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General Certificate of Secondary Education

Biology 4411

BLY3F Unit Biology 3

Report on the Examination

2010 examination – January series

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Biology
Foundation Tier BLY3F

General

Particular problems which occurred quite frequently included:

- the inability to express ideas clearly and unambiguously, such as patterns shown in data or linking an observed effect to its specific cause
- excessive verbosity rather than making specific points succinctly and precisely as this merely wastes time as no marks are available for re-stating the question nor for making the same point more than once
- paying insufficient attention to information provided in the stem of a question in order to guide a reasoned response
- careless reading of the question resulting in an inappropriate answer eg the distinction between the instructions 'Describe...' and 'Explain...'
- not reading data accurately from a graph, or selecting the wrong part of the data
- mathematical weakness in calculations
- poor understanding of certain topics, such as digestion and absorption, diffusion, kidney function.

Question 1 *(Low demand)*

This question was well answered by most candidates.

(a) Most recognised the structure in the diagram as a villus, although the other distracters proved effective. Just fewer than half the candidates were able to identify three ways in which the villus was adapted for food absorption, although nearly all candidates were able to identify at least one feature. Some candidates ticked only one or two boxes, rather than the three as instructed.

(b) Nearly three quarters of candidates correctly identified diffusion as the process by which soluble food enters the blood.

Question 2 *(Low demand)*

(a) This section proved accessible to the vast majority of candidates who correctly identified the inoculating loop, knew that the heat-treatment steps were the ones that killed microorganisms and the meaning of the term incubation.

(b) Only half the candidates knew that carbohydrates (as opposed to mineral ions or vitamins) were a source of energy for the growing microorganisms.

Question 3 *(Low demand)*

(a) That repetition of an experiment made the results more reliable was a concept known to just under half the candidates. Accurate was a common incorrect answer.

(b) Many candidates described the results rather than explaining them. There were also many answers about the presence or absence of oxygen causing the difference in the

results. Only a fifth of candidates were able to give a complete explanation in terms of the entry of bacteria being prevented in Flask A but allowed in Flask B.

Question 4 *(Standard demand)*

(a) While the majority of candidates recognised that siting the biogas generator underground meant its temperature would not change very much, the prevention of unpleasant smells from it was the most common incorrect response. Relatively few recognised that the second correct feature in the list was the advantage that the generator could not be seen.

(b) Nearly three quarters of candidates knew that methane was the component of biogas missing from the list and slightly more were able to use the data to calculate that this component made up two thirds of the biogas.

Question 5 *(Standard demand)*

(a) A large majority of candidates recognised that the presence of bacterial colonies close to antibiotics E and F indicated that these did not kill the bacteria, whereas the large clear area around antibiotic D showed that this one was the most effective.

(b) (i) This section was often well answered, with many candidates giving an accurate, detailed description of the graph. However, some insisted in giving an unnecessary explanation of the data as well.

(b) (ii) Nearly two thirds of the candidates offered the correct explanation that 42 hours represented the time of maximum yield of the antibiotic, although some confused the antibiotic with the mould and gave answers referring to a peak of mould growth at 42 hours, which was unlikely to be correct.

Question 6 *(Standard demand)*

(a) Many of candidates did **not** recognise that a 2.2 kilogram loss in weight during a dialysis session was due mainly to the removal of water from the blood (rather than salt or urea), although a large majority did recognise that molecules could only pass through a partially permeable membrane if they were small.

However, relatively few appreciated that the blood would come into equilibrium with the dialysis fluid and so should end up having the same concentration of sodium ions as this fluid.

(b) Only half the candidates were able to do the calculation correctly, giving the answer that, during the first year, dialysis cost £21 000 less than a transplant. A common incorrect answer was £26 000 due to candidates not having read the information in the table with sufficient care and thus including inappropriate data

(b) (ii) Two thirds of candidates correctly selected 2 years as the time it would take for a kidney transplant to prove less expensive than continued dialysis treatment.

(b) (iii) Less than half were able to express unambiguously why it is necessary for a transplant patient to take immunosuppressant drugs.

Question 7 *(High demand)*

(a) Nearly three quarters of candidates were able to select the correct blood vessels from the diagram, with slightly more success for recognising which carried oxygenated blood than which was an artery.

(b) Only a tenth of Foundation Tier candidates scored full marks in this question, although many could make at least one relevant point. The majority of candidates included irrelevant information about breathing, and some confused breathing and respiration. A surprising number wrote that the heart rate increases to supply the lungs with oxygen. As ever, one of the most common correct points was the increased rate of transport of oxygen, with relatively few realising that an increased food supply (eg glucose) would also be needed during exercise and that carbon dioxide, lactic acid and heat would need to be removed.

Question 8 *(High demand)*

Answers to this question were very poor, with few candidates appreciating what was happening.

(a) Some candidates described the pattern in the graph, rather than explaining the relevant feature. Some thought that, at 70 minutes, the yeast was used up or denatured. Many did not appreciate that carbon dioxide was still being produced and that it was only the rate of production that had declined. The concept of the yeast having used up the sugar in the mixture was one that did not occur to the vast majority. Only a minority scored any marks.

(b) Many candidates were unable to make the connection between enzymes similar to those in germinating barley grain and the digestion of starch in the flour. Some even thought that barley grains were germinating in the bread dough mixture (more careful reading of the question would have eliminated this possibility).

It was a rarity to read of enzymes being used to digest the starch to sugar so that the rate of respiration could increase again, thus producing carbon dioxide at a higher rate. A common misconception was that the enzymes were actually respiring rather than the yeast.

Question 9 *(High demand)*

(a) Under a half of the candidates were able to work out from the data that Leaf C had lost the most water.

(b) Only a sixth knew that cell X was a guard cell.

(b) (ii) Many answers did not even refer to stomata but merely to the loss of water through the lower surface of the leaf. Some candidates wrote that the upper surface was already waterproof so the petroleum jelly would have made no difference. Just over a quarter were able to write anything relevant in terms of

water leaving the leaf (mainly) via the stomata and that, in this species, the stomata were found only on the lower surface.

Actually, knowledge of the term stomata was not really necessary, the concept of pores (or even holes) would have sufficed. A common misconception was that water entered the leaf via the stomata, although how this could result in a decrease in mass, as shown by the data, was not clear.

Mark Ranges and Award of Grades

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