

Examiners' Report November 2012

GCSE Biology 5BI2H 01

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Introduction

Candidates appeared to respond to this paper quite well, as there were very few blank answers. A range of responses were given and all our mark points were seen. The multiple choice questions worked well, but the multiple choice in Q5 was answered incorrectly by a high proportion of the candidates. The questions requiring data analysis caused problems, as did the labelling of the heart diagram. The 6-mark question in Q5 was higher scoring than the one in Q 6; this could be because the content of Q5 had been covered in the June paper.

This report will provide exemplification of candidates' work, together with tips and/or comments, for a selection of questions. The exemplification will come mainly from questions that required more complex responses from candidates.

Question 1 (b)(i)

Many candidates only scored 1 mark for this question, the mark being for a reference to the cell wall. Flagellum was given by many candidates, either forgetting or being unaware that sperm cells possess a flagellum as well. Other responses included ribosomes, but this was deemed to be too vague.

Question 1 (b)(ii)

Most candidates attempted this question and a range of responses were seen. There were some very good, clear responses but there were others where the Science was confused or poorly expressed.

(ii) Describe how the plasmid can be used to genetically modify a bacterial cell to contain a human gene.

(3)

~~The~~ The plasmid is removed from the bacterial cell and enzymes are used to insert a human gene into the plasmid, which ~~is~~ is inserted back into the bacterial cell.



ResultsPlus
examiner comment

This is an example of the standard of response that we were hoping for.

(ii) Describe how the plasmid can be used to genetically modify a bacterial cell to contain a human gene.

(3)

Using a cutting enzyme, a section of the plasmid DNA is removed. A cutting enzyme is used to cut out the human DNA from the DNA strand which is then inserted into the gap in the plasmid DNA with sticking enzymes.



ResultsPlus
examiner comment

This response scored 3 marks, but does illustrate a misconception that we saw frequently. Many candidates seem to think that a section of DNA has to be removed from the plasmid first, before the human gene can be inserted.

Question 1 (b)(iii)

The majority of candidates attempted this question and many scored both marks. There were some candidates who wrote about golden rice and increased vitamin A content.

(iii) Suggest how a named product from genetically modified (GM) bacteria can benefit humans.

(2)

Insulin can benefit humans as those with diabetes have problems in creating insulin in their pancreas.

(Total for Question 1 = 8 marks)



ResultsPlus
examiner comment

The majority of candidates wrote about insulin production for diabetics.

(iii) Suggest how a named product from genetically modified (GM) bacteria can benefit humans.

(2)

Insulin made from (GM) bacteria can benefit humans as those who are vegans can use it as it is not made from animals.

(Total for Question 1 = 8 marks)



ResultsPlus
examiner comment

This illustrates another response that was also acceptable for 2 marks.

(iii) Suggest how a named product from genetically modified (GM) bacteria can benefit humans.

(2)

Golden rice contains the genes from other organism which allows it to make beta carotene, which can help with Vitamin A deficiency as beta carotene is used to make it.

(Total for Question 1 = 8 marks)



ResultsPlus
examiner comment

This is a typical response from candidates who wrote about golden rice and vitamin A production.



ResultsPlus
examiner tip

Candidates should read the question through very carefully, both before and after writing their answer.

Question 2 (a)

This question was relatively straightforward with the majority of candidates doing reasonably well.

DNA

2 A DNA molecule consists of two strands coiled to form a double helix.

(a) Describe how the two strands of a DNA molecule are linked together.

(2)

The two strands are linked together by matching base pairs which are held together by weak hydrogen bonds.



ResultsPlus
examiner comment

This is an example of a good response; it is clear that there is a pairing up of bases and that the bonds are called hydrogen bonds.

DNA

2 A DNA molecule consists of two strands coiled to form a double helix.

(a) Describe how the two strands of a DNA molecule are linked together.

(2)

The Adenine and thymine combines together and guanine and cytosine comes together to form the structure of a DNA.



ResultsPlus
examiner comment

This response scored the second mark as we accepted the named base pairings.

DNA

2 A DNA molecule consists of two strands coiled to form a double helix.

(a) Describe how the two strands of a DNA molecule are linked together.

(2)

They are linked together by nucleotide bases; Thymine, Guanine, Cytosine and Adenine.



ResultsPlus
examiner comment

This response was too vague to be awarded the second mark as there is no indication of actual pairings of the bases.



ResultsPlus
examiner tip

Candidates should always try to be as specific as they can. When writing about DNA they often need to state that the bases have complementary bases to pair with or they have to name which bases pair together.

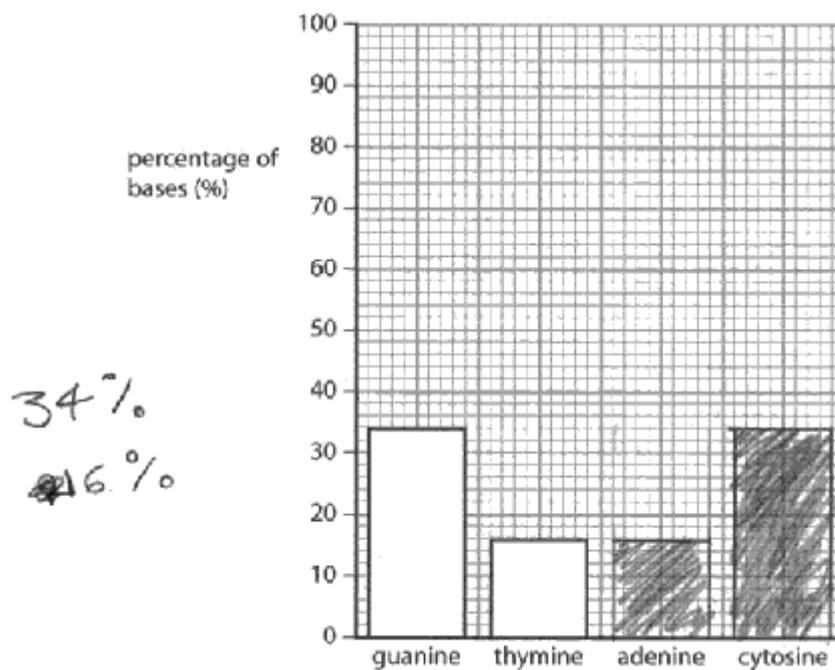
Question 2 (b)

Many candidates scored 1 or 2 marks for this question. Predictably, the commonest mistake was to draw the columns the correct height but in the wrong position.

(b) The bar chart shows the percentage of guanine and thymine in a sample of DNA.

Complete the bar chart to show the percentage of adenine and cytosine in the sample.

(2)



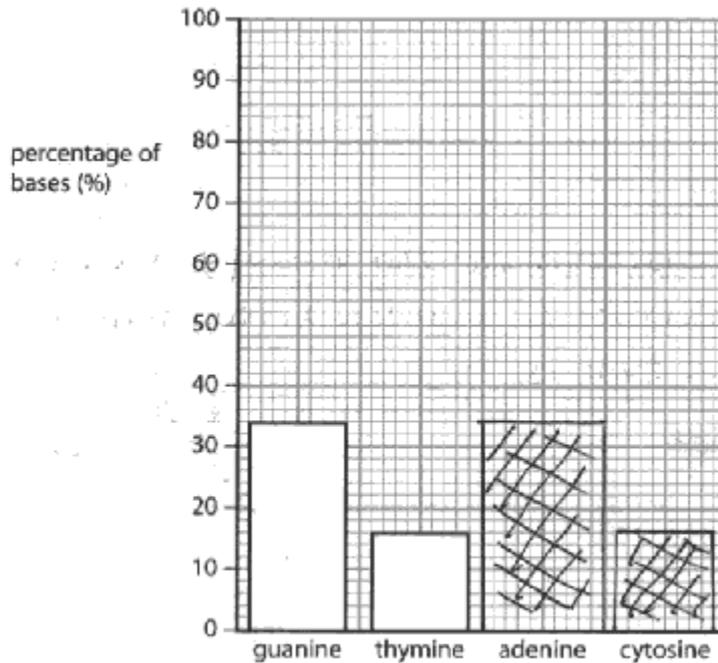
ResultsPlus
examiner comment

This candidate scored both marks, but it was not necessary to waste time shading in the bars.

(b) The bar chart shows the percentage of guanine and thymine in a sample of DNA.

Complete the bar chart to show the percentage of adenine and cytosine in the sample.

(2)



ResultsPlus
examiner comment

This illustrates a response that could only be awarded 1 mark.



ResultsPlus
examiner tip

Learn the base pairings: adenine and thymine, guanine and cytosine.

Question 2(c)(i)

Many candidates completed the mRNA strand correctly. Predictably, some of the candidates gave a T instead of a U for the fifth base. There were some candidates who just copied out the DNA base sequence. Candidates should be schooled to make very clear alterations if necessary; there were some poor alterations made for Cs into Gs and vice versa.

(c) The diagram shows part of one DNA strand.

(i) Complete the empty boxes to show the mRNA strand coded for by this DNA strand.

(2)

DNA strand	G	G	C	T	A	G	T	T	G
mRNA strand	C	C	G	A	T	C	A	A	C



ResultsPlus
examiner comment

A correct sequence except for the T instead of a U.

(c) The diagram shows part of one DNA strand.

(i) Complete the empty boxes to show the mRNA strand coded for by this DNA strand.

(2)

DNA strand	G	G	C	T	A	G	T	T	G
mRNA strand	G	G	C	U	A	U	U	U	G



ResultsPlus
examiner comment

Some candidates knew that there should be a uracil in mRNA but were confused which was the substituted base, as was this candidate.

Question 3 (b)(ii)

This question was poorly answered except by the more able candidates. Many did not quote values for temperature when giving their description and others tried to explain what was happening in terms of the transpiration stream.

(ii) Describe the effect of temperature on water loss from this plant during the investigation.

(2)

We see that from this investigation as the temperature increases the mass increases until 35°C which is the optimum temperature.



ResultsPlus
examiner comment

This candidate has looked at the graph and picked out the appropriate temperature reference but unfortunately has not given their answer in the context of water loss. They were awarded the third mark point.



ResultsPlus
examiner tip

Candidates should read the question very carefully to ensure they are giving the information that the examiner has asked for.

(ii) Describe the effect of temperature on water loss from this plant during the investigation.

(2)

As the temperature increased to its optimum temperature (37°C) the amount of water lost increased, from 15°C - 35°C. Then after this the water loss decreased, this is because there was more water in plant than in air - so less water lost through stomata (transpiration). Whereas before 45°C, more water in plant



ResultsPlus
examiner comment

This was the type of response that we were hoping to get for this question, although the attempt at an explanation was not necessary. This response was awarded 2 marks.



ResultsPlus
examiner tip

The command word **describe** requires candidates to say what is happening. **Explain** is the command word is used when that we want you to use some Science to say why something happens.

(ii) Describe the effect of temperature on water loss from this plant during the investigation.

(2)

The amount of water loss increases up until a certain point, at which, it drops again. This is known as a limiting factor



ResultsPlus
examiner comment

This was very typical of candidates who either forgot or did not realise that values for the independent variable should be quoted in answers for questions of this type. This response was awarded 1 mark.



ResultsPlus
examiner tip

Whenever candidates are asked to describe data, either presented in a table or in a graph, they must quote key values for the independent variable. It is also a good idea to do a very simple calculation for one of the changes they have described.

Question 3 (b)(iii)

We saw all the suggestions listed on our mark scheme but very few candidates gave us two suggestions.

A reference to loss of water from the soil was probably the commonest suggestion made.

(iii) Suggest why the plastic bag was placed around the plant pot during this investigation.

so that none of the moisture⁽²⁾
or water evaporated from the
soil.



ResultsPlus
examiner comment

This question was allocated 2 marks, which indicates that two suggestions are required. This candidate only gave one suggestion so only 1 mark was awarded.



ResultsPlus
examiner tip

Candidates should use the mark allocation as a guide. They need to make as many correct statements as there are marks available.

(iii) Suggest why the plastic bag was placed around the plant pot during this investigation.

so that the water is not absorbed⁽²⁾
again by the soil, and all the water
is collected by the calcium chloride
for a fair test.



ResultsPlus
examiner comment

This candidate did give us two suggestions. We credited the term 'fair test' but would have preferred to have seen the term 'valid' used.

(ii) Suggest why the plastic bag was placed around the plant pot during this investigation.

(2)

So that no water is absorbed by the soil again



ResultsPlus
examiner comment

This was the other common suggestion.



ResultsPlus
examiner tip

Such a simple, single statement is not going to score 2 marks. 2 marks means two facts are required.

Question 3 (c)

Candidates coped quite well with this particular question. Predictably, there was confusion between respiration and photosynthesis but this would not prevent a candidate from being awarded the other 2 marks if given.

(c) Explain how glucose production could be affected if this plant lost a lot of water.

(2)

If there is not enough water then the glucose production ~~decreases~~ ~~need~~ decreases because the process needs water.



ResultsPlus
examiner comment

This was awarded the first mark but was too vague for any other credit.



ResultsPlus
examiner tip

Candidates should always be as specific as they can. If they know the name of the process then they must give it.

(c) Explain how glucose production could be affected if this plant lost a lot of water. (2)

The level of glucose would be reduced as plants form glucose from water and carbon dioxide. So if the levels of water reduces so will the amount of glucose produced.



ResultsPlus
examiner comment

This candidate was awarded the first mark at the end of this response. We were not crediting a reference to a decrease in glucose levels.



ResultsPlus
examiner tip

Another example where the question must be read carefully, so that the response will answer the question.

Question 3 (d)

There were some very good accounts of osmosis, but there was the predictable confusion with active transport.

(d) Describe the process that moves water from the soil into the plant. (2)

There is a high concentration gradient ^{of water} between the root hair cell and the soil. Osmosis is the ~~pass~~ movement of water molecules across a partially permeable membrane from where there is a high concentration of water, to a low concentration. (Total for Question 3 = 10 marks)
of water. So water moves by osmosis in to the root hair cell of the plant.



ResultsPlus
examiner comment

Ignoring the vague first sentence, this is a good example of the type of response we were hoping for. This response was awarded 2 marks.

(d) Describe the process that moves water from the soil into the plant.

(2)

The plant takes water in through tubes in the stem called xylem. The process is called active transport.



ResultsPlus
examiner comment

Weaker candidates wrote about transport of water through the plant or active transport. This response failed to gain any marks.

Question 4 (b)(i)

A reasonable number of candidates could name the enzyme but there was the expected confusion with other enzymes named in the spec.

Question 4 (b)(ii)

A reasonable number of candidates gave amino acids as their response.

Question 4 (b)(iii)

This was a relatively simple calculation that did not present too many problems to candidates.

(iii) Calculate the difference in the rate of the reaction between pH 1 and pH 2.

(2)

12 9
 $12 \div 9 = 1.33$

answer = 1.3 arbitrary units



ResultsPlus
examiner comment

This is an example of where showing working enabled the candidate to score 1 mark (for the correct values read from the graph). Had this candidate just written 1.3 on the line and nothing else, then no marks could have been awarded.



ResultsPlus
examiner tip

Candidates should always show their working. If they get the answer correct with no working then they will get full marks but if their answer is wrong with no working they will get zero.

Question 4 (b)(iv)

This was one of the more challenging questions on the paper and this was reflected in the responses that we saw.

(iv) Suggest why this enzyme works better at pH 1 than at pH 2.

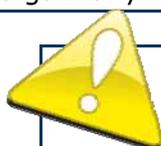
(2)

Because it works in the stomach which is very acidic due to the hydrochloric acid so it needs to be able to work in an acid environment.



ResultsPlus
examiner comment

This is typical of many of the responses that we saw. This response failed to gain any marks.



ResultsPlus
examiner tip

Generally speaking if candidates are asked about enzyme action in the context of temperature or pH, they are probably required to explain the effect that these factors have on the shape of the enzyme and its ability to bind to its substrate.

(iv) Suggest why this enzyme works better at pH 1 than at pH 2.

(2)

At pH 1, the enzyme is not denatured but at pH 2 it surpasses its optimum pH level, and begins to denature. Its active sites are changing and the 'lock and key' mechanism is failing. This means less successful collision, therefore a lower rate of reaction.



ResultsPlus
examiner comment

This is an example of the type of response that we were hoping for. This was a good discriminating question. This response was awarded 2 marks.

(iv) Suggest why this enzyme works better at pH 1 than at pH 2.

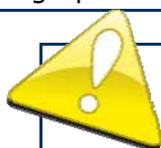
(2)

The enzyme works in the stomach and the stomach has a high pH. The optimum level for the enzyme would be around 1 pH.



ResultsPlus
examiner comment

This response is marginally better as the candidate has tried to use the graph. Very few candidates actually read the optimum pH accurately from the graph. This response failed to gain any marks.



ResultsPlus
examiner tip

When candidates are using information in a graph in their answer, they must read the values exactly and not make approximations.

(iv) Suggest why this enzyme works better at pH 1 than at pH 2.

(2)

closer to
Because it is closer to its optimum pH and it will start to denature after its optimum pH. The shape of the active site will change and the substrate will no longer fit.



ResultsPlus
examiner comment

This is another example of the type of response that we were hoping for in this question.

Question 4 (c)

This question addressed some of the higher level content on the B2 specification. We were impressed with the depth of knowledge that many candidates had on the roles of bile.

(c) Explain the roles of bile in digestion.

Bile emulsifies the fats^{*} so that lipids⁽²⁾ can break ~~it~~ down quicker and more easily into ~~lipids~~ fatty acids and glycerol.

* Increasing the surface area,

(Total for Question 4 = 10 marks)



ResultsPlus
examiner comment

This is a good description of one of the roles of bile. This response was awarded 1 mark.



ResultsPlus
examiner tip

Candidates should read the question very carefully to check that they are answering the question fully. This question asked for the roles of bile and was allocated 2 marks and therefore more than one role needs mentioning.

(c) Explain the roles of bile in digestion.

(2)

bile neutralises the hydrochloric acid from the stomach when the food enters the small intestine as small intestine enzymes don't work well in acidic conditions. It also
* breaks down fats into small drops so there is more surface area for enzymes to act on. (* emulsifies fats)
+ digests the fat.

(Total for Question 4 = 10 marks)



ResultsPlus
examiner comment

A high proportion of candidates did give us the two roles of bile. Although the detailed explanation was not necessary for both marks to be awarded, it was encouraging to see.

(c) Explain the roles of bile in digestion.

(2)

Bile is produced in the liver and is then stored in the Gallbladder. When a fatty food is eaten bile is released so that it can break down large molecules of fat into smaller molecules.

(Total for Question 4 = 10 marks)



ResultsPlus
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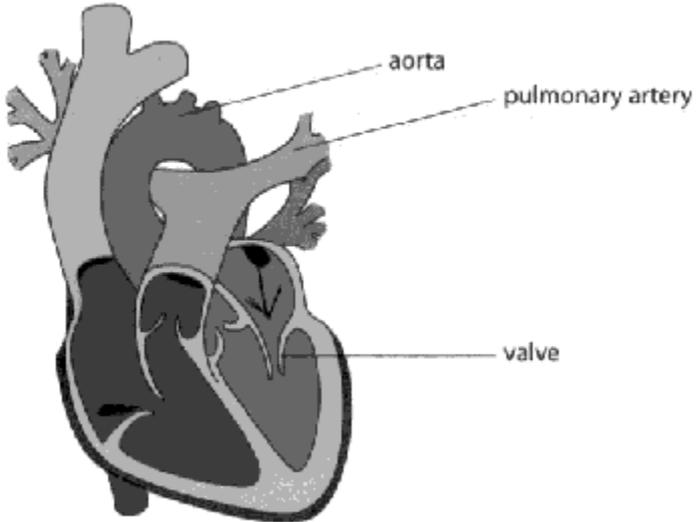
This response illustrates one of the commonest mistakes seen. Unfortunately a reference to molecules of fat being broken down is too wrong for the second mark to be awarded.

Question 5 (a)(i)

Having to draw arrows onto the heart diagram seemed to surprise candidates as just over 50% of candidates got this incorrect. On the scripts there were lots of crossings out where candidates had clearly been uncertain of the answer.

The heart

5 The diagram shows a human heart.



(a) (i) Draw an arrow onto the diagram to show where oxygenated blood enters the heart.

(1)



ResultsPlus
examiner comment

We accepted an arrow pointing into the vessel or, as in this response, an arrow coming out of the aperture.

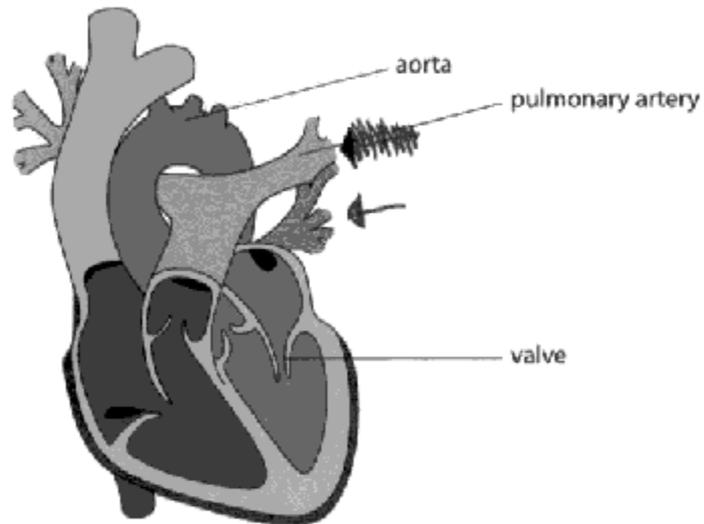


ResultsPlus
examiner tip

If candidates are asked to label a diagram or draw an arrow on it, they must do this carefully and accurately. It must be very clear to the examiner what they are trying to indicate; the examiner will not guess what candidates mean.

The heart

5 The diagram shows a human heart.



(a) (i) Draw an arrow onto the diagram to show where oxygenated blood enters the heart.

(1)



ResultsPlus
examiner comment

This is another example of a correct response.

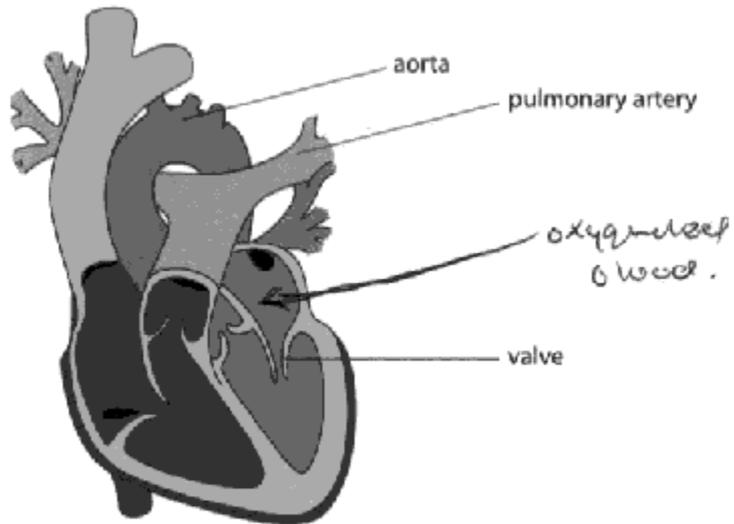


ResultsPlus
examiner tip

This candidate has clearly changed their mind and made a very clear crossing out. Remember that any alteration must be clear; it is better to cross out a mistake and rewrite an answer than to try and alter the original answer.

The heart

5 The diagram shows a human heart.



(a) (i) Draw an arrow onto the diagram to show where oxygenated blood enters the heart.

(1)



ResultsPlus examiner comment

Although the candidate has indicated correctly which chamber the blood is entering, this does not actually answer the question. This response failed to gain any marks.



ResultsPlus examiner tip

Always read the question carefully and make sure labelling etc of diagrams is clear and accurate.

Question 5 (a)(ii)

Many candidates only gave one statement about the blood in the pulmonary artery. There was a lot of confusion between the pulmonary artery and the aorta and where blood was being carried to and from.

(ii) Suggest how the blood flowing through the pulmonary artery would be different from the blood flowing through the aorta.

(2)

Blood flowing through the pulmonary artery would be deoxygenated and would be pushed through at a lower pressure than the blood leaving through the aorta. Blood flowing through the aorta would be oxygenated and would be supplied to the whole body, whereas blood from the pulmonary artery would only travel to the lungs.



ResultsPlus
examiner comment

This is an example of the type of response that we were hoping for. This response was awarded 2 marks.

(ii) Suggest how the blood flowing through the pulmonary artery would be different from the blood flowing through the aorta.

(2)

Blood flowing through the pulmonary artery would be oxygenated being sent around the body whereas blood flowing through the aorta would be de-oxygenated.



ResultsPlus
examiner comment

Unfortunately this type of confusion was seen from a high proportion of candidates. This response failed to gain any marks.

Question 5 (a)(iii)

A large proportion of candidates could tell us that the valves were to prevent backflow, but only the better ones extended their answer to include our second mark point.

(iii) Describe the role of the valve labelled on the diagram.

(2)

The valves are there to prevent back flow of the blood in the heart and to make sure they go the right way.



ResultsPlus
examiner comment

This response was typical of the responses that we saw. This response was awarded 1 mark.



ResultsPlus
examiner tip

If there are 2 marks available, candidates must give two pieces of information.

Question 5 (b)(ii)

Candidates made a really good attempt at this question. Some took their answer too far and went into details about the oxygen debt and ultimate removal of the lactic acid. This did not count against them, we just ignored it.

*(ii) A reduced cardiac output would affect the performance of an athlete.

Explain the effects that a reduced cardiac output would have on the muscle cells of an athlete.

Reduced cardiac output would mean less oxygen will be pumped to the body muscle cells and less CO_2 will be removed. This means that the athlete will ~~not~~ start respiring anaerobically as there is not enough oxygen and glucose being pumped to the muscle cells. Anaerobic respiration converts glucose to lactic acid creating energy. If cardiac output is reduced, then the oxygen cannot convert the lactic acid to CO_2 and water. Lactic acid build up can cause cramps and muscle pains in the muscle cells meaning the athlete will become tired and performance will decrease and deteriorate. Reduced cardiac output is due to reduced stroke volume or heart rate.

(Total for Question 5 = 12 marks)

~~less O_2~~

• (e3) O_2 , cramps + pains, lactic acid, anaerobic, tired



ResultsPlus
examiner comment

This is a good example of the high standard of response that we saw from some candidates. It is clear and concise, gives us several relevant facts with good spelling, punctuation and grammar.



ResultsPlus
examiner tip

This candidate has underlined the question command word and the key terms in the question. This may help candidates to identify what the question wants them to write about.

*(ii) A reduced cardiac output would affect the performance of an athlete.

Explain the effects that a reduced cardiac output would have on the muscle cells of an athlete.

(6)
A reduced cardiac output would allow less oxygen to get to the muscle cells of an athlete, as it is oxygenated red blood cells which carries the oxygen. If their ~~muscles~~ muscles aren't getting as much oxygen, then they'll have to resort to anaerobic respiration, which will cause a buildup of lactic acid in their muscle cells, which will cause the athlete to perform badly, as the lactic acid will cause the athlete to tire and fatigue much more quickly.

(Total for Question 5 = 12 marks)



ResultsPlus
examiner comment

This is a very good level two response; there is not quite the content in this response as there was in the previous one. The response is clear and the spelling is good.

* (ii) A reduced cardiac output would affect the performance of an athlete.

Explain the effects that a reduced cardiac output would have on the muscle cells of an athlete.

(6)

If an athlete went from having a good cardiac output where blood quickly got to his muscles whilst he exercised ~~and~~ he would perform well. However, if the athlete ~~has~~ ^{now has} a reduced cardiac output this would significantly ~~s~~ affect his performance and as he exercised if he exercised at the same rate he did before his cardiac output ~~was~~ ^{was} ~~low~~ ^{low} then he could cause serious damage to his muscles as not enough oxygenated blood would get to them in time causing ~~possible~~ injury and largely affecting muscle cells

(Total for Question 5 = 12 marks)



ResultsPlus
examiner comment

This candidate has tried to answer the question, but has not included many GCSE level facts. Although there is not much information, it is still clear and unambiguous with good spelling. A level 1 response.



ResultsPlus
examiner tip

Try not to get carried away with what you write, thinking that a question is easy. You must include Biology that you have learnt during the course.

Question 6 (a)

There were some good responses seen, although the points had to be picked out from extensive descriptions of the process of meiosis. The expected confusion with mitosis was seen. Some candidates forgot to name the process before going on to give us the required information.

Reproduction

6 (a) Sperm cells and egg cells are needed for human sexual reproduction.
Describe in detail the type of cell division that produces sperm cells. (4)

The cell division that produces sperm cells is meiosis. Meiosis begins with cell division after ~~splitting~~ the chromosomes in the diploid cell copy themselves. The cell then splits into 2, and then 2 again, producing 4 ^{genetically} unidentical haploid ~~daughter~~ gametes.



ResultsPlus
examiner comment

This is an example of a response that scored all 4 marks.



ResultsPlus
examiner tip

Whenever describing the cells produced as a result of either mitosis or meiosis, always use the word **genetically** – do not simply say identical or non-identical.

of appropriate number of chromosomes.

Reproduction

6 (a) Sperm cells and egg cells are needed for human sexual reproduction.

Describe in detail the type of cell division that produces sperm cells.

(4)

Sexual reproduction is ~~not~~ a cell division called meiosis, meiosis produces 4 diploid genetically identical daughter cells by starting with a haploid cell replicating/copying the DNA, it ^{so it has the} * then divides into 2 cells and each cell divides immediately again forming the 4 diploid cells.



ResultsPlus
examiner comment

We mark positively. Although there are mistakes in this response, this candidate clearly knows the name of the division and how many cells are produced so can be awarded 2 marks. There are no ambiguities.

Question 6 (b)

This 6-mark question did cause more problems than the previous one. This was not surprising as the question content is more challenging and this topic was not addressed to any extent in the June paper. The candidates were required to talk about all three processes (fertilisation, division and differentiation) to be at a level 3, any two processes for a level 2 and just one process for a level 1.

Using the diagram and your own knowledge, describe the processes that take place in the formation of the fetus from a sperm cell and an egg cell.

(6)

A sperm and egg cell are both haploid cells - they contain half the amount of ~~the~~ chromosomes of a diploid somatic cell. During fertilisation, the sperm and egg cell fuse together combining the nuclei to become a diploid cell known as a zygote. (Two sets of half the number of chromosomes make a full set of chromosomes). Once the zygote is formed, cell division in the form of mitosis (making genetically identical daughter cells) is stimulated so the zygote continues to divide making an embryo - a ball of cells. Division continues to happen in the embryo so that continues to grow. Embryonic stem cells are stem cells in the embryo that can differentiate or specialise to become cells with a specific purpose - during the embryonic stage - these stem cells differentiate into specialised cells required - neurones, bone tissue and muscle cells etc. They can differentiate into almost any type of cell in the body. Cells continue to divide and differentiate forming complex cell structures and organs as required. When cells begin to differentiate a fetus is formed.



ResultsPlus
examiner comment

A good response addressing all three processes, so level 3. The response is clear and the spelling is good.



ResultsPlus
examiner tip

To access full marks candidates must answer all aspects of a question.

Using the diagram and your own knowledge, describe the processes that take place in the formation of the fetus from a sperm cell and an egg cell.

(6)

As one sperm cell penetrates the egg, the nuclei break open and fuse together. This creates one diploid nucleus from two haploid nuclei. The egg cell is stimulated by the sperm to ^{begin to} grow. The cell is now called a zygote. The zygote implants into the wall of the womb and begins to multiply ~~big~~ through the process of mitosis. It is genetically different from both parents. Mitosis divides once, forming two daughter cells which are identical to the first. As the zygote divides it becomes an embryo. Once the embryo ~~looks~~ recognisably human (or whichever animal's reproduction I am describing), it is called a fetus. It is connected to the mother via a placenta and floats in a gel-like substance which helps to protect it. The walls of the womb also serve a protective ~~from~~ purpose to the fetus.



ResultsPlus
examiner comment

This candidate has given us relevant information about fertilisation and division, so this is a level 2 response.

Question 6 (c)

Few candidates have learnt that in a question where the command word is **compare**, pairs of comparative points must be given. Many candidates wrote everything that they knew without ensuring that there were matching points.

(c) State **two** differences between sexual reproduction and asexual reproduction.

(2)

Asexual only has one parent whereas sexual reproduction has two. In Asexual reproduction the organism is genetically identical to its one parent, whereas in sexual reproduction the organism is not genetically identical to either parent.

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS



ResultsPlus
examiner comment

An example of a nice clear response. This response was awarded 2 marks.

(c) State **two** differences between sexual reproduction and asexual reproduction.

of opposite genders (2)

Sexual reproduction requires 2 partners, however asexual reproduction requires only 1 of the species.

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS



ResultsPlus
examiner comment

A clear comparison of just one aspect. This response was awarded 1 mark.



ResultsPlus
examiner tip

Comparisons require pairs of matched points for a mark. If there are 2 marks available then two comparisons must be made.

(c) State **two** differences between sexual reproduction and asexual reproduction.

(2)

Asexual reproduction is done by mitosis, where the organisms are genetically identical to each other, used for growth cell repair. Sexually requires two organisms ^{So} and requires games and produces an offspring that is not genetically identical to parents.

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS



ResultsPlus
examiner comment

This candidate has tried to make a comment about gametes (our second mark point) but has not told us that they are not needed in asexual reproduction. This response was awarded 1 mark.



ResultsPlus
examiner tip

Candidates must be very clear in their responses and say exactly what they mean. Examiners will not make assumptions from what they have not said.

Paper Summary

This paper discriminated well across the higher tier ability range and many candidates were familiar with the content of the higher level specification points.

Based on how candidates performed on this paper, candidates should:

- practise describing data from graphs
- practise identifying the question command words
- learn more about meiosis and mitosis, DNA, RNA and protein structure and the flow of blood through the different blood vessel types.

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