edexcel

Examiners' Report/ Principal Examiner Feedback

Summer 2016
Pearson Edexcel International GCSE in Biology (4BI0) Paper 2BR

ALWAYS LEARNING PEARSON

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_2BR_1606_ER
All the material in this publication is copyright
© Pearson Education Ltd 2016

Examiner's Report International GCSE Biology 4BI0 2BR

The examiners were impressed by the knowledge and understanding shown by most candidates on the papers. Candidates could 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 most candidates. Only a few candidates failed to attempt all questions. There is no evidence of candidates being short of time on this paper.

The first question 1 asked questions based upon the passage about control of blood glucose. Most candidates were able to link the novel information provided in the passage to their existing knowledge of blood glucose control. In part (a) most candidates were able to gain both marks for explaining that digestion is the breakdown of large insoluble molecules into smaller soluble ones. In part (b) they were asked to explain why dogs that had their pancreas removed produced urine that contained glucose. This application of existing knowledge to new information proved more challenging and only the best candidates gained full marks. The best answers linked the absence of a pancreas with inability to produce insulin and thus failure to reduce blood glucose levels leading to failure of effective reabsorption of glucose in the kidney. In part (c) most candidates were able to name two enzymes produced by the pancreas, the most common error being naming of hormones. In item (d) candidates were asked to suggest why rabbits that have had their pancreatic duct tied can still regulate their blood glucose levels. About one third of candidates were able to recognise that since regulation of blood glucose is controlled by hormones, these are released into the blood stream and not via ducts. Part (e) candidates were asked to suggest a control for the scientists to use in the experiment that injected pancreatic enzyme into dogs that had their pancreas removed. Only the best responses scored full marks for suggesting injecting a control group of dogs with a suitable liquid without the extract and comparing the responses in glucose control between the two groups. In part (f) only about 30% of candidates could correctly name the blood vessel that transports hormones into the liver, even though this is clearly stated in the specification. In (g) however most candidates were able to give an advantage of storing glycogen in cells rather than storing glucose in cells. Part (h) asked candidates to identify the stimulus, receptor, effector and response in the mechanism of blood glucose control. Most candidates could identify the response and the effector and fewer the stimulus and fewer still the receptor.

Question 2 gave candidates pictures illustrating seven stages in a method for making yoghurt. In part (a) almost all candidates could correctly identify the stages were competing bacteria are killed. In (b) most responses gained some credit for explaining why the milk needed to be cooled to 45 °C in stage 3. Only the top candidates were able to gain both marks for the idea that a high temperature would either kill the *lactobacillus* or cause their enzymes to be

denatured. In part (c) most candidates were able to obtain full marks for explaining that other bacteria would contaminate the yoghurt or compete with lactobacillus to use the lactose if the jars were not sterilised. In (d) most responses could explain what would happen to the production of yoghurt if the water cooled below 35 °C in stage 6. In part (e) less than half of candidates were able to identify vitamin C as the reason fruit is added to yoghurt to help maintain healthy skin.

In question 3 candidates were given a table showing the concentration of sodium ions and chloride ions inside a plant root hair cell and in the water in the soil. In part (a) (i) almost all candidates were able to calculate the ratio for the concentration of chloride ions in the root hair cell compared to the water in the soil. In (ii) most candidates could score some credit for explaining why too much water in the soil would prevent root hair cells from absorbing sodium or chloride ions. The best candidates were able to explain that lack of oxygen would prevent respiration and thus prevent active transport of ions into the plant. In (b) most candidates were able to complete the table by naming a molecule that is made in plants using nitrate ions and using magnesium ions.

Question 4 gave candidates a description of an experiment to investigate the factors required for seed germination. In part (a) students had to complete the table to show the factor being tested and whether the seeds are likely to germinate. About half of the candidates gained full marks with almost all gaining some credit. In (b) (i) most candidates could suggest how the students could see if germination had taken place. In (b) (ii) candidates were asked to name two variables that the teacher should control in his experiment. Most candidates could name one or two variables. In part (c) (i) candidates needed to suggest a molecule that could be used as food store in the seed. Most gave starch or lipid with a few answers suggesting glycogen perhaps being influenced by the passage earlier in the paper. In (ii) most candidates could explain why it is important for seeds to have a food store. The best answers explaining how lack of light and lack of leaves precludes photosynthesis so the stored starch is respired until photosynthesis can start. Part (d) asked candidates to describe an experiment you could carry out to determine the energy content of a seed. The examiners were impressed by the high standard of answers on this item with many candidates scoring full marks for clearly written and detailed accounts of their experiments.

Question 5 gave candidates a simple diagram of the water cycle. In (a) almost all could correctly identify evaporation, transpiration and precipitation from the diagram. In (b) (i) most candidates were able to explain the consequences of deforestation on the water cycle as reduced transpiration leading to less cloud formation and les precipitation. However, in (ii) candidates did less well in explaining the effects of deforestation on the carbon cycle. This item discriminated very well between candidates with only the very best responses scoring full marks. The best responses explained how less photosynthesis would

lead to more carbon dioxide in the air and that there would be less food for animals that feed on plants and less decomposition of leaves.

Question 6 gave candidates a diagram of two specialised cells, a sperm cell in (a) and a motor neurone in (b). In (a) candidates were asked to suggest the function of the (i) head containing enzymes, (ii) the middle piece containing mitochondria and (iii) the tail. In (i) most candidates were able to gain credit for describing digestion of the cell membrane of the ovum but only the best candidates referred to the delivery of the male chromosomes or alleles. Some candidates referred to the egg as having a cell wall. In (ii) most could describe the site of respiration in order to provide energy for the cell. Almost all responses could correctly describe the role of the tail in (iii). In part (b) candidates needed to suggest two ways in which the structure of the motor neurone is adapted for its function. Most candidates were able to obtain at least one mark for this, with answers suggesting the myelin sheath to speed up impulses and dendrites to allow synapses with other neurones.

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