

Examiners' Report  
March 2012

GCSE Biology 5BI1H 01

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## **Introduction**

This paper was accessed much better than the November 11 paper, this may be that the candidates were better prepared as they had worked for longer on the content or simply that they have become better at answering the style of questions. The 6 mark questions are proving to be a challenge but many candidates gained all 6 marks with very few responses resulting in no marks. The maths content still proves to be a challenge but the candidates are improving on the percentage calculations and the calculations of mean.

## Question 1 (a) (ii)

Overall this was answered well with many candidates gaining both marks for correctly linking nicotine with its addictive properties.

(ii) One part of cigarette smoke acts on receptor sites in the brain.

Explain why it can be very difficult to give up smoking.

(2)

The addictive drug, nicotine, stops the smoker being able to stop smoking as it makes the body think it needs it.



**ResultsPlus**  
Examiner Comments

The candidate correctly noted that nicotine was addictive. They could also have gained credit for the idea that the body is craving it.

(ii) One part of cigarette smoke acts on receptor sites in the brain.

Explain why it can be very difficult to give up smoking.

(2)

Because it can become addictive and people think they cannot survive if they do not have it.



**ResultsPlus**  
Examiner Comments

The candidate has only identified that a substance is addictive and can only therefore gain one mark. To gain the second mark the candidate needs to link the addiction with the substance in this case nicotine.

(ii) One part of cigarette smoke acts on receptor sites in the brain.

Explain why it can be very difficult to give up smoking.

(2)

Because blood cells <sup>prefer</sup> ~~like~~ carbon monoxide and ~~they~~ once inhaled people can get addicted and then the body just keeps craving for more cigarettes.



**ResultsPlus**  
Examiner Comments

The candidate has correctly identified the need that a smoker has for cigarettes so gains one mark for doing so. The candidate would need to identify the substance, nicotine or the addiction element to gain the second mark.

## Question 1 (b)

Many candidates confused stimulants and depressants. Candidates would benefit if the differences are reinforced for both alcohol and tobacco.

(b) Smoking cigarettes can have an effect on reaction times.

State the group of drugs which increase the speed of reactions.

(1)

Stimulus



**ResultsPlus**  
Examiner Comments

The candidate has clearly mistaken the answer, they should have given the type of drug, in this case stimulant but because the term stimulus has a different meaning we cannot accept it in this context.

(b) Smoking cigarettes can have an effect on reaction times.

State the group of drugs which increase the speed of reactions.

(1)

Stimulants.



**ResultsPlus**  
Examiner Comments

Even though the candidate has spelt stimulant incorrectly the mark was still awarded as the term was judged to be close enough to be awarded the mark.

## Question 1 (c)

The answers to this question were very pleasing with many candidates recognising carbon monoxide binds to red blood cells and that this reduces the oxygen carrying capacity of the blood.

(c) Cigarette smoke contains carbon monoxide.

Explain the effect of breathing in carbon monoxide on the function of the blood.

(3)

When you smoke you inhale carbon monoxide, this is bad because instead of having oxygen in your body you have ~~too~~ this toxic gas. Also this carbon monoxide gets into your cells, oxygen can't be carried around the body. There is also tar build up in the lungs. This cause heavy breathing.  
Need O<sub>2</sub> for respiration (Total for Question 1 = 7 marks)



### ResultsPlus Examiner Comments

The candidate has not been awarded the mark here, they have stated that oxygen cannot be carried around the body, in this case this is incorrect. If the candidate had said less oxygen is carried around the body we could award the mark.



### ResultsPlus Examiner Tip

Be specific when answering an explain question. In this case details of the red blood cells and/or the haemoglobin were needed.

(c) Cigarette smoke contains carbon monoxide.

Explain the effect of breathing in carbon monoxide on the function of the blood.

(3)

Carbon monoxide reacts permanently with hemoglobin in the red blood cells. The red blood cells carry oxygen around the body, but when carbon monoxide has reacted with the blood cells, less oxygen can be carried around the body.

(Total for Question 1 = 7 marks)



**ResultsPlus**

**Examiner Comments**

An excellent response hitting all of the marking points. The candidate was clear in the response.

## Question 2 (b)

Candidates often missed a mark here by referring to this as a chemical signal rather than an electrical one. Candidates are expected to know that electrical impulses pass down the neurones and chemical across the synapse.

(b) Explain how information travels along the axon of a sensory neurone.  
~~The~~ <sup>the information</sup> is sent along the axon as an electrical<sup>(2)</sup> impulse).  
when the receptor detects a stimulus, the impulse is sent along the axon of the cell to the relay neurone (CNS). The axon has myelin sheath around it which acts as an insulating layer to stop impulses from being



### ResultsPlus Examiner Comments

The candidate clearly identifies the information carried as an electrical impulse, a signal would also be acceptable for the mark. They then go on to state where it travels to (the relay neurone / CNS) so both marks are given. The candidate could also have gained credit if the region the impulse was travelling from was mentioned e.g. receptor cells in a sense organ.



