



Examiners' Report November 2012

GCSE Biology 5BI1H 01



ALWAYS LEARNING

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at <u>www.edexcel.com</u> or <u>www.btec.co.uk</u> for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at <u>www.edexcel.com/contactus</u>.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.

Their contact details can be found on this link: <u>www.edexcel.com/teachingservices</u>.

You can also use our online Ask the Expert service at <u>www.edexcel.com/ask</u>. You will need an Edexcel username and password to access this service. See the ResultsPlus section below on how to get these details if you don't have them already.



Using mock and exam data to improve teaching and learning

ResultsPlus is Edexcel's free online service giving instant and detailed analysis of your students' exam and mock performance, helping you to help them more effectively.

- See your students' scores for every exam question
- Spot topics, skills and types of question where they need to improve their learning
- Understand how your students' performance compares with Edexcel national averages
- Track progress against target grades and focus revision more effectively with NEW Mock Analysis

For more information on ResultsPlus, or to log in, visit <u>www.edexcel.com/resultsplus</u>.

Your exams officer will be able to set up your ResultsPlus account using Edexcel Online. Alternatively, call us using the details on our contact us page at <u>www.edexcel.com/contactus</u>.

Pearson: helping people progress, everywhere

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 raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk.

November 2012

Publications Code UG034037

All the material in this publication is copyright © Pearson Education Limited 2012

Introduction

This assessment is the fourth examination for B1 from the new specification and follows the same format as the other examinations. There is a series of six questions where the demand is increased within the question and throughout the paper. The first parts of each question should be accessed by all candidates. There are two 6-mark questions on the paper, which are designed to be accessed by all candidates at some level. The 6-mark questions are marked using a generic marking grid and spelling, grammar and clarity of writing are taken into account in these questions.

In this paper we are looking for a candidate's understanding of the Biology and also their ability to apply that knowledge to a number of different situations.

Candidates answering Q1 had a good understanding of the process of evolution and speciation, although many lost marks because they did not directly answer the question. It was pleasing to note that many candidates are now aware of how scientists validate their work with the use of journals and peer review.

Q2 was based on the nitrogen cycle and the effects of the overuse of fertilisers. Candidates had a good grasp of this subject and, in particular, of the process of eutrophication. Less well understood were the roles of soil bacteria in the nitrogen cycle, with many candidates confusing the different soil bacteria. A tip here is to make sure that the candidates are focusing on the question asked; this was very specific in asking about soil bacteria providing nitrates for the plants.

Q3 showed evidence of some good mathematical skills in calculating percentages and many candidates are now showing their working, which can gain them credit even if the answer calculated is incorrect. A good knowledge of the effect of alcohol on the body was shown, although several candidates did not pick up on the fact that we were looking for the long-term effects. The discussion question on organ transplants for alcoholics provoked some interesting responses. It is useful to note that, when discussing ethics, both sides of the argument should be expressed for full marks.

Q4 discriminated well between the grades, with more able candidates giving a full description of thermoregulation, while less able candidates gained some credit for their knowledge of the mechanism of sweating or the role of body hair in thermoregulation.

Q5 was very well answered, with many candidates comfortable with the genetics topic and confident in producing Punnett squares and percentage probabilities. Where this could be improved is by ensuring that they can explain these outcomes effectively, using the common genetic terms correctly. Candidates lost marks on the symptoms of cystic fibrosis; again this was due to not focusing on the question asked. This question was specific in asking about the reasons for weight loss in CF sufferers but many candidates focused on mucus in the lungs, which did not answer the question.

Q6 related to the roles of nerves and hormones in the human body. The treatments for diabetes were very well understood, with a large proportion of candidates gaining full marks for this question. For the reflex arc, most candidates were able to access this at some level and many were able to give a full description of the reflex arc, including the roles of synapses and the myelin sheath, which was commendable.

Emphasis should be focused on the fact that all questions should be accessible to all candidates at some level and so candidates should be encouraged to read and respond to the whole paper. Calculations should always have the working shown as credit can be gained for the working if it is correct. Finally, candidates may find it helpful to underline key words in the question to focus their thoughts on the actual question being asked rather than a broad outline of a topic.

Question 1(a)(ii)

This question needed the candidate to relate a seen structure of the Pompeii worm to its ability to survive in extreme heat. The question was of a 'suggest' type so candidates were not expected to have studied Pompeii worms in detail but to have some knowledge of extreme environments, such as hydrothermal vents.

Candidates lost marks on this question by not being specific about the structures they could see and the adaptations that enable the worm to live in the hydrothermal vent. Although knowledge of the Pompeii worm was not expected, how an adaptation might benefit it was.

heat.	(1)
Beirg small in size.	
ResultsPlus	
examiner comment	
Note the candidate does not make reference to how this adapta could benefit the Pompeii worm in extreme heat so no marks w	
awarded.	
Suggest a feature that helps to protect the Pompeii worm from the extre heat.	me
Auck.	(1)
il the second seco	
its tott outer layer of Asim and the	
its tott outer layer offision and the Strands Onet come off of it.	
its sett outer layer of Asian and the Strands onet come off of it.	
its sett outer layer offision and the Strands that come off of it.	
its tott outer layer offision and the Strands onet come off of it.	
its sett outer layer of tsin and the Strands onet come off of it. ResultsPlus examiner comment	
its tott outer layer offision and the Strands onet come off of it. ResultsPlus	s they

					(1)
h	0 24	es an	d they	use	
- 1 -	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	r	÷.		
Cher	vosynt	hesis.		*****	

ResultsPlus examiner comment

Although the candidate has managed to state some functions of the Pompeii worm, this is not what the question is asking. In this case, although it is good knowledge that the Pompeii worm uses chemosynthesis to gain nutrients, this does not explain an adaptation to extreme temperatures as asked for in the question.



Ensure the candidate reads the question and highlights the appropriate information to ensure they remain focused on the question that is asked, and are not tempted to put down all they know about a subject without answering the question.

Question 1(a)(iii)

This question is testing the 'How Science works' section of the qualification but it also directly relates to a specification statement and therefore should be required teaching. Candidates were split on this question between those who gained the marks readily and those who went off on a classification tangent. The responses below illustrate this point.

(iii) Pompeii worms were discovered by French marine biologists in the early	1980s.
Explain how these biologists may have validated the evidence for the discovery of the Pompeii worms.	
	(2)
The evidence could be valualated by other scientisks readily	ng frieir work
and repeating the experiments from scientific journals, by peer	-reviewing
the work to check it was done to the highest standard, an	na ph
discussing and shafing new evidence at scientific confere	<u>NC05</u>
N	



This candidate has accessed both marks successfully. They have referred to both the use of scientific journals to publish findings and the peer review process, which has earned them the marks. Marks could also be awarded for mentioning scientific conferences or even sending other scientists to corroborate the claims.

(iii) Pompeii worms were discovered by French marine biologists in the early 1980s. Explain how these biologists may have validated the evidence for the discovery of the Pompeli worms. Obec Kno would of validated this by f a hybrid once there ibility find a class and what 19ht bein.



This candidate, like many, got side-tracked onto the classification of an organism as a way of validating the evidence. This is not what the question was asking; the classification of an organism would not validate the discovery. As a result this candidate did not gain any marks on this question.



Ensure when answering any question that the candidate responds to the actual question asked and does not rely upon the overall flow of the whole question to dictate their response.

Question 1(b)(i)

Many candidates gave responses that showed understanding of the process of evolution but did not actually answer the question being asked.

(b) Variation in a population enables evolution to occur. (i) Explain, using Darwin's theory of evolution, how variation can lead to a species evolving. (2)vañañon "ie diterences in a species, this can orophism adapt in different ways make genes on to their offspring, over time and will evolve. Speciel



Darwin's theory of evolution is outlined in detail in the specification and therefore candidates need to be able to relate this theory to a given question. This candidate has explained evolution in terms of the organism passing on genes to their offspring but it does not answer the whole question so only 1 mark can be awarded.



Candidates need to ensure that they read the whole question and do not just focus on the first few words.

(b) Variation	n in a population enables evolution to	occur.	
	ain, using Darwin's theory of evolutio ties evolving.	n, how variation can lead	to a
Becom	use everyone has a	different Charo	(2) Inchemistics, Species
adapt	to their environment,		



This candidate has given a vague response and so has not gained any of the marks available. The candidate also implies that the organism adapts to the environment; this is untrue – the organism may have characteristics that make it better adapted or less well adapted to an environment but it does not change its characteristics to the change in environment.

Question 1(b)(ii)

The candidates who understood speciation answered this question well but many candidates still believe that this formation of a new species occurs spontaneously when an organism changes its environment. Candidates who extended this type of answer gained no marks for the idea.

(ii) Evolution can lead to speciation. Describe what is meant by the term speciation. (2)specification is where a creature or has a specific fearure that can adapt to their environment (Total for Question 1 = 8 marks) examiner comment This candidate has implied that the animal can adapt to the environment they are in. This is untrue; animals have characteristics that make them more likely to survive in an environment but they do not grow extra legs because they are needed. No marks were awarded for this response. (ii) Evolution can lead to speciation. Describe what is meant by the term speciation. (2)Speciation occurs when a species becomes isolated (prographically) and develop enoteristics to help them survive in their corresponding environment. environmental conditions and chimades the species adap and show appending will be so different that they would not be to interpreed. able (Total for Question 1 = 8 marks) examiner comment This candidate was aware that geographical isolation can lead to speciation and gained 1 mark for this. They also gained 1 mark for recognising that the organisms that develop into a new species are no longer able to breed with the original species. They did not get credited for 'develop advantageous characteristics' as this implies that this

happened on entering the environment. We do not penalise candidates

so the candidate still gained the 2 marks for the question.

10

Question 2(a)(ii)

Candidates were generally very clear about how eutrophication occurs, although several did try to include the result of eutrophication, starting with the algal bloom and continuing. This was not credited with marks but it did not negate any marking points. Candidates do need to focus on the main thrust of the question and not get side-tracked into spending a lot of time answering the question they would like to have been asked.

(ii) Suggest how farming can lead to a build-up of nutrients in the lake. (2)Farming using too much fertiliser, which rivers can increase the build-up nutrience in the lake. examiner comment This answer gave the response required for both marking points. The overuse of fertiliser resulting in this washing into the water courses was credited. (ii) Suggest how farming can lead to a build-up of nutrients in the lake. (2) Formers use wood killers, which are often washed up by rain and men camed aut to a Lake / river esuiting a build up of numerits. xaminer comment The candidate gained the second mark here for the substances being washed into rivers etc but could not be given a mark for nutrients as this was in the stem of the question. We were looking specifically for the overuse of fertilisers or named fertilisers for the mark.

Question 2(a)(iii)

Overall, candidates were able to recognise that plants grew more if they were provided with nitrates. There were a few instances where candidates referred to plants growing; this was not credited with the mark as plants grow anyway. A comparative was needed here to gain the mark. A mark was also given for the fact that plants make proteins for growth.

(iii) State the effects of nitrates on plant growth. (1)eto linna examiner comment The question specifically asked for the effect of nitrates on plant growth, which was that it was increased. We did allow this answer for a marking point as the candidate showed good biological knowledge that plants use nitrates to make proteins, which increases plant growth. (iii) State the effects of nitrates on plant growth. (1)grow as well / healthy examiner comment Some candidates related nitrates to a reduction in plant growth but, while we accept that the **overuse** of nitrates can cause problems with plant growth, this was not the question asked so no marks were awarded here.

Question 2(b)(i)

Candidates accessed this question well with the majority gaining 1 or 2 marks. The naming of the bacteria was clear but sometimes the action of these bacteria was misunderstood. The mark scheme requires the linking of the marking points so a candidate could only gain subsequent marks if they were linked with the information they had previously given.

(b) (i) Nitrates can be produced by soil bacteria.	
Explain how soil bacteria produce nitrates.	(3)
the God hadarin and a silviber than the air	grafiyiyaana
the brown it down until nitrates are lest	89 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
the plants then take nitrates in for them t	0
gíow.	
น สุนแกร้แล้วการแกรงการประกอบการที่สังการและสายกำลังการและและและสายสังวิทยาสายได้เสียงสายสายและสายการและสายการแ	



This candidate has misunderstood the nitrogen cycle and, in particular, the role of soil bacteria in producing nitrates for the plant. Please note that the question was specific in asking about soil bacteria in the production of nitrates. If a candidate mentioned denitrifying bacteria or lightning, they were not credited, although, equally, they were not penalised if they did include this information.

