter diffusion pathway. A few students incorrectly related size and surface area.

Task 2

Question 6

Tables were generally clearly and well presented. Some errors were due to referring to ‘size’ or ‘time’ without qualification in the headings. A few students still added units in the body of the table, as well as in the heading and a small number of students used mixed units of minutes and seconds.
Question 7

Nearly all students gained the marks here for a consistent pattern of results.

Question 8

(a) Most students provided correct explanations; though a few of these were rather convoluted and difficult to follow. A minority divided volume by surface area.

(b) Plotting errors were common, especially when plotting 0.46 and 0.86 using a difficult scale on the x axis. There were some cases of non-linear scales on the x axis. Some students failed to obtain certain marks because they plotted surface area to volume ratio against side length and others inappropriately extrapolated their graph line.

Written Test: Section A

Question 9

Most students gave correct responses related to acid concentration or temperature and many provided correct explanations. Very few referred to features of the agar.

Question 10

Many students scored well on this question by correctly referring to blocks touching each other, or the end point being subjective. Rather than limitations of the method, some students made inappropriate references to human errors relating to cutting of the blocks, or not putting them in the acid at the same time.

Question 11

Students who understood the question came up with good ideas, referring to differences in shape or size, or lack of cell membrane or organelles. Incorrect responses referred to the agar block as being partially permeable, or simply that it was a good experiment as the results were easy to see. Very few students put forward the idea that agar was suitable because diffusion is passive.

Question 12

(a) There were some good responses gaining 2 marks but many students failed to describe the trend in sufficient detail to score a mark and/or missed the change in gradient.

(b) Students scored well on this question. Some students failed to relate this to organisms and missed the first marking point. Others simply repeated the stem of the question, rather than adding a relationship to diffusion or absorption of oxygen. A few students referred to insects as their example of small organisms.

Question 13

There were some good answers but many students referred to factors which bore no relationship to surface area, simply quoting an adaptation they had learned. There were also inappropriate references to water potentials or concentration gradients.
Question 14

Students who understood the question performed well here. Some failed to score due to vague references to 'changes' or 'differences' in concentration of acid or concentration gradient, or failed to relate differences to diffusion.

Written Test: Section B

Question 15

Most students interpreted the data correctly and scored well on this question.

Question 16

Many students gained full marks here. A common error related to references to energy being produced rather than released. Some students provided details of emphysema, which were needed for subsequent answers. Very few students used the term 'ventilation'.

Question 17

Only a small number of students gained full marks here. There were very few references to reduced tidal volume or to less oxygen entering the alveoli. Again, some used vague references to simply 'affecting' concentration gradients. Many students failed to understand the stem of the question and repeated answers given in questions 16 or 18.

Question 18

(a) Performance on this question was much better. Some students, however, failed to refer to alveoli being damaged here, having mentioned it in other answers.

(b) Many students gained one mark for referring to reduced surface area, but failed to provide a further explanation. There was widespread use of general terms such as 'efficient' gas exchange.

Question 19

Students did not score highly on this question. They often failed to interpret the question and use the data appropriately. Few students quoted correct figures and many failed to realise that the figures for stomach cancer and heart disease showed little difference. Many wrote in terms of contracting the disease rather than dying from it, as referred to in the resource. Others vaguely referred to 'certain diseases' and therefore failed to gain credit. In many cases, students simply repeated answers they had learned from past papers. These answers often gained one mark for referring to the idea that other factors are involved.

Question 20

Some students knew this topic well and gained full marks with accurate recall. Some failed to score because of vague references to high blood pressure putting strain on the heart, rather than linking it to damage to blood vessels. Some students simply provided descriptions of heart disease and atheroma, which did not score marks as they failed to link them to smoking. Others inappropriately
linked carbon monoxide to heart rate, blood pressure or atheroma. A few students thought that tar blocked arteries.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMSconversioncalculator