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Examiners' Report November 2008

IGCSE

IGCSE Biology (4325)

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November 2008

Publications Code UG020611

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4325 Biology Paper 1F

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Biology 4325 2H** for feedback relating to common questions.

4325 Biology Paper 2H

General information

This paper was taken by a much smaller number of candidates than in the summer. However, the examiners were once again impressed by the abilities of the candidates to apply their knowledge and understanding of Biology to a wide range of situations. Most candidates attempted all of the questions and there was no evidence of candidates running out of time on the paper.

Questions 1-6 also appear on the foundation level paper.

Question 1 required candidates to label parts of a fungal hypha. Most were able to gain credit but some were confused by the presence of many nuclei and labelled these as chloroplasts. The second part of the question required candidates to complete a table to identify the enzymes secreted by the fungus that would produce maltose. Most could correctly name amylase although some suggested maltase. Almost all could correctly identify amino acids or peptides as the product of digestion by protease and lipase as the enzyme that produces fatty acids and glycerol. The final part of the question required students to fill in the blanks in a passage about the role of fungi in the carbon cycle.

Question 2 presented candidates with a centrifuge tube showing some spun blood. Most were able to identify plasma and white blood cells and to give their functions. Almost all could identify red blood cells but were not always able to explain that a loss of blood would lead to a lack of oxygen reaching the brain.

Question 3 showed candidates a simple experiment set up to examine the factors required for germination of a bean seed. Most could correctly identify tube A as the tube in which germination would take place. Some weaker candidates chose tube C believing that oxygen is released by 'an absorber' or that seeds grow best without oxygen. The best answers explained that a suitable warm temperature, water and a supply of oxygen are required to activate enzymes to enable digestion and respiration of the seed's food store. Most candidates could identify starch and explain that this is digested to glucose and used to provide energy by respiration.

Question 4 concerned biological control. The first part asked candidates to draw a food chain to show how ladybirds can feed on aphids that eat the leaves of tomato plants. Most candidates could correctly produce the food chain but some drew a pyramid and others put the arrows the wrong way. Almost all were able to explain how the aphids would eat the leaves leading to a reduction in photosynthesis and a reduction in crop yield. Most could also identify biological control and explain the disadvantages of using pesticides on crops. Some candidates still believe that the pesticide would harm the crop.

Question 5 required candidates to describe the stages used to produce 'Snuppy' a cloned dog. The best responses were able to gain full credit but others confused cloning with genetic modification and wrote about cutting and inserting genes. The examiners expected a simple account of how an egg cell is enucleated and into this is inserted the nucleus from one of Snuppy's father's skin cells. An electric shock is used to stimulate mitosis and the embryo is grown 'in vitro'. This embryo is then implanted into the uterus of a surrogate mother.

Question 6 was about the inheritance of Huntingdon's disorder. The first part required candidates to explain the meaning of the term homozygous recessive. Most could explain that homozygous means having two alleles that are the same and the better candidates could explain that recessive means only affecting the phenotype in the homozygous condition or that the alleles were not dominant. The second part required candidates to produce a genetic diagram to show the gametes, genotypes and phenotypes of a marriage between a homozygous recessive male and a heterozygous female. Most candidates gained credit with the most common error being to omit the gametes or to write genotypes instead of phenotypes. In the final part almost all could name the brain and the spinal cord as the two main parts of the nervous system and describe how impulses are transmitted through neurones and across synapses.

Question 7 described the experiment carried out by Bertold on cockerels. In the first part candidates had to suggest why a castrated cockerel would develop a different appearance. Many were able to explain that the removal of testes would prevent the release of testosterone and thus prevent the development of secondary sexual characteristics such as comb, wattle and aggressive behaviour and crowing. In the next part the better responses explained how the transplanted testes could release testosterone into the blood and thus cause the cockerel to develop male characteristics. In the final part most answers mentioned growing fatter but few discussed surface area or heat loss.

Question 8 asked candidates to describe ultrafiltration and selective reabsorption. The best response gained full credit for describing how small molecules are forced under pressure out of the blood and into the Bowman's capsule. They also described how certain required molecules such as glucose are reabsorbed back into the blood from the tubule. The candidates were also required to calculate the percentage of filtered water that is reabsorbed. The better candidates could identify which part of the kidney is used to reabsorb the glucose. The final part of this question asked candidates to describe the changes in the volume and concentration of urine produced following exercise on a hot day. Most were able to gain credit for a lower volume of more concentrated urine. This was explained by an increase in blood concentration stimulating the osmoreceptors in the hypothalamus leading to an increased secretion of ADH from the pituitary gland. This produces an increase in permeability of the collecting duct wall causing an increase of water reabsorption.

Question 9 required candidates to complete a table to compare the features of insect-pollinated flowers and wind-pollinated flowers. Most candidates gained good credit for their differences. The second part of the question required candidates to explain why the gametes are genetically different from each other and from the rest of the plant cells. Only the very best candidates were able to explain how meiosis produces haploid gametes which contain half the chromosomes of the parent plant cells and show different combinations of alleles. Finally the question required candidates to give an advantage and a disadvantage of self-pollination when compared to cross-pollination. The best answers explained that self-pollination is more likely to occur as it does not rely on a vector, but self-pollination reduces the amount of genetic variation in the offspring so they are less able to adapt in a changing environment. Some candidates seem to think that self-pollination would produce no genetic variation and that it is a form of asexual reproduction. Others confused cross-pollination with seed dispersal.

Question 10 gave candidates a graph of the results from an experiment on the role of 'accessory food factors' on growth in young rats. Most were able to describe the change in growth from day 18 in each group. They were also able to give a suitable conclusion from the experiment. Only the very best candidates were able to explain that the diets were swapped to ensure that differences between the rats in each group did not cause the different growth patterns. Candidates did better at suggesting a suitable variable to control and matching the vitamin to sources and functions in the table.

Question 11 provided candidates with a diagram of the human gut. Most were able to correctly identify the parts of the gut where the pH changes from 7 to 2 as the stomach. They did less well at identifying where enzymes are secreted or where absorption takes place. Most could correctly identify the anus as the site of egestion. Most candidates were able to give one or two functions of bile.

Question 12 required candidates to explain the consequences of fertilisers being washed into a lake. This series of stages should be familiar to candidates and most gained credit for their explanations.

Question 13 presented candidates with a woodland food web. Almost all candidates were able to identify a primary consumer and most could name the four tertiary consumers in the web. In part two the better responses were able to explain that it is an advantage for a stoat to feed on a variety of organisms as it is protected if the numbers of one prey decline. Ideas about providing a more balanced diet were also credited. In part (c) many candidates could explain that the woodmouse could not be placed in one trophic level because it feeds on producers and primary consumers and therefore is both a primary and a secondary consumer. The final part asked candidates to explain why food chains rarely have more than five trophic levels. Many responses correctly referred to loss of energy by heat loss, movement etc and that by the time the fifth level is reached little energy remains.

Question 14 was a simple structured question on fish farming. Candidates who were familiar with the material had no problem gaining good marks. The responses varied by centre and some candidates seem to have little knowledge or understanding of this section of the specification.

4325 Biology Paper 03

General information

The paper was felt to be of a similar standard to those set previously. The candidates' performance was felt to be similar to that of the previous series. The paper discriminated well, with a very wide range of marks seen. The full range of marks was seen for each part of each question.

Question 1

This was an easy start to the paper – a practical question about measuring volumes of liquids.
Many candidates scored full marks, although a few did not realise that actual numerical answers were required to part (b).

Question 2

This question tested the candidates' knowledge and understanding of food tests.
Part (a) was answered well, although some candidates put microscope and/or funnel as items needed for testing food samples for glucose. Most knew Benedict's test, although some thought iodine was used. The majority of candidates knew that iodine was used to test for starch. A significant number lost the mark in part (b)(iii) as they simply put 'no colour change', rather than giving the colour of iodine itself, e,g, yellow/brown etc.

Question 3

This question required candidates to 'count' plants in quadrats and to demonstrate their analytical and evaluative skills.
In part (a) many gained full parts in (i) by completing the table correctly. However, few were able to spot the correct anomalous result of quadrat B, buttercup in field X. Instead many gave the 0 figure in quadrat B, buttercup in field Y, or circled more than one result. Most candidates were able to give the correct conclusions in part (b), but a minority did not understand the question or compared the wrong items. In (c) most calculated the total area sampled, although some lost their mark by not giving a unit. Many candidates were able to calculate the estimated population size , but others gained no marks or gained one mark for a part calculation.

Question 4

In this question, candidates were required to plot a graph and to describe and draw conclusions from their results.
The majority of candidates gained full marks in part (a). Some had the axes the wrong way round and others did not put a linear scale. Some candidates only described part of the graph and did not comment on the fact that the graph leveled off, thus losing a mark. Part (b) was poorly answered. Only the better candidates gained full marks, with many not understanding why there were changes in breathing rate. Most candidates gained one mark for either suggesting a method of gaining more accurate results – usually by saying get someone else to count – but few gained the second mark by giving a reason for their answer.

Question 5

This question tested candidates' knowledge and understanding of enzymes and also their ability to suggest modifications and to evaluate an experiment.

Most candidates gained one mark in the first two sections of part (a). Only the more able gained the second mark in each. Part (iii) was very badly answered. If candidates gained a mark, it was usually for indicating that more readings should be taken. Only the very best candidates referred to measurements at smaller intervals or around 45 degrees. Part (b) was not answered well. Many candidates wrongly referred to temperature, which was the independent variable. About 50% of the candidates gained one or two marks for indicating a more precise way of measuring carbon dioxide production. Some forgot to explain why 'counting bubbles' was not a precise method, whilst others did this, but then did not give a more precise way.

Question 6

This question tested the candidates' understanding of planning and carrying out an experiment. It was based on how temperature affects transpiration in leaves.

Most candidates scored 3 or 4 marks. It was disappointing that the marks were not higher, as this type of question appears on every paper. Many candidates forgot to give examples of fair testing.

BIOLOGY 4325, GRADE BOUNDARIES

Option 1: with Written Alternative to Coursework (Paper 3)

	A*	A	B	C	D	E	F	G
Foundation Tier				60	48	36	24	12
Higher Tier	77	66	55	44	33	27		

Option 2: with Coursework (Paper 04)

	A*	A	B	C	D	E	F	G
Foundation Tier				64	51	38	26	14
Higher Tier	81	70	59	49	37	31		

Note: Grade boundaries may vary from year to year and from subject to subject, depending on the demand of the question paper.

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