1.0.1
(b) (i) Nitrates can be produced by soil bacteria.
Explain how soll bacteria produce nitrates.
(3)
Ninegen fixing balleria turs almospheric nitrogen into nitratas
in the soil. Nitribuing backria tune ammonia into
nituter. Ammonia came prom when decomposer backria
burned decomposition of uses and doesd and plant animals with backsing.
amouthing alminument office the control of the cont



Question 2(b)(ii)

Candidates often confused denitrifying and nitrifying bacteria and their roles. Nitrate fixing bacteria was also a common, incorrect response.

(ii) Name one type of bacteria that reduce the nitrate content of soil? and then Back is 11) the a NOVOR (Total for Question 2 = 8 marks) examiner comment This is an incorrect response; the candidate has confused denitrifying bacteria and nitrogen fixing bacteria.

Question 3(a)(ii)

Candidates had to recognise that height was a continuous variable; continuous data was acceptable. Some candidates tried to describe the graph and others confused continuous with discontinuous.

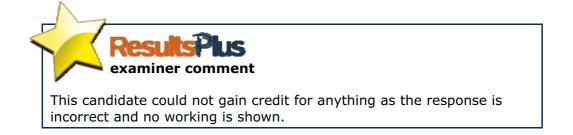
(ii) State the type of variation, shown in the graph, that results in a normal distribution curve. (1)Continuos examiner comment Correct answer for 1 mark. (ii) State the type of variation, shown in the graph, that results in a normal distribution curve. (1)convination discontinuous. examiner comment This candidate has confused continuous data and discontinuous. Height is continuous because it varies over a range. Something like eye colour

or blood group would be discontinuous.

Question 3(a)(iii)

This was a very simple percentage calculation, which was generally completed well. Please ensure that all working is shown, as a mark can be awarded for the correct procedure even with the incorrect outcome.

(iii) Calculate the percentag	ge of people with a body to $18 \div 3 = 6$	emperature of 37.5 °C. 1 (2) 18 people.	
-3,XS	6x5=30		
- ,		answer =	
 A			
shown the working; th	se for 2 marks. Please nis means that even i	e note that the candidate ha f the calculation had not ill have gained one of the 2	IS
(iii) Calculate the percentag	e of people with a body te	mperature of 37.5 °C. (2)	
		answer = 🕌 [] %	



Question 3(b)(i)

There was an even spread of marks for this question with a fairly large proportion of candidates gaining all 4 marks. Candidates need to be specific about heat loss and not just make vague references to thermoregulation for the marks.

(b) A person with a body temperature of 37.9 °C had a body temperature of 37.5 °C one hour later. (i) Explain how thermoregulation causes this reduction in body temperature. (4)it is possible they have SU reated in that time, causing evapora which cools star you Down . . . examiner comment This candidate scored 2 marks. They recognised that the body produces sweat and identified the method of heat loss, which is the evaporation of the sweat from the surface of the skin. examiner tip Try to look at the marks awarded for the question and in the case of general questions, such as this one, remember that the marks are

awarded on a point by point basis so here 4 points on cooling the body

down are required for 4 marks.

(b) A person with a body temperature of 37.9 °C had a body temperature of 37.5 °C one hour later.

(i) Explain how thermoregulation causes this reduction in body temperature.

(4)Secrete The bodys sweat glands produce sweat, the sweat then evaporates on the surface ont the skin which cooks down the skin. The blood wessels neaver to the skins Surface carries more blood through them, allowing the heart from my blood to leave the body through the skin which malees the stein horn, the stein is coored dan by sneat, the hours on the body remain nut-. . . examiner comment This is an excellent, detailed response. This candidate gained all 4 marks. (b) A person with a body temperature of 37.9 °C had a body temperature of 37.5 °C one hour later. (i) Explain how thermoregulation causes this reduction in body temperature. (4)Thermogulation causes recluction in the bady temperature because when the body gets to hot something is released Ele 6000 alls. examiner comment This candidate failed to gain any credit as the references are vague and no mechanism of heat loss is explained.

Question 3(b)(ii)

For this question, candidates had to apply their knowledge of thermoregulation in relation to body temperature rise. Several candidates continued talking about how to reduce temperature, which did not gain any marks.

(ii) Explain how exercise can cause body temperature to increase. (2)When a person exercises they more around more so the heart starts pumping blood around the body quicker and the heart voite increases. (Total for Question 3 = 10 marks) examiner comment Several candidates referred to the increased movement of blood but we were asking for muscle movement leading to heat being released by respiration. No marks were awarded for increased blood flow as this was not qualified by how this raises body temperature. (ii) Explain how exercise can cause body temperature to increase. (2)Friction can take place. e musicles work herder which body temperature to (Total for Question 3 = 10 marks) examiner comment This candidate gained both marks as they mentioned the muscles moving and related this to friction converting chemical energy to heat.

Question 4(a)(ii)

Candidates often lost marks here due to the fact that they did not give the range of time when the defect was likely to occur from the data in the table.

Question 4(b)(i)

Marking points 1 and 2 were most often awarded for the 'chemical' substance that 'had an effect on the body'. The majority of candidates achieved one mark here.

(b) (i) Alcohol is a drug.
Define the term drug . (2)
A drug is a chemical of substance that changes the way the body, work of the how the brain twinks.
ResultsPlus examiner comment This is a clear response, which addressed the first two marking points. A good answer.
(b) (i) Alcohol is a drug. Define the term drug. (2) a drug is a liquid or a Solid Huit Seriarly hurts your boody by Surchars Which can gained brides problems
ResultsPus examiner comment This candidate did not give a definition of the term 'drug' but went along the way of giving only adverse effects of drugs and therefore was not credited with a mark.

Question 4(b)(ii)

Several candidates referred to the general effects of a depressant – making you sad – rather than the effects of depressants on the nervous system. Candidates often confused an increase in reaction times and a decrease in reaction times, causing them to lose marks, as they stated that alcohol decreases reaction times rather than increases. The better candidates were able to relate this to the action of alcohol on the neurotransmitters at the synapse.

Question 4(c)(i)

This question was answered very well, with many candidates aware of cirrhosis of the liver, albeit with many different spellings of 'cirrhosis'. Those who were unable to come up with cirrhosis were still able to gain a mark for liver damage or brain damage.

(c) (i) Describe a long-term effect of alcohol abuse. (2)Long term effect of alcohol ouse could be deep liner damage is because alcohol Stop D 60 m Working examiner comment This is fine for 1 mark. To gain the second mark the candidate would have had to link this to a specific disease eg cirrhosis. (c) (i) Describe a long-term effect of alcohol abuse. (2)damase to the organs, early poorly or even examiner comment This candidate has not been specific enough in the response. The question asked for a description of a long-term effect and this answer is too vague.

Question 4(c)(ii)

Ethics questions often elicit many different responses and, because of this, it is difficult to provide a tight mark scheme but candidates needed to have the idea of alcoholics causing their own liver failure and thus they may continue to damage a new organ if they have one implanted. They could also have gone down the route that alcoholism is a disease and therefore the alcoholic is a victim and should be entitled to the transplant. In a discussion-style question, the candidate should give both sides of the argument.

(ii) Discuss the ethics of allowing alcoholics to have an organ transplant. (2) people should have the right to new but if the reason for needing the lant was their own fault eg smoking a the Some people would again. do it (Total for Question 4 = 10 marks) examiner comment In this case, the candidate gave both sides of the argument, with everyone having a right to life but also noting that the organ failure was self-inflicted. 2 marks were awarded here.

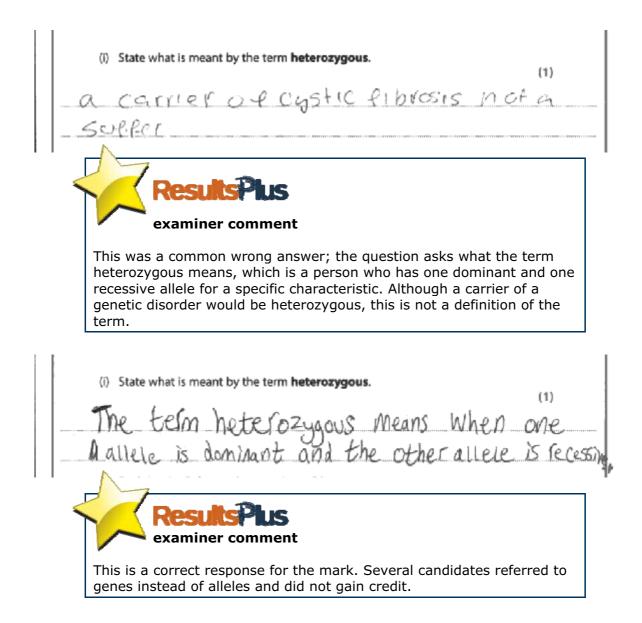
Question 5(a)(ii)

Many candidates saw the term cystic fibrosis and went on to describe the build-up of mucus in the lungs without reading the next, and most important, part of the question. Several candidates mentioned malnutrition as a symptom but did not describe how the malnutrition came about. Those candidates who did well usually mentioned the fact that enzymes were not able to be released from the pancreas and therefore the digestion of food was reduced.

