edexcel

Examiners' Report/
Principal Examiner Feedback

Summer 2016

Pearson Edexcel International GCSE
Biology (4BI0) Paper 1B
Science Double Award (4SC0) Paper 1B

Pearson Edexcel Level 1/Level 2
Certificate Biology (KBI0) Paper 1B
Science Double Award (KSC0) Paper 1B

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2016
Publications Code 4BI0_1B_1606_ER

Examiner's Report International GCSE Biology 4BI0 1B

The examiners were, once again, impressed by the knowledge and understanding shown by candidates on the papers. Candidates were able to apply their knowledge and understanding, analysis and evaluation and investigative skills to some unfamiliar experiments or to new contexts. Centres have worked hard to prepare students for the examination and this was evident in the responses of candidates. Few candidates failed to attempt all questions. There is little or no evidence of candidates being short of time on this paper.

The first question 1 (a) gave candidates a diagram of a neurone. Most candidates were able to give three structures found in a plant cell that are not found in a neurone. This provided a gentle introduction to the paper with many gaining full marks. In part (b) (i) candidates needed to identify components of a reflex arc from a diagram. Candidates earned a range of marks with about 50% gaining full marks. The most common structure that candidates failed to name correctly was the receptor. In (b) (ii) most could identify the gap between neurones as the synapse. In (c) most candidates were able to calculate the time taken for the impulse to travel from spine to foot with any errors coming in their use of units.

Question 2 gave candidates a graph showing the changes in the global production of farmed fish and beef cattle from 1950. In part (a) they had to describe these changes. While the majority of candidates were able to score marks on this item, only the best were able to earn full credit for describing the increase in beef production, the slow increase in fish production which gathered pace and then overtook beef production after 2010. Item (a) (ii) required the calculation of the mass of farmed fish expected to be produced in 2020. Most could read the 1990 value from the graph and use this to derive the correct answer. Part (b) asked candidates to describe what happens to fish protein in the human stomach. This discriminated well between the candidates with the most able scoring full marks for describing the role of protease in digesting the protein into peptides and amino acids and the role of hydrochloric acid to provide an optimum pH for the enzyme reaction. In part (c) candidates had to complete a table that table listed some protein molecules, the function of each molecule and the place where each molecule is made. Again this item produced a range of scores with most responses earning 4 marks or better. The most common errors were not recognising antibodies as proteins and vague descriptions of the role of insulin.

Question 3 gave students data on emission of greenhouse gases. In part (a) (i) most students could give a source of nitrous oxide but fewer correct responses were seen in part (ii) with many giving a gas stated in the stem even though they were clearly asked for another greenhouse gas. In part (b)(i) most students were able to calculate the percentage decrease in the mass of carbon dioxide released between 1990 and 2010, although some candidates just copied the list of numbers from their calculators. In part (ii) most could also make some suggestions as to why of carbon dioxide released has decreased from 1990 to 2010. Only the best

candidates scored full credit for responses that mentioned for example planting more trees, less fossil fuels burned, more use of public transport and use of alternative energy sources such as wind or solar. In part (b) (iii) candidates were asked to describe the changes in the mass of methane released between 1990 and 2010. Most scored one mark with only the very best students referring to the large reduction in methane from 1990 to 2005 and the smaller reduction from 2005 to 2010. In part (c) candidates had to explain the advantages of reducing the mass of greenhouse gases released into the atmosphere. Although this topic is understood by most students they need to ensure that they link their knowledge of global warming to the context of the particular question, in this case a reduction in greenhouse gases. Some wrote about the ozone layer of effects of acid rain.

Question 4 gave candidates a simple food chain and in part (a) almost all could correctly identify the producer and secondary consumer. In part (b) (i) most candidates could also correctly identify from the photograph the eye structures and in (ii) complete the table to name the part of the eye from the description. In part (c) (i) most candidates were able to state what is meant by population. In (ii) most responses were able to describe natural selection, but once again, not all the students linked this to explain the changes in the snail population. This item discriminated well between candidates with the very best scoring full marks for a clear explanation of how natural selection produces the changes shown.

Question 5 was the experiment design item and this also discriminated well with only the top candidates scoring full marks. Common errors included not specifying how long the eggs are stored for, waiting for the eggs to hatch, referring to keeping all other factors the same and failing to indicate how survival is to be measured. Other errors included giving irrelevant control variables, such as light intensity, without thinking about what might factors influence the survival of a mammalian embryo.

Question 6 provided students with data about the effect of stomatal pore size on rate of transpiration in still and moving air. in part (a) (i) many students were unable to explain the role of stomata in transport but were able to explain their role in gas exchange in (ii). The best students could describe the loss of water setting up a transpiration stream and drawing water up from the roots and how carbon dioxide enters and oxygen exits the pores by diffusion during photosynthesis. Most candidates were able to gain high marks for the graph in 6(b) (i) and were also able to describe the effect of increasing pore size on transpiration rate in still and moving air in (b) (ii). The response in (iii) were much poorer with many candidates merely describing the effect of moving air on transpiration rather than explaining the effect in terms of removing moist air to increase the concentration gradient and thus speeding up diffusion.

Question 7 required candidates to complete a passage on tissue culture in plants. Only a small percentage gained full marks with the most common omissions being explants and culture medium.

Question 8 gave candidates data on heart rate before and after exercise. In (a) (i) most candidates were able to correctly calculate the average heart rate after exercise. Surprisingly in (ii) many candidates failed to identify the child with the anomalous result in the data for heart rate just before exercise. In part (iii) most could correctly suggest that the rate just prior to exercise was due to the effects of adrenaline increasing heart rate. In part (iv) most candidates were able to identify a control variable but only the best could correctly name two. Candidates need to consider the context of the question as some variables suggested would have no effect or could not easily be controlled. The next item 8(b) required candidates to suggest why athletes may have a low resting heart rate. This discriminated well across the range of abilities, so while most candidates gained some marks, only the very best scored full credit. The best responses recognised that athletes who trained frequently will increase the size of their heart. They could then pump a larger volume of blood in each beat and thus need fewer beats per minute to deliver the same volume of blood containing oxygen for aerobic respiration.

Question 9 (a) gave students a table showing features found in three groups of living organisms. Students needed to indicate the presence or absence of the structures from each group. This item also discriminated well between candidates, even though this should be simple recall from the specification. In (b) (i) almost all candidates could name another type of pathogen but in (ii) many could not name a disease caused by a protoctist.

Question 10 (a) gave candidates a diagram of the female reproductive organs and candidates had to name the structures labelled in the diagram. This proved easy for most candidates many of whom earned full marks. In part (b) candidates were given a graph of oestrogen and progesterone changes during the menstrual cycle and needed to indicate on the graph the point of ovulation and the start of menstruation. Most were able to do this but some had no idea and randomly placed the two letters. In part (b) (iii) candidates were usually able to describe the changes in the uterine lining during the cycle. In part (c) candidates were asked to explain why abstaining from sexual intercourse at certain times of the cycle may not be a reliable method of contraception. The best candidates earned full credit for explaining that the timing of ovulation may vary and that sperm may survive in the woman for some time. In part (d) many gained full marks for describing the role of oestrogen at puberty.

Question 11(a) asked candidates to explain which parent determines the sex of the baby. Most response gained full credit but a significant number thought it was either both parents or the mother who determined the sex. In (b) candidates had to describe how cell division by meiosis is different from cell division by mitosis. The majority of answers earned 3 or 4 marks. Most candidates knew the differences between the processes but some were unsure of which was mitosis and which was meiosis.

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE