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Biology (9610)
BL01 Biology
Report on the Examination

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REPORT ON THE EXAMINATION: INTERNATIONAL – JANUARY 2026

Many students showed good preparation for this paper, and were using appropriate terminology well. The exception to this was for Question **2.1**, where some students were unable to score well when describing the chromatography experiment. Question **1** was the best answered question and many students showed good knowledge of the comparisons between prokaryotes and eukaryotes such as humans.
Question **4** contained the best discriminators and was also quite well answered.
Question **3.6** was badly answered by some students because they went into too much detail on the mechanism behind the Bohr effect, when the question was just focused on the mechanism of travel of different types of molecule through the cell membranes.
Another example to students perhaps not gaining marks for content that they did actually know was when some did not score well on the exhalation question (**01.6**) because they wrote about inhalation instead. Question **5** produced many weak answers with the ability to link the structure of lipids to their function being once again a problem area for some.
Question **6** was the least well answered question, with many students not understanding some of the principles of classification.

QUESTION 1.1

The majority of students scored both marks, but some mismeasured the line **A**-**B**, so could only score one mark for the correct calculation. Common mistakes were to leave the measurement in centimetres instead of millimetres and then to be out by a factor of 10 in the answer. Most students seemed to know how to use the magnification to calculate the actual size, but converting between units was an issue for others.

QUESTION 1.2

Most students correctly identified the capsule. Of those that did not, the most common mistake was to call it the capsid, cell membrane or cell wall.

QUESTION 1.3

The most common marking points scored were mp1 and mp2. A number of students mixed up their answers to questions **1.3** and **1.4** and got the difference between structure and location mixed up. Plasmids were not considered as a structure, but just as a type of circular DNA, and so the idea of only bacteria having plasmids was only awarded in question **1.4**. Another common mistake was to confuse the actual structure of the DNA (possibly with viral nucleic acids?) and say that DNA is single-stranded in bacteria and double-stranded in humans.

QUESTION 1.4

Over a third of students were able to score both marks. The most common mark awarded was mp1 and many students appreciated that bacterial DNA is not enclosed in a nucleus, but is in the cytoplasm. Few students mentioned mp3. Some students had confused structure and location, and wrote about chromosomes and histones, which could not be awarded.

QUESTION 1.5

Some students wrote about human cells not being complementary to the antibiotics presumably because they confused antibiotics with antibodies, but most were able to remember that murein is a component of bacterial cell walls, and human cells lack a cell wall.

QUESTION 1.6

Only about 25% of students scored both marks. Students are reminded to practise longer answer questions in order to correctly write out a sequence of events such as breathing out. There were many excellent, detailed accounts but some answers lacked clarity. Many students were able to score mp3, but many could not be awarded mps1 or 2 because they did not give the consequences of the muscle contraction in terms of the rib position or the position of the diaphragm. Stating that the diaphragm was curved was not enough as it could have been curved downwards. No knowledge of the different types of intercostal muscles was needed to get the marks, just the general idea of relaxation, but if internal intercostal muscles were mentioned, it had to be in the context of them contracting. A small number of students unfortunately gave perfect answers, but for inhalation, not exhalation, so could not be awarded any marks.

QUESTION 2.1

A little over one-third of students were able to score 4 marks for this method on one of the required practicals for this paper. There were some accounts that were excellent, but others lacked key points such as using a pencil to draw the origin line near the bottom of the paper, adding the pigments to the origin line, or marking the final position of the solvent. The question asked how the pigments could be separated, and already had the pigments dissolved in solvent. Many wasted time by describing how to get the pigment out of the leaves, or how to use R_f values to determine what the pigments were. The most common mistake was not specifying that the origin line should be near the bottom of the paper.

QUESTION 2.2

Only about 25% of the students were able to score this mark. Although some students appreciated the dangerous/toxic/flammable nature of the solvent, some students gave very vague answers such as the open window allowed the fumes to escape without saying why this was important. Other answers that were *not* awarded any marks included the idea of the pigments drying faster or the solvent diffusing faster, the idea of more light to view the pigments better by or so that they could continue photosynthesising.

QUESTION 2.3

This proved a very challenging question, with only about one in 20 students getting full marks. Common incorrect answers included the 'solvents' having different solubilities or one or more of the pigments being insoluble. Examiners did not award the idea of one pigment being insoluble in solvent **1**, as this pigment would not travel beyond the origin line and so would still appear as a fifth pigment. To be awarded the marks, the answer needed the idea of one pigment having the same solubility as another and so being masked in solvent **1**, but this not being the case in solvent **2**.

QUESTION 2.4

The vast majority of students scored this mark. The only other answer than was seen was for **J**, with the reasoning being that it was 'the first pigment to dissolve'.

QUESTION 2.5

This was well answered in general, with about half the students scoring full marks The most common mistake was to invert the numerator and denominator values when substituting into the R_f calculation.

QUESTION 2.6

This was a straightforward question about the food test for proteins and most students scored both marks.

QUESTION 2.7

The most common marking point awarded was mp4. Common incorrect answers included the low concentration of pigments/proteins or the colour change being unclear. There needed to be a clear idea of the colour of the plant pigment masking the colour of the test result. The idea of not enough protein

was not awarded because it would still produce a purple colour even in low concentrations.

QUESTION 3.1

The definition of quaternary structure was generally well understood. Because of the diagram, examiners also allowed the idea of 4 polypeptide chains, but not any other numbers.

QUESTION 3.2

Most students correctly identified the haem group. Examiners also accepted phonetic spelling. Some just mentioned iron/Fe^{2+}, which was not enough for the mark.

QUESTION 3.3

The majority of students scored the one mark for this question. The calculation should have been straightforward, 141 x 3, possibly with an extra 3 bases for the start and stop codon. Of those that did not, the most common mistake was to divide 141 by 3 instead, and get 47.

QUESTION 3.4

The majority of students scored one mark for 56% as the difference in percentage saturation of haemoglobin, although some did not achieve this mark because they attempted an unnecessary percentage change calculation instead of just finding the difference between the 2 values.

QUESTION 3.5

The full range of answers was seen in this question with some excellent answers gaining all three marking points. Fewer students explained that energy released, or ATP produced, from respiration was needed for muscle contraction. Some students showed a misunderstanding of this topic and claimed that a 'higher' affinity of the haemoglobin for oxygen caused more oxygen to be released to the muscles.

QUESTION 3.6

While students did not always stipulate that carbon dioxide diffuses through the phospholipid bilayer, many did understand that hydrogen carbonate ions needed a channel/carrier protein to pass through the cell membrane. Few achieved mp2 as the idea of it crossing the phospholipid bilayer was required, not just the cell membrane, as the latter would also allow the possibility of it travelling through proteins. In addition, some students could not be awarded mp1 even though they referenced diffusion because they did so in the context of carbon dioxide moving from the alveoli into the red blood cells, which was not the correct context. Some students wrote in detail about

how the carbon dioxide forms hydrogen carbonate ions, something which is not on the specification and would never be asked directly in a question.

QUESTION 3.7

Less than half achieved the 2 marks, but mp3 was sometimes missed due to the absence of a named example of a bond in the answer. Some students just mentioned short-term changes in the affinity due to different environments, or wrote about the selection pressures behind the changes, and could not be awarded any marks.

QUESTION 4.1

Many students were able to achieve mp2 but only about 20 % were able to correctly draw the glycosidic bond pointing upwards and the inversion of the second glucose molecule to gain mp1. Common mistakes were not attempting the glycosidic bond, or drawing it incorrectly i.e. flat or below the molecule as if the glucose were in its alpha form.

QUESTION 4.2

Some excellent answers linked the structure of cellulose to its role in the cell wall of plants. Correct key terms, including microfibrils and hydrogen bonds, were seen in these answers. However, 'parallel strands' was not enough for mp1 as this is not synonymous with being straight. There needed to be the mention of a cell wall for mp4. The idea of cellulose being insoluble or not affecting water potential was not awarded.

QUESTION 4.3

To gain full marks, references to similarities and differences were needed. Only the better students recognised from the diagram the presence of a pentose in hemicellulose which was not present in cellulose. Some students said that there was only one type of monomer in cellulose, but more than one in hemicellulose, as a difference, but this was not enough without any details about the types of monomers present. Answers that only referenced 'contained monosaccharides' were not awarded mp1 because there needed to be the idea of *many* monomers, otherwise they could just have been referring to a disaccharide.

QUESTION 4.4

More than three-quarters scored both marks and were able to identify the biological molecules lipid and starch.

QUESTION 4.5

Around half of students scored mp1. Fewer, although a fair number, realised that hemicellulose contains a pentose sugar, and thus would react with Bial's solution. A surprising number of students wrote about the Benedict's test in their answers, even though this was not one of the tests in table 1.

QUESTION 4.6

This was generally quite badly answered. The most common answer that was given for this question was that not all substances could be detected by the tests in the table. The masking or interfering of colours was also commonly correctly suggested. Many did not achieve mp2 as they did not give details of an example of a biological molecule that was not tested for with the current tests, or they suggested testing for reducing sugars, which was already covered by one of the tests. Mp3 needed the idea of the results of the tests, i.e. the colours produced, interfering with each other.

QUESTION 5.1

Answers for this question ranged dramatically in quality. Like question **04.3**, students are reminded of the need for clear similarities and differences. The prompts on the answer line did help students structure their answers clearly. Few achieved mp3, but most achieved at least one mark. However, a common misconception seemed to be that in phospholipids, the fatty acid tails join directly to the phosphate head, and there is no glycerol. The idea that only fatty acids are hydrophilic/phobic is a property not a structure and so was not awarded.

QUESTION 5.2

Most students were able to score mp2 and discuss the comparison. However, only a small percentage realised it was the starting mass that was different, and reference to the number of fatty acids, with no reference to the sample mass, was not quite enough for the mark.

QUESTION 5.3

A well answered mathematical question. Most students got this mark, with the most common mistake being incorrect rounding of 4.2631579

QUESTION 5.4

A few students lost a mark for not giving their answer to 2 significant figures, otherwise a well answered question.

QUESTION 5.5

Some very good answers were seen to this question. If students scored poorly, it was often their poor expression that let them down. Most students were able to achieve mp1, but only about half also achieved mp2. The most common mistake was either to write about problems with the study, i.e. not being representative, when the question had indicated that only data from the tables should be used, or to get confused and use the fallow deer in the warm regions as an argument against the scientist's statement because there is a higher proportion of unsaturated fatty acids compared to saturated fatty acids in fallow deer. This is not the right answer because the question was asking to compare the proportion of unsaturated fatty acids between deer species, not to compare it with saturated fatty acids.

QUESTION 5.6

Many students scored mp2 and sometimes mp1, but many did not realise that unsaturated fatty acids have a lower melting point than saturated fatty acids and so were more likely to be fluid at lower temperatures. Instead, they hypothesised about unsaturated fats being better insulators or storing more energy than saturated fats.

QUESTION 6.1

If students used the information in the passage as stated, this question proved to be well answered. Many students were able to score some marks with some scoring full marks. Similar morphology was not accepted as an answer for being the same species as this would be more an indication of the same family etc, since the morphology between the cats is still significantly different. References to the recency of the common ancestors was not accepted as this would only matter if it had resulted in differences in the genome. Likewise, references to the genus/binomial name were not accepted as this is a circular argument. Discussion of how much Asian leopard cat DNA is in the Bengal was included by some students, but was irrelevant to the question.

QUESTION 6.2

Only about 20% of students scored this mark. Reference to differences in number of chromosomes was ignored, as this was stated to be identical in the passage. General references to two different species producing infertile offspring were not awarded, as this would also produce infertile female offspring, and did not explain the mechanism behind the infertility. The most common incorrect answer given to this question was that the male hybrids had an odd/incorrect number of chromosomes rather than referring to the inability to pair or ability to produce viable gametes.

QUESTION 6.3

Only about half the students were able to do this calculation. Of the answers that were wrong, there was no clear pattern, although some students did forget one generation, and so gave an answer of 12.5%.

QUESTION 6.4

Many students were able to score at least one mark. However, examiners did not accept the idea of independent segregation as this would not explain why only the Asian leopard cat genes are reduced in percentage. The idea of dilution due to breeding with domestic cats was also not accepted, as this would not lead to production of Bengals.

QUESTION 6.5

Only one in fifty students achieved this mark. Many mentioned the more recent common ancestor idea but few students could be awarded this mark, because the answers needed to show an understanding of the reason why the recency of the common ancestors was important, i.e. there being less time for mutation/changes in DNA to accumulate when common ancestors are recent.