### ResultsPlus Examiner Tip

Only information required by the question should be in the answer.

(b) Explain how information travels along the axon of a sensory neurone.

(2)

Information travels along the axon of a sensory neurone quickly to make the body reflex/react to something in order to protect the body.



### ResultsPlus Examiner Comments

The candidate does not gain any marks here as they have not mentioned the method of travel or where it goes to or from.



## Question 2 (c)

(c) Describe the role of the myelin sheath.

(2)

Myelin Sheath ~~is~~ acts as a transmitter from the receptor cell to the sensory neurone. It is like an electrical wire.



**ResultsPlus**

**Examiner Comments**

This question is specifically about the myelin sheath so the response needs to be specific about the role of the myelin sheath, this answer is too vague.

(c) Describe the role of the myelin sheath.

(2)

The role of the Myelin sheath is to protect the axon from damage and to prevent electrical impulses from leaving the neurone where they shouldn't.



**ResultsPlus**

**Examiner Comments**

This is a good answer, the role of the myelin sheath is mentioned, as is its location on the axon so this gains both marks.



**ResultsPlus**

**Examiner Tip**

When thinking about the myelin sheath it is helpful to refer to the insulation of the axon. Many candidates referred to stopping the impulse escaping but few were able to identify its role directly as an insulator.

## Question 2 (d)

The reflex arc is quite a challenging subject but candidates need to be able to describe this in detail. We did accept the basic nerve pathway diagram here for full marks but examiners also saw many responses which were very detailed and showed some very impressive knowledge.

(d) Describe the pathway of a nerve impulse through a reflex arc.

(3)

nerve impulses in a reflex arc is like hitting your knee with a hammer then it automatically lifting up. This happens because it hits the nerve, this then travels round the senses to the motor which goes through the CNS and spinal cord which makes your body responds to what has happened. It travels from one part to the other ~~the~~ <sup>through</sup> synapses



**ResultsPlus**  
Examiner Comments

As this is a more discriminating question, we were hoping that the candidates could link each part from where it came from to where it was going. For example from receptors in the skin to the CNS along a sensory neurone. In this case the candidate managed one of these sections.

(d) Describe the pathway of a nerve impulse through a reflex arc.

(3)

Stimulus ~~is~~ → receptor → sensory neurone  
→ relay neurone in the CNS → motor neurone  
→ effector → response



**ResultsPlus**  
Examiner Comments

This is a clear example of a learned response to the reflex arc. It is a nerve pathway diagram which shows all the stages necessary for full marks.

### Question 3 (a) (ii)

For this question the candidates had to correctly read the value off the graph and then calculate the percentage. An error carried forward was allowed if they got the wrong value for 3 (a) (i).

**Variation**

3 (a) The graph shows the variation in eye colour in a human population.

eye colour	number of individuals
blue	7
brown	27
green	4
grey	1
hazel	1

(i) How many individuals had their eye colour recorded in this human population?  
Put a cross (☒) in the box next to your answer. (1)

A 7  
 B 27  
 C 30  
 D 40

(ii) Calculate the percentage of individuals with brown eyes in this human population. (2)

~~27~~  
40

$0.27 \times 40 = 10.8$

answer = 10.8 %



#### ResultsPlus Examiner Comments

In this case although we can assume that 27 was read off the graph correctly, (they actually stated 0.27) the candidate failed to use an appropriate method to calculate the percentage so no marks were given.

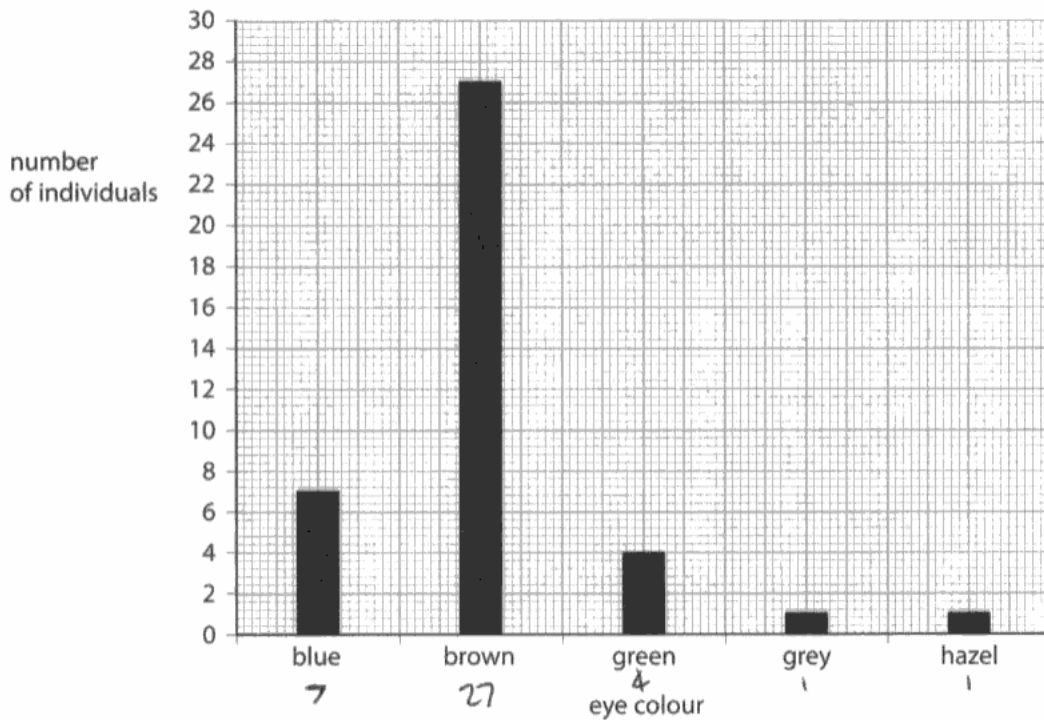


#### ResultsPlus Examiner Tip

Always show your working in calculations, this may gain you a mark even if you get the calculation wrong.

### Variation

3 (a) The graph shows the variation in eye colour in a human population.



(i) How many individuals had their eye colour recorded in this human population?

Put a cross (☒) in the box next to your answer.

(1)

- A 7
- B 27
- C 30
- D 40

(ii) Calculate the percentage of individuals with brown eyes in this human population.

(2)

$$\frac{27}{40} \times 100 = 67.5$$

answer = 68 %



### ResultsPlus Examiner Comments

The candidate has read off the correct amount of 27 and they completed the calculation correctly. They then rounded 67.5% to 68%, gaining both marks.



### ResultsPlus Examiner Tip

Be very careful if you round up figures that you do this correctly. If an answer of 67% was given here with no working this would not be credited.

### Question 3 (b) (i)

This question was accessed extremely well. Candidates are becoming much more adept at completing Punnett squares appropriately. Candidates are also getting much better at reading the instructions for using the correct letters.

(b) An individual's eye colour is determined by the alleles they inherit from their parents.

A female parent with the genotype (**bb**) had blue eyes and a male parent with the genotype (**Bb**) had brown eyes.

(i) Complete the Punnett square to show the gametes of the parents and the genotypes of the offspring.

(2)

		Female gametes	
		b	b
Male gametes	B	Bb	bB
	b	Bb	bb



**ResultsPlus**  
Examiner Comments

The candidate was awarded a mark for the correct offspring. Unfortunately they mixed up the gametes.

(2)

		Female gametes	
		B	b
Male gametes	B	BB	Bb
	b	Bb	bb



**ResultsPlus**  
Examiner Comments

Unfortunately this candidate used the incorrect gametes and therefore could not attain the marks for the correct offspring.

### Question 3 (b) (ii)

Although the correct answer here was requested as a probability, marks were also given for percentage outcomes and fractions.

(ii) If these two parents have one child, state the probability that this child would have blue eyes. (1)

The Probability that this child would have Blue eyes is 50%.



**ResultsPlus**  
Examiner Comments

50% gave the candidate the mark.

(ii) If these two parents have one child, state the probability that this child would have blue eyes. (1)

$(\frac{1}{4})$  25% chance that the child would have blue eyes.



**ResultsPlus**  
Examiner Comments

This was the incorrect response so no mark was awarded.

### Question 3 (b) (iii)

The expected answer to this question should be homozygous recessive, which may be insisted upon in future series. However as candidates were often writing either homozygous or recessive the marks were given for either of the terms as they were correct just not in as much detail.

(iii) Give the genetic term that describes the genotype (bb). (1)

~~homozygous~~ recessive



**ResultsPlus**  
Examiner Comments

Clear example of a correct answer.

### Question 3 (c)

This is a new topic for this specification and it was pleasing to note that many candidates had grasped the idea of speciation as a result of geographical isolation. There was a problem here that many candidates believed that the organisms adapted to the environment not that they had characteristics which enabled them to survive better.

(c) Variation may arise due to the geographic isolation of a species.

Explain how geographic isolation of members of one species can lead to a new species evolving.

(3)

Using animals on an island as an example, the island may become divided by physical features, e.g. a mountain range. This would cause the animals to be split into 2 groups. The conditions of the two parts of the island may be different, i.e. one side may be wet and ~~the other~~ <sup>the other</sup> hot. Over a period of time, the animals would adapt to their environment, developing different characteristics and thus, a new species ~~is~~ <sup>would</sup> evolved.



**ResultsPlus**  
Examiner Comments

The candidate gained one mark here for recognising that there were two different environments. They clearly did not have a good understanding of survival of the fittest in this instance though.

Environmental factors (such as the food available and weather conditions) make certain characteristics advantageous. Those in a species that inherit them survive to reproduce, and pass them on to their offspring. Eventually the genetic differences means a new species must be recognised. This process is known as speciation.



**ResultsPlus**  
Examiner Comments

This candidate has a clear understanding of speciation and has gained all three marks for this question.

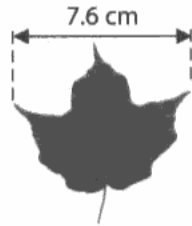
### Question 4 (a) (i)

Many candidates still struggle with the mathematics of calculating a mean. Several candidates used the mode or median in this question.

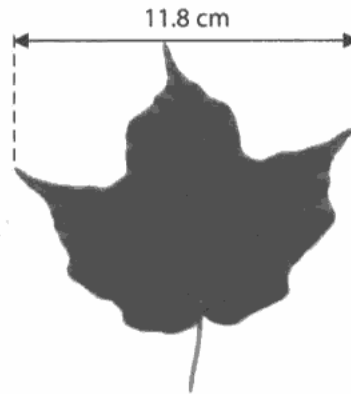
#### Environmental recycling

- 4 (a) Plant A was grown in soil with a low concentration of nitrates.  
Plant B was grown in soil with a high concentration of nitrates.

Andrew measured the width of a leaf from each of the plants.



leaf from plant A



leaf from plant B

- (i) Andrew removed two more of the leaves from each of the plants and measured their width.

The results are shown in the table.

plant	leaf width / cm			mean
	1	2	3	
A	7.6	7.3	7.0	7.3
B	11.8	10.3	11.2	

Calculate the mean leaf width for plant B.

(2)

Handwritten student work showing the numbers 10.3, 11.2, and 11.8. The number 11.2 is circled, and arrows point to it from the other two numbers, indicating the student has chosen the median.

Handwritten student work showing the answer: answer = 11.2 cm



**ResultsPlus**  
Examiner Comments

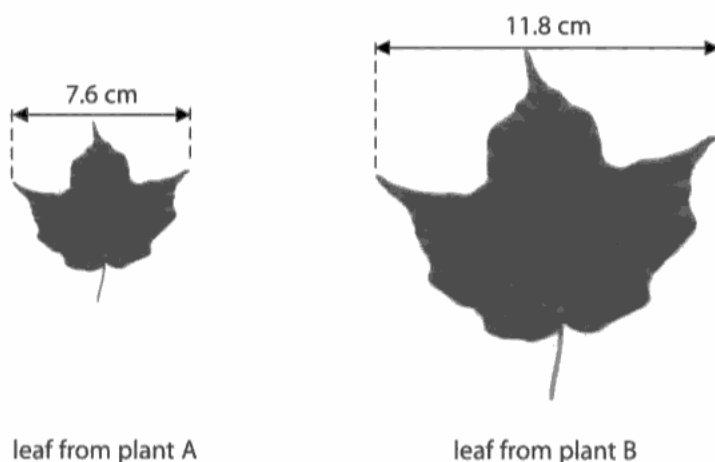
The candidate here has clearly gone for the middle number - the median and therefore no marks could be awarded.



### Environmental recycling

- 4 (a) Plant A was grown in soil with a low concentration of nitrates.  
Plant B was grown in soil with a high concentration of nitrates.

Andrew measured the width of a leaf from each of the plants.



- (i) Andrew removed two more of the leaves from each of the plants and measured their width.

The results are shown in the table.

plant	leaf width / cm			
	1	2	3	mean
A	7.6	7.3	7.0	7.3
B	11.8	10.3	11.2	

Calculate the mean leaf width for plant B.

(2)

$$\begin{array}{r} 11.8 \\ + 10.3 \\ + 11.2 \\ \hline 33.3 \div 3 \end{array}$$

answer = .....11.1.....cm



**ResultsPlus**  
Examiner Comments

A clear example of a good answer. Note that the candidate has shown the working here which means that even if they calculated the mean incorrectly credit could be given for the calculation.

### Question 4 (a) (ii)

To gain the first mark here candidates had to correctly link the increase in growth to the increase in nitrate concentration. For the second mark the linking of nitrates to growth or protein formation was needed.

(ii) Explain the differences in the mean width of the leaves from plant A and plant B.

(2)

Plant A, grown in soil with a low concentration of nitrates, has shorter width of leaves than Plant B that's grown in soil with a high concentration of nitrates.



**ResultsPlus**

**Examiner Comments**

This is the reverse argument of the first marking point so one mark was given for this.

### Question 4 (c)

This question divided the candidates. Generally those attaining a C grade were able to access two or three marks by noting the role of either nitrogen fixing or nitrifying bacteria. Those working at a higher level were able to access all four marks.

(c) Explain how different types of bacteria act to increase nitrate concentration in the soil.

(4)

Nitrogen fixing bacteria take nitrogen from the atmosphere and turn it into nitrates which would increase the nitrate concentration in the soil.



**ResultsPlus**

**Examiner Comments**

Although a short response, there is enough for two marks.

## Question 4 (d)

Candidates found this question a little challenging and many confused carbon dioxide and nitrates.

(d) Name the process by which bacteria release carbon dioxide into the atmosphere.

(1)

Photosynthesis.



**ResultsPlus**  
Examiner Comments

A clear example of the correct answer.

(d) Name the process by which bacteria release carbon dioxide into the atmosphere.

(1)

Eutrophication



**ResultsPlus**  
Examiner Comments

The candidate appears not to have read the question and related it back to the previous question on nitrates.



**ResultsPlus**  
Examiner Tip

Read each question carefully.

### Question 5 (a) (ii)

This was often misread and the candidates wrote down the kingdom animalia or the genus/species of the panther. Candidates should know that the phylum is chordata as this is a separate specification point, it is the only phyla they are expected to know.

(ii) State the phylum that includes mammals such as tigers. (1)

vertebrates



**ResultsPlus**  
Examiner Comments

Candidate confused about what the phyla was, as opposed to the vertebrate group.

(ii) State the phylum that includes mammals such as tigers. (1)

~~Animalia~~ Chordata - vertebrates



**ResultsPlus**  
Examiner Comments

The candidate has listed two answers, thus they cannot be awarded the mark.

## Question 5 (b)

This question was answered well although there was some confusion between the different kingdoms and several candidates confused prokaryota with protocista leading to them losing one of the two marks.

(b) Bacteria are classified as prokaryotes.

State **two** characteristics of prokaryotes. (2)

1. they are multicellular.

2. they ~~are~~ are used to decompose dead organisms.



**ResultsPlus**  
Examiner Comments

An example of a common error where candidates often confused other kingdoms in their response.



**ResultsPlus**  
Examiner Tip

Make sure you know the 5 main kingdoms or organisms and their characteristics.

(b) Bacteria are classified as prokaryotes.

State **two** characteristics of prokaryotes. (2)

1. unicellular

2. they have a nucleus.



**ResultsPlus**  
Examiner Comments

An example of a correct answer which gained one mark for unicellular.

(b) Bacteria are classified as prokaryotes.

State **two** characteristics of prokaryotes.

(2)

1. they don't have a nucleus

2. they have cell walls.



**ResultsPlus**  
Examiner Comments

There were several references to cell walls in many of the candidates' answers but as some do and some do not we could not credit this answer for the mark. The candidate does gain one mark here for the fact that prokaryotes do not have a nucleus.

## Question 5 (c)

Overall most candidates gained at least one mark on this question. They were able to access the hybrid mark or the mark that some species had characteristics from several different groups. There were several references to viruses here but this was not credited as the question specified living organisms and viruses are not considered to be living.

(c) Explain why it is difficult to classify some living organisms.

(2)

As they might be from two different species which has interbred like a duck-billed platypus this is from a duck and a platypus.



**ResultsPlus**

**Examiner Comments**

Candidates were given credit for responses that included organisms which do not fit easily into any of the main groups. This candidate gained one mark for the reference to the duck billed platypus even though they did not state it had characteristics from more than one vertebrate group.

(c) Explain why it is difficult to classify some living organisms.

(2)

Some living organisms may have bred with a different organism to create a fertile offspring known as a hybrid. Hybrids are very hard to classify as they are a mixture of the two species.



**ResultsPlus**

**Examiner Comments**

The candidate gained the mark here for the reference to hybrids being produced. They could not gain another marking point because they needed to be specific that closely related species can breed with each other not just different organisms.

## Question 5 (d)

Overall the majority of candidates gained some marks on this question, the stronger candidates generally scoring four to six marks and the weaker two to four marks. Problems existed where there was a lack of sufficient detail or where the candidates did not relate the features to specific groups however in these cases the candidates did not lose all the marks.

\*(d) Describe how scientists classify vertebrates into different groups.

(6)

Scientists classify vertebrates (animals with a backbone) in to ~~certain~~ different groups, this is because some vertebrates have different characteristics compared to others which place them into different groups.