(ii) Explain why a person with cystic fibrosis (CF) may lose body mass.
The Because there is a lot of thick
mucus blocking the air passages meaning that oxingen contract seenter the block in as much
oxugen contract the block in as much
quantibles. This means your body will lose gome wreght.
examiner comment
This was a common mistake made by candidates but the question specifically asks about a loss in body mass. In this case we wanted the information that cystic fibrosis does not only affect the lungs but also the digestive system, blocking the release of enzymes from the pancreas and causing reduced digestion and absorption.
(ii) Explain why a person with cystic fibrosis (CF) may lose body mass. (2)
A person with Kystor Rybrosos work be able toget
all the nutrients they need because mucus feits up the
alugestive system which means the the in the
threather won't get be able to absorbe the nutraones from the food.
ResultsPlus examiner comment
This candidate recognised the fact that mucus blocks the digestive system, reducing the amount of absorption through the intestine wall; 2 marks were awarded.

Question 5(b)(i)

Candidates are now able to describe this term effectively: there were more references to alleles than to genes, which is creditable. Several candidates referred to carriers being heterozygous; they are, but this is not a definition of the term.

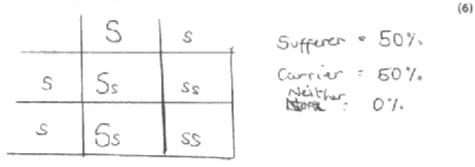


Question 5(c)

Overall this question was answered well, with most candidates able to draw a correct Punnett square or genetic diagram. Frequently the description of the inheritance was less well answered and this put candidates into band 2 with a maximum of 4 marks. The question also asked for percentage outcomes, which were generally calculated correctly and explained. Common mistakes were references to genes instead of alleles, a mix-up with homozygous and heterozygous and, in some cases, candidates using letters for alleles that could not be interpreted as lower- or upper-case letters. *(c) Sickle cell disease is another genetic disorder caused by a recessive allele (d).

Explain the inheritance of sickle cell disease in a family with a heterozygous father and a homozygous recessive mother.

You should use a genetic diagram or Punnett square and percentage outcomes in addition to your explanation.



If the mother and father have 4 children it is
Very likely two will be cariers of sickle cell and
the other two will be sufference of Sickle cell. It is
iniposible for to have achild together without sickle
Cell because the mother and pather must have at leget
one Dominant allele bourester the mather has two
reccessive. If the putter was borrozygous receive all
there children would have sickle cell, haven if he
was homozygen dominant & All of these children
would be carrier of sickle all

Results Plus examiner comment

This candidate answered the question fully and effectively. The Punnett square is clear and the letters easy to distinguish. Percentage outcomes are correctly allocated and the Punnett square explained in detail. The candidate gained all 6 marks here.

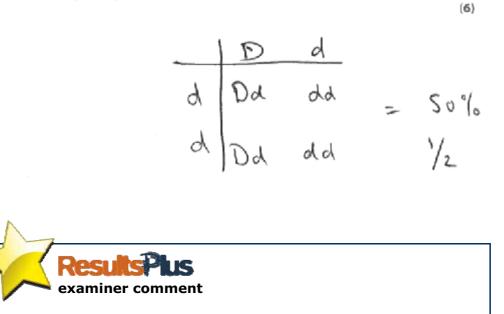


Candidates should ensure that they address all parts of the 6-mark question in order to access all the marks.

*(c) Sickle cell disease is another genetic disorder caused by a recessive allele (d).

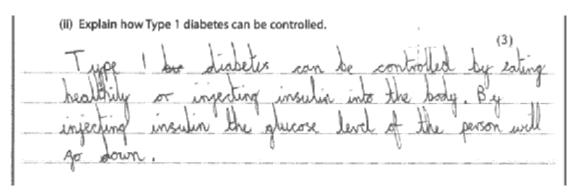
Explain the inheritance of sickle cell disease in a family with a heterozygous father and a homozygous recessive mother.

You should use a genetic diagram or Punnett square and percentage outcomes in addition to your explanation.



