General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H   Unit Biology 1

Report on the Examination

2011 examination – June series

Science B / Biology
Higher Tier BLY1H

General

There were eight questions on the paper. Questions 2 and 3 (termed Standard Demand) were common to Foundation and Higher Tiers. These were targeted at grades C and D. Questions 1 and 4 were also Standard Demand. The remaining questions were High Demand, targeted at grades B, A and A*.

Candidates should be advised to write in black ink or black ball point pen only as the scanning process involved in on-line marking does not pick up pale colours well. Furthermore, candidates should be advised to ensure that if their answers extend beyond the printed lines or space then they should keep these extensions away from the edges of the page as they may be removed during scanning. Candidates who wrote far too much irrelevant material in the earlier questions often left insufficient time to complete the last question.

Some examiners expressed concern about illegible handwriting. Although it is a very small percentage, candidates should be aware that if the examiner cannot read the script they will not be awarded any marks for that part.

Fundamental knowledge and understanding of How Science Works in the world at large, as well as in the laboratory, were tested throughout this paper. This means that candidates should be reminded that it is essential to read all of the question carefully, analyse the information provided and think about their response before writing their answer.

Question 1 *(Standard Demand)*

(a)   The vast majority of candidates answered correctly in terms of 'food', 'mates' and 'territory'. Some candidates were too vague with their responses giving 'habitat' and 'place to live'. One common misconception was 'water', which has relevance only to plants.

(b)   (i)   Although almost all candidates obtained at least one mark, only half of them gained the second mark. Often candidates described the whole of the graph or described the rise and fall of mule deer. Candidates should be reminded to limit their descriptions to the range required.

(b)   (ii)   Whilst a majority of candidates gained one mark, only a minority gained the second mark. Many candidates stated that it was the white deer numbers that caused the mule deer numbers to change. Since candidates were asked to use information from the graph, suggestions of new predators and new diseases did not gain credit. A common reason for gaining only one mark was to ignore the increase in white-tailed deer numbers. A minority of candidates did not realise that deer are herbivores and wrote about numbers of prey.

Question 2 *(Standard Demand)*

(a)   The majority of candidates were able to identify at least one factor, usually 'age of the participants'. There were however, many incorrect answers based on numbers of participants – either the number in each group or, the total number involved in the investigation. The length of time over which the trial was conducted was also frequently suggested as a control variable.

(b)   A majority of candidates gave a reasonable suggestion for the placebo. Although many candidates realised that the placebo group was designed to be a control for the trial it was often stated that the placebo itself was the 'original statin' or 'a different statin'. Some even imagined it to be 'something which increases the chance of a heart attack'. Considerable numbers of candidates made no distinction between the word 'drug' and the word 'tablet', taking them both to have the same meaning, thus phrases such as 'a drug that contained no drug' were often seen. Others were only able to state that it should look just like the rosuvastatin but failed to suggest what might be in it (or what would not be in it).

(c)   Most candidates appreciated that the reliability of the results depended on the large number of people taking part. However, other suggestions included 'accurate measuring', 'it was properly controlled' and 'it was independently carried out'. A number of answers were couched in terms of the reliability (or effectiveness) of the drug rather than reliability of the results, for example 'because the rosuvastatin was so successful' or 'it worked for so many of the trialists'.

(d)   A majority of the candidates gave reasonable responses. Many of these responses mentioned the risk of heart attack in the placebo group. However, a considerable number of candidates thought that this was as a result of taking the placebo, for example 'because the placebo was giving people heart attacks'. Others thought that the rosuvastatin was simply the lesser of two evils giving answers such as 'the placebo was more likely to cause a heart attack than the rosuvastatin'. Other candidates understood that a substantial amount of evidence must have been accumulated but it was frequently implied that the result had been anticipated and the trial was stopped when the 'testers were proved right' or 'had the results they wanted'.

(e)   The majority of answers were based on fairness in the sense that the manufacturers may be biased or might even 'cheat' in some way. Some candidates actually appreciated that it was important not only that the trial be conducted independently but should also be seen to be conducted independently. Many other responses suggested that the manufacturers simply didn't meet the criteria required to take part because 'they would be too young' or 'too healthy' for example. There were rather a lot of cynical ideas about manufacturers 'not wanting to suffer any possible side effects' and even 'if the drug causes problems they would rather volunteers used it'.

(f)   The vast majority of candidates managed to gain at least one of the two marks available here and many answers included accurate explanations of the way in which reduced concentrations of LDL or saturated fats improved heart health. Nevertheless a significant number were not able to interpret the information in the table correctly. Some imagined that the rosuvastatin column showed the original concentrations and that the placebo raised LDL or saturated fat levels rather than the drug lowering them. Thus statements such as 'LDL level in people given the placebo has doubled in the last 3 years' were seen. Other candidates thought that the figures in the table referred to numbers of people rather than concentrations, for example 'only 53 people had LDL when given rosuvastatin' and 'it reduced the amount of people with saturated fats'.

Question 3 *(Standard Demand)*

It was disappointing that less than one third of the candidates gained full marks on this, a straightforward recall question. To gain full marks candidates had to refer to the engulfing of pathogens, the production of antibodies, the production of antitoxins and one further amplification point.