**ResultsPlus**

**Examiner Comments**

This candidate has correctly stated that vertebrates have a backbone but this was not what the question was asking. The question required the responses to be about the way in which the vertebrates were classified. The candidate then goes on to state that they have some different characteristics. This is too vague to put them into level 1.



**ResultsPlus**

**Examiner Tip**

It is essential that candidates make specific references in the 6 mark questions and do not just give a vague open response.



\*(d) Describe how scientists classify vertebrates into different groups.

(6)

Scientists classify vertebrates into different groups depending on how they reproduce, for example Oviparous, birds, how they obtain heat regulate their body temperature, for example ~~homeo~~ poikilotherms, snakes, and how they breathe, for example gills, fish. Vertebrates are classified into smaller groups mammals, reptiles, amphibians, birds and fish. ~~amphibians~~ Vertebrates are also reclassified into different groups based on if they use internal fertility or external fertility.



### ResultsPlus Examiner Comments

This candidate has accessed level 3 as they have managed to give clear descriptions of the ways in which vertebrates are classified, they have also related the method of classification to specific groups. As the clarity of the answer is good and the scientific language is advanced they scored full marks.

\*(d) Describe how scientists classify vertebrates into different groups.

(6)

Mammals are a ~~group~~ group of living organisms that are warm blooded and reproduce a live young.  
Reptiles are cold blooded, have ~~scaly~~ rough, scaly exterior and lay eggs.  
Amphibians live both in land and water, they have a soft exterior and they lay eggs.  
Birds have feathers, are warm blooded, lay eggs etc.  
Fish ~~you~~ use gills to breathe, lay eggs and are cold blooded.



### ResultsPlus Examiner Comments

This candidate is put clearly into level 2. They have given some physical characteristics of vertebrates (as they would classify them in key stage 3) and they have then gone on to give a simple description of the methods of classification of the vertebrate groups. The answer is clear so the candidate gets four marks.

\*(d) Describe how scientists classify vertebrates into different groups.

→ what are they?

(6)

Scientists classify vertebrates into different groups. Vertebrates are animals that have a spinal chord. They are split into 5 different groups. These are mammals, amphibians, reptiles, birds and also fish. This Scientists use the groups by splitting them into the groups and looking at which animal belongs to each group. For instance, tigers are mammals because they have a spinal chord ~~and~~ and also have fur. This is how Scientists classify vertebrates into different groups.

(Total for Question 5 = 12 marks)

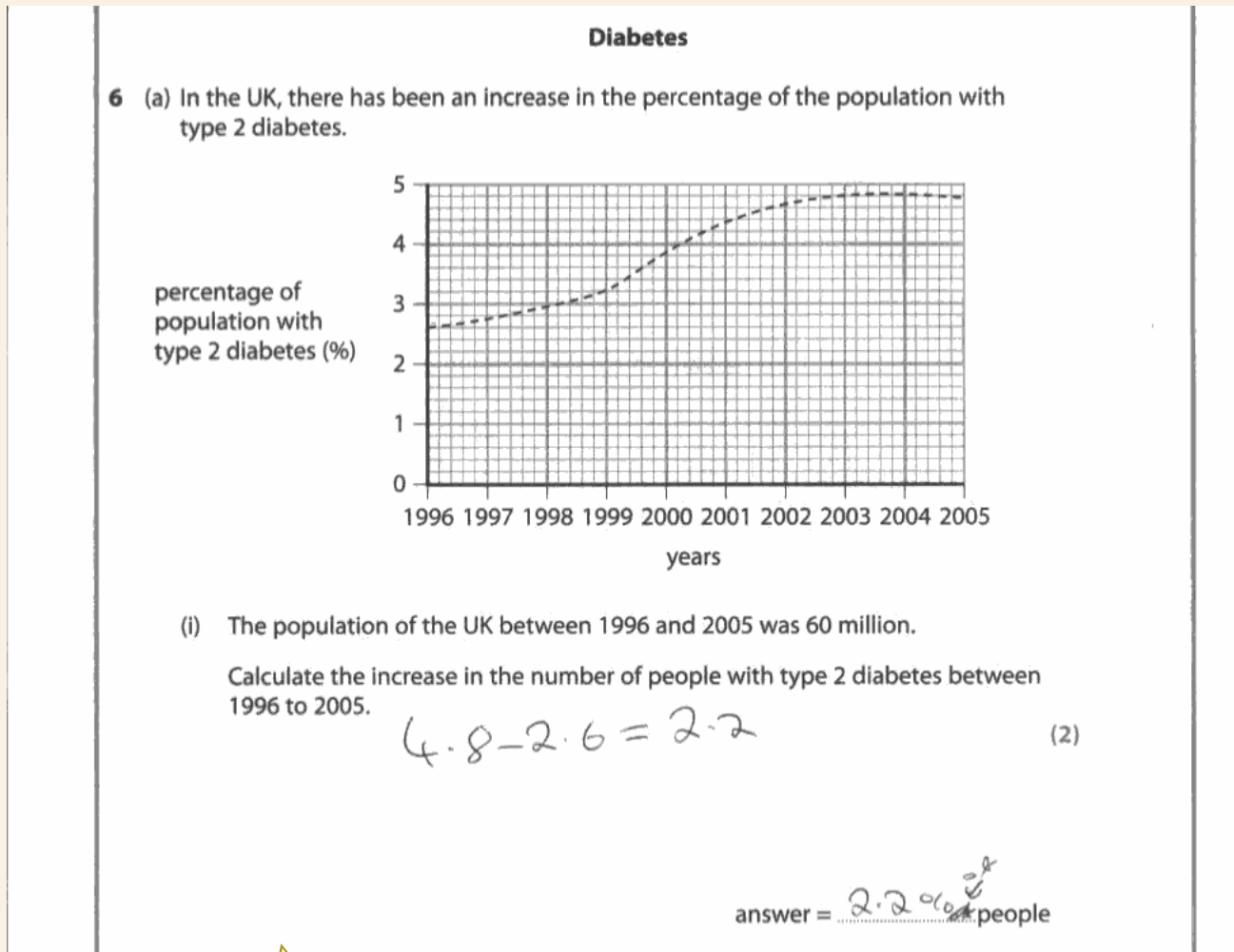


**ResultsPlus**  
Examiner Comments

This is a good example of how a candidate can be placed in level 1. They have given an answer which specifies the vertebrate groups and they have also given a little bit of detail 'mammals like tigers have fur'. The answer is clear and although there are minor errors the candidate still gains two marks.

### Question 6 (a) (i)

Generally this question was well accessed with candidates gaining at least one mark. Calculations involving large numbers especially when related to populations did seem to cause a problem.

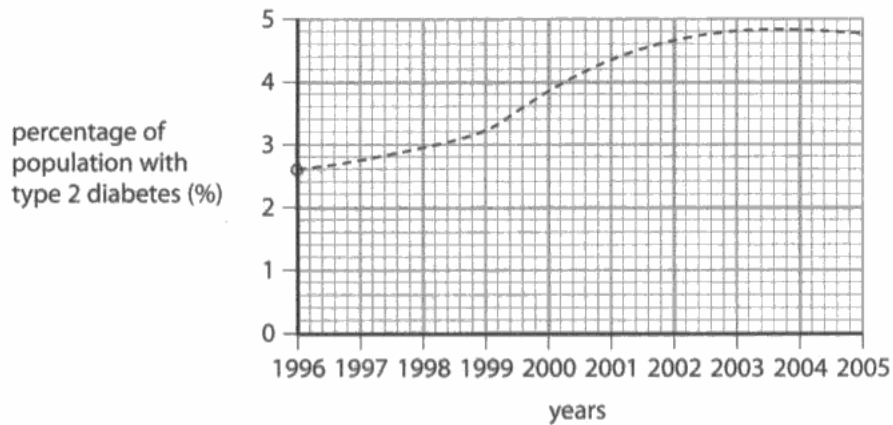


#### ResultsPlus Examiner Comments

The candidate here gained one mark for the reading from the graph and coming up with 2.2. This was given even if the candidate then did something wrong with the final calculation. A clear example of where showing your working is essential.

### Diabetes

- 6 (a) In the UK, there has been an increase in the percentage of the population with type 2 diabetes.



- (i) The population of the UK between 1996 and 2005 was 60 million.

Calculate the increase in the number of people with type 2 diabetes between 1996 to 2005.

$$1\% = 600,000$$

$$2.6 \quad 2.6\% \text{ of } 60,000,000 = 1,560,000$$

$$4.8 \quad 4.8\% \text{ of } 60,000,000 = \underline{2,880,000}$$

(2)

$$\begin{array}{r} 360,000 \\ 2,400,000 \\ 480,000 \\ \hline 2,880,000 \end{array}$$

answer = 1,320,000 people



**ResultsPlus**  
Examiner Comments

A good clear answer with all the working shown.

### Question 6 (a) (ii)

This question was well accessed by all candidates. Most candidates were able to state that obesity is a cause of type 2 diabetes or that people are not taking enough exercise and eating the wrong types of food.

(ii) Suggest **two** reasons for this increase in the number of people with type 2 diabetes.

(2)

It may be because as a diabetic person has a baby and the baby contains that diabetic persons gene it is likely for the baby to have diabetes as he grows as well.



**ResultsPlus**  
Examiner Comments

The candidate here has confused type 1 and type 2 diabetes and has started talking about type 2 diabetes being inherited.

