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General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H Unit Biology 1

Report on the Examination

2010 examination – January series

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Science B / Biology
Higher Tier BLY1H

General

There were eight questions on the paper. Questions 1 to 4 were Standard Demand and of these questions 2 and 3 were common to Foundation and Higher Tiers. These four were targeted at grades C and D. 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 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)*

Nearly all candidates correctly identified at least one adaptation and most of these were able to give at least one correct explanation.

The majority of candidates realised that the most obvious adaptations would be related to the cold climate although the advantage given was often vague, for example to help it survive. Many candidates tried to ascribe adaptations learned for other animals in other situations that could not be gleaned from the photograph of the musk ox. Thus no credit was given for the frequent statements it is small so can hide, it has a layer of fat for insulation and it has wide feet to spread weight on snow.

There were many answers based on the size of the ox although some just repeated the measurements given in the question and others simply wrote size without pointing out that it was large. There was much confusion over how to state small SA:V ratio and many indicated the reverse or something quite strange such as small body to volume ratio and small weight to mass ratio. The advantage of being large was usually understood although the vague phrase to keep warm occurred frequently. On a number of occasions it was thought that its size helped the ox to absorb heat. Thoughtful candidates realised that its size would pose a problem for predators.

The presence of horns was noted in a number of responses and although most gave for defence many others imagined that they were used to kill their prey.

Question 2 *(Standard demand)*

(a) Two thirds of candidates gained two marks for an explanation of natural selection and a further fifth gained one mark. The majority of candidates gained one mark for the statement survival of fittest. The second mark was generally gained for a correct reference to adaptation, although many implied that organisms choose to adapt. A minority of candidates stated that survivors would go onto breed or would pass on their genes.

(b) Almost half of the candidates correctly described two trends and a further third correctly described one trend. The most common error was to describe something that did not change eg still has skull and pelvis. Many candidates failed to gain credit because they just stated that a structure changed, without saying what the change was eg the skull changed or the shape of the pelvis changes.

(c) A quarter of candidates gave two correct reasons and a further half gave one correct reason. The most common correct reason was a reasonable reference to religious objections closely followed by the idea of that Darwin had no proof. Many candidates made the incorrect statement that Darwin had no evidence and numerous candidates stated that people believed in Lamarck's theory. Other candidates stated that people did not want to be descended from apes or that apes are still alive.

(d) A fifth of candidates gave a creditworthy difference between the two theories. Most candidates had difficulty expressing ideas clearly. Weaker candidates merely restated the question. Many candidates stated that Darwin takes a long time, Lamarck is quick.

Question 3 *(Standard demand)*

(a) Just under half of candidates appreciated that the question was about accuracy. Successful candidates mainly referred to smaller intervals between readings or sampling above ½ m. Weaker candidates described improvements to reliability eg repeating readings or doing transects in different towns or different parts of the same town.

(b) Most candidates demonstrated good understanding of the data, with nearly all of candidates correctly choosing Parmelia and only a few less correctly choosing Evernia.

(c) Only a few candidates gave two correct reasons. A further half gave one correct reason. Most successful candidates correctly stated that Lecanora does not grow over the whole range. The second most common correct response was that other factors may influence the distribution. Although many candidates did appreciate that Lecanora was not growing over the whole range many others simply quoted figures for the size of its range and failed to indicate that there were areas where it was not found. Although many candidates did appreciate that Lecanora was not growing over the whole range many others simply quoted figures for the size of its range and failed to indicate that there were areas where it was not found. Many candidates explained why Lecanora was not a good indicator on the basis that one of the other lichens would be better. Many

students showed a lack of understanding and did not realise that the important point about the distribution of the lichen was that it did not grow everywhere. Many only described where it did grow.

Question 4 *(Standard demand)*

(a) The majority of candidates correctly stated the purpose of pre-clinical testing, the most common response being the cover all to see if it's safe. There were, however, many references to testing for side effects.

(b) (i) Over half of candidates correctly stated the main purpose of phase 1 testing. Unsuccessful candidates generally stated to see if it's safe.

(b) (ii) A similar number of candidates gave a correct reason for using healthy volunteers. Most of these candidates stated that it was safer than using a patient. Others correctly stated that the side effects would be clearer.

(c) Two thirds of candidates gave a reasonable statement about the purpose of phase 2 and phase 3 testing although only in small minority referred to optimum dosage. The majority gained credit for referring to the larger sample size or referring to testing the drug on patients. The commonest source of errors was the reiteration of to see if there are side effects, to see if the drug works, to make sure the drug is safe.