Many candidates failed to gain the engulfing mark by using the term disease rather than pathogen or by describing the cells 'engulfing the disease', 'digest the disease' or 'swallow them up'.

The functions of antibodies were often badly described, eg 'antibodies kill off any antigens', 'antibodies produce antitoxins', 'antibodies neutralise the antigen', 'antibodies engulf infection', 'it produces antigens which swallow up the pathogens', 'they build a wall in our immune system that helps fight off the disease', 'white blood cells kill the antibodies'.

Many candidates attempted answers in terms of immunological memory but answers were usually weak, eg 'the body remembers it', 'they learn how to fight them'.

Significant numbers of candidates answered in terms of vaccination. Others described how scabs are formed, usually incorrect detail such as 'white blood cells clot the blood'.

Question 4 *(Standard Demand)*

(a)   Only a minority of candidates were able to give a full definition of sustainable development. Some centres had provided their students with an acceptable definition to learn, but of the remainder, the only mark gained was for a reference to the prevention of environmental damage.

(b)   Over half of the candidates gained full marks for this question. In most cases candidates who failed to gain full marks either duplicated the same marking point or gave responses that were not specific enough, eg 'turn off switches', 'use less energy', 'reduce carbon emissions', 'use less electricity', 'use less energy' 'use less water' 'reduce amount of waste'.

Question 5 *(High Demand)*

(a)   Although most candidates gained one mark, usually for 'craving' or 'withdrawal symptoms', most candidates failed to gain two marks because they wrote in terms of dependency without explaining the cause of the dependency in terms of the effect on body chemistry. Those that failed to score any marks usually did so because they talked in general terms of the drug making you 'high / relaxed' or having a 'need'.

(b)   (i)   Whilst most candidates were able to relate peak usage to age, relatively few related minimal use to age.

(b)   (ii)   Most candidates gained at least one mark, usually for 'peer pressure'. Where candidates did not gain full marks it was usually for including a response relating to 'stress'.

(b)   (iii)   The vast majority of candidates gained at least one mark. The first marking point was by far the most commonly awarded with fewer candidates scoring the second point. Some candidates were confused between accurate and reliable, with a number commenting on points relating to reliability, eg sample size, at the expense of accuracy.
                Most candidates scoring at least one mark generally by referring to dishonest answers. Significantly fewer candidates were able to make the link with the drugs being illegal, many being content to state that the survey was done on line.

Question 6 *(High Demand)*

It was disappointing to find that only a tiny minority of candidates were able to gain full marks on this question. Most candidates limited their marks by only answering in generic terms, having experience of previous mark schemes. These candidates did not go on to apply the knowledge to the particular circumstances of this question.

Most candidates gained credit for referring to mutation or to variation in the sheep.
Many referred to climate change, but failed to state the direction of change. Many stated that the climate would be colder.
Very few candidates gave satisfactory answers in terms of adaptation. Far too many stated that smaller sheep would have a smaller SA/V ratio. Many candidates answered in terms of the lack of humans to feed the sheep. Other candidates stated that being smaller enabled the sheep to be nearer to the grass. Many Lamarckian statements were made.
Most candidates correctly stated that the small sheep would breed and pass on their genes to the offspring.

Question 7 *(High Demand)*

(a)   It was pleasing to note that the majority of candidates gained both marks. However, misconceptions abounded: 'asexual involves plants, sexual humans', 'asexual is not having sex, sexual involves sexual intercourse', 'sexual requires physical contact, asexual does not', 'sexual is natural, asexual is not', 'sexual is done naturally, asexual is done in a laboratory with sperm & egg', 'asexual requires one gamete, sexual needs two'.

(b)   Only a minority of candidates gave a full explanation. Many candidates had a good idea of what a clone was but most marks were lost because candidates simply repeated answers they had already given in part (a), eg 'genetically identical offspring', 'clones only have one parent'. Many candidates did state that the nucleus came from just one adult but then did not state it was placed in an empty egg cell. In fact, most marks were lost by failing to state that the egg used is enucleate. A large number of candidates confused cloning with IVF.

Question 8 *(High Demand)*

(a)   Most candidates obtained at least one of the two available marks. There were, however, quite a few generic responses with candidates stating the roles of hormones in the menstrual cycle. Many candidates discussed the role of LH in their response. There was some misunderstanding about the function of FSH with a number of responses stating that the egg would not 'develop' or 'be produced', which were insufficient for a mark.

(b)   It was pleasing to note that over half of the candidates gained 3 or 4 marks. Where candidates read the information and realised that the question was asking for a comparison, they generally achieved full marks and wrote their points clearly and logically using comparative terms like 'whereas', 'however' and 'on the other hand'. Alternatively, a number of students used the superlative in their comparisons, eg 'more effective'.
Many candidates have become very accustomed to listing the pros and cons of different methods followed by an argued conclusion. Candidates who used this approach usually failed to demonstrate comparisons.
The conclusion mark was achieved by the majority of candidates. In fact, many candidates who did not do a comparative answer for their evaluation were still able to achieve the conclusion mark for stating which method they felt was better and why.

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

UMS conversion calculator www.aqa.org.uk/umsconversion