As the candidate did not answer the question, which was to explain the inheritance, they could only access mark band 1. 2 marks were awarded here for the correct Punnett square. The percentage outcome was also not explained so no credit could be given as we did not know what it referred to.

Question 6(a)(ii)





This candidate explained the treatment for Type 1 diabetes effectively, with injection of insulin and also a healthy diet to control blood glucose levels, for full marks.

(ii) Explain how Type 1 diabetes can be controlled.	(3)
It someone has type I diabeles then this means that	
their body isn't producing enough glucose. By eating som	serving
sweet (sugary can rise their glucose level and they would h	nave.
to control this by mindling what they eat or orink.	



This candidate had the misconception that diabetics need more glucose rather than controlling their glucose levels. They did go on to say that the glucose levels needed to be controlled so credit was given for this.

Question 6(b)

This calculation was answered well but common errors were not putting the height into metres and also not squaring the height before doing the calculation. Candidates must get into the habit of showing their working as they can gain credit for correct calculations even if the answer is incorrect.

(b) Adrian is 180 cm tall and has a mass of 120 kg. A person who has a high Body Mass Index (BMI) is more likely to develop Type 2 diabetes. Calculate Adrian's BMI using the equation. $BMI = \frac{\text{mass in kilograms}}{(\text{height in metres})^2}$ $\{2\}$ $Bmi = \frac{120}{1.8}$ answer = 66 6666667 examiner comment This was a common error; the candidate did not square the height before doing the calculation. They did carry out their calculation correctly though and showed the working so 1 mark was awarded.

Question 6(c)

Most candidates were able to access this question at some level, with a majority being able to name the neurones involved, but sometimes candidates muddled the order. The role of the synapse was well understood and several candidates were able to explain the role of the myelin sheath in insulating the impulse. Many candidates were also able to explain how impulses travel along neurones and the role of neurotransmitters across the synapse.

*(c) Body movement is controlled by nerve impulses. Explain how impulses are transmitted in a reflex arc to prevent a person from injuring themselves. (6)its torgo body has pricked a pin the sensory on. Cerons up the arm when Letical es is turned Impul Ċ. ich then Synauce then continues Neron Lt En. neet a the process is compled nones to the noter Acu travers down NEWS ann rectory. This harppes ەك SUL bud tell υS んいたい 10 Stop before more Pour (Total for Question 6 = 12 marks) 2'S made. TOTAL FOR PAPER = 60 MARKS



This is a good, clear response. The candidate included clear detail about the path of the reflex arc and also the role of the synapse. The method of travel along neurones as electrical signals was also given, putting the candidate into band 3. Spelling, grammar and the clarity of writing are good so 6 marks were awarded. *(c)Body movement is controlled by nerve impulses.

Explain how impulses are transmitted in a reflex arc to prevent a person from injuring themselves.

(6)Nerve impulses are sent when for example May put your hand on a not pan the he stimulas tells a number the neurones then anumber components until it reaches the (the annul nencus syltem. on block to re motor neurope which w newcore and matha finalu or which remanes the ha hot pan TO preport WINC (Total for Question 6 = 12 marks) TOTAL FOR PAPER = 60 MARKS S 奥-カN-や (NS+r-D -> E



This candidate has put in some detail about the reflex arc but some of this is muddled and out of order so this response goes into mark band 1. The answer is well written and spelling and grammar are correct so 2 marks are awarded.

Summary

In order to improve their performance candidates should:

- read all the questions carefully and look for the key words in the questions to ensure they are answering the question being asked
- show all their working in mathematical questions to maximise their likelihood of gaining some credit
- attempt all questions throughout the paper; move on if there is a question they do not understand
- ensure they use a letter that looks very different in lower case and upper case to clearly show the gametes and offspring when completing genetic diagrams
- try to distinguish between alleles and genes: for each gene there are 2 alleles, which may be different (heterozygous) or the same (homozygous)
- use the number of marks awarded for the questions to focus the mind on the number of points that need to be made
- when asked to discuss a topic, ensure that at least two different points of view are made.

Grade boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx



Further copies of this publication are available from Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467 Fax 01623 450481 Email <u>publication.orders@edexcel.com</u> Order Code UG034037 November 2012

For more information on Edexcel qualifications, please visit www.edexcel.com/quals

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



Llywodraeth Cymru Welsh Government