(ii) Suggest **two** reasons for this increase in the number of people with type 2 diabetes.

(2)

More people are eating unhealthily (including excess sugary foods) as it is often cheaper and easier.

~~More~~ Fewer people exercise regularly, as they rarely feel they have time.



**ResultsPlus**  
Examiner Comments

A clear example of a correct response for two marks.

## Question 6 (b)

At this stage in the paper the candidates must give a clear explanation including how the thing they are suggesting would control the glucose levels in the blood. It was not enough to say diet but they must link the diet to why this would have an effect on the glucose levels.

(b) Explain how type 2 diabetes can be controlled without the use of drugs.

(2)

Type 2 diabetes can be controlled without the use of drugs by having a healthy diet and lifestyle, such as eating less sugary foods.



**ResultsPlus**  
Examiner Comments

The mark is given here for the link to diabetes and eating less foods containing glucose. One mark was awarded.

(b) Explain how type 2 diabetes can be controlled without the use of drugs.

(2)

For Type 2 diabetes can be controlled without drugs by keeping doing exercise to stay healthy and having a healthy diet so the blood glucose levels can stay at a regular level.



**ResultsPlus**  
Examiner Comments

The candidate gained one mark here for relating the increased exercise to the control of blood glucose levels.

(b) Explain how type 2 diabetes can be controlled without the use of drugs.

(2)

If you decrease the amount of junk food consumed and other fatty foods it would help decrease the amount of people with type 2



**ResultsPlus**  
Examiner Comments

As the candidate has not related the diet to the effect on blood glucose levels there are no marks given here.

## Question 6 (c)

This question was well answered by the majority of candidates although there was some understandable confusion with glucose, glucagon, glycogen. These mistakes did not negate the candidates reaching a particular level, but did act to show that there was a lack of clarity in their answer and thus put them to the bottom of the level.

\*(c) Explain how blood glucose levels are controlled in people who do **not** have diabetes.

(6)

In a normal body, Peoples level of glucose is controlled by the liver and the pancreas. If the blood sugar level becomes too ~~high~~ <sup>low</sup>, the liver will release glycogen and ~~insulin~~ <sup>hormone</sup> into the blood which is converted into glucose therefore restoring normal levels of glucose in the blood. If the sugar levels are too high, the pancreas will release glucagon to reduce the level of glucose in the blood, restoring normal sugar levels in the blood.



**ResultsPlus**  
Examiner Comments

In this response the candidate is clearly confused about the role of the organs and the role of the hormones involved. They do however have an idea about how glucose levels are controlled and therefore were put into level 1. The response was awarded one mark because of the many misconceptions in the answer.



\* (c) Explain how blood glucose levels are controlled in people who do **not** have diabetes.

(6)

Blood glucose levels are controlled when the level of glucose is too high in your blood insulin is released from the pancreas to reduce the amount of glucose in your blood. However, when your blood sugar levels are too low glucagon is added to the blood to increase the amount of glucose. A change in the blood glucose levels are detected by negative feedback which detects a change in your body and triggers a response to it, this is when insulin or glucagon is either added to your blood to maintain a stable amount of blood glucose in your body.



**ResultsPlus**  
Examiner Comments

This is a good answer which shows the two control mechanisms. However it does not give the detail of the role of the liver and glycogen in the process so is a level 2 answer. Overall the answer is clear and there is good use of scientific terminology so the candidate gains four marks.

\*(c) Explain how blood glucose levels are controlled in people who do **not** have diabetes.

pancreas = insulin, glucagon

(6)

One way blood glucose levels

If the blood glucose level is too high, the pancreas would release insulin into the blood <sup>stream</sup> travelling towards the liver. The hormone insulin would tell the liver to absorb the glucose to convert it into glycogen. This brings the blood sugar level down.

If the blood glucose level is too low, the pancreas would release glucagon into the bloodstream. It would travel to the liver. The hormone glucagon will tell the liver to convert the glycogen into glucose. The liver would release the glucose making the blood sugar level back to normal (higher).



**ResultsPlus**  
Examiner Comments

This is an example of a clear and correct response to the question, both methods of control are mentioned and the roles of the organs and the hormones are accurate.

## Paper Summary

Question 1 on disease was answered well with the majority of candidates able to recognise tar as a carcinogen and the effect of nicotine as an addictive substance. Categorising drugs seems to be a problem especially with nicotine as many responses referred to it as a depressant. About 45% of candidates were able to give complete detail about how carbon monoxide affects the oxygen carrying capacity of the blood and that it binds to red blood cells. There was some excellent scientific knowledge shown by stronger candidates.

Question 2 on the nervous system did cause some problems with identification of neurones and their roles. Many candidates were able to recognise that information travels as electrical impulses, although a