(d) (i) The majority of candidates gave a reasonable description of a placebo. In many instances the word drug was used to mean pill or tablet which gave rise to statements such as this is a drug which is not a drug. Many candidates answered in terms of the role of the placebo and a significant number of these imagined that it was administered to help with side effects or to relieve stress or in case they pretend to be better. Some students incorrectly stated that a placebo is a drug that doesn't work or affect the body. This could not be credited as students should know that a drug is a substance that has an effect on the body chemistry, as stated in the specification.

(d) (ii) Only a fifth of candidates correctly chose neither patients nor doctors. The vast majority chose only the doctors.

Question 5 *(High demand)*

(a) A tenth of candidates gained two marks and nearly half gained one mark. Successful candidates generally referred to the rate of chemical reactions or the rate of energy release. Only a minority stated that these processes occurred in cells or tissue. Unsuccessful candidates generally referred to the rate of digestion, the rate of weight loss or the rate of burning fat.

(b) A third of candidates gained three marks, a further quarter gained two marks and a further tenth gained one mark. Successful candidates generally gained two marks for stating that LDL is bad cholesterol and HDL is good cholesterol. The better candidates also stated that the balance of HDL to LDL is important for heart health. Large numbers of candidates gave vague statements about LDL carrying cholesterol to the cells and HDL carrying cholesterol to the liver.

Cholesterol was variously described as building up in arteries, veins and capillaries.

Question 6 *(High demand)*

(a) Most candidates gave a reasonable description. Common unacceptable answers included stating that viruses break down or attack immune systems, viruses attack, invaded or enter cells. Many candidates referred to viruses invading white blood cells.

(b) A quarter of candidates gained three marks, nearly half gained two marks and a quarter gained one mark. Better candidates demonstrated sound understanding of the principles of immunity. Even these candidates frequently confused antigens and antibodies. However, many referred to weak defence system, low resistance and fighting diseases. It was surprising that more candidates did not suggest that the disease had been passed on to the Indians by the TV crew. A large number of candidates assumed that wealth, hygiene, lifestyle etc influenced the effect the disease would have ie the TV crew would automatically be in a better position to deal with flu because they had better food, or because they washed their hands in disinfectant gels, or that the tribes were already weak from other diseases and so had less resistance. Many stated that the TV crew would have medicines for it whereas the Indians would not. Weak candidates often stated that the tribe had got the disease from food or water which of course the crew did not get because they ate and drank different food and water.

Question 7 *(High demand)*

(a) The vast majority of candidates knew the sources of the two hormones.

(b) (i) Surprisingly only half of candidates gave a correct proportion. Most incorrect answers were based on a fertile period calculated as 8 days. Many candidates quoted a ratio of 1:4 rather than a proportion.

(b) (ii) A few candidates gained two marks and a further half gained one mark. Most of the successful candidates recognised that day 17 was in the fertile period. However many candidates stated, contrary to the evidence from the graph, that ovulation occurred on day 17. This was probably due to the widespread confusion between fertility and fertilisation. Other acceptable answers involved reference to the build up of the womb lining and reference to the longevity of sperm cells. Many candidates ignored the graph altogether and gave answers involving ovulation on day 14.

(b) (iii) Only a few candidates gained two marks and a further fifth gained one mark. The most commonly awarded mark was for stating that oestrogen stimulates production of LH and many candidates were also able to indicate the role played by oestrogen in building up the lining of the womb. Most candidates experienced difficulty in explaining that a wider fertile period could be detected and many implied that this monitor would actually make them fertile for longer. Some candidates suggested that the monitor supplied extra hormones. A considerable number of responses included little more than the information given in the question, statements such as it gives more information because it shows both and it shows two hormones so is more accurate, were very common.

(c) A tenth of candidates gained two marks and two thirds gained one mark. Most candidates realised that the lines on the graph for the two hormones had a similar pattern. However, few went on to state that the line for oestrogen peaked before that for LH.

Question 8 *(High demand)*

(a) Less than half of candidates gave chromosome. Most answers referred to genes, DNA or the nucleus itself.

(b) Hardly any candidates gained all four marks. A tenth gained three marks, a quarter gained two marks and a third gained one mark. A significant minority of candidates did not attempt this part of the question. The majority of successful candidates gained at least two marks for advantages, usually by stating that rabbits produce lots of eggs and that the research could lead to a cure. Very few candidates gave points against this research, and when they did simply made statements like it is unethical or against God which did not gain credit. Again hardly any candidates gained a mark for a conclusion. Many simply either gave their own opinion or just repeated points that had been previously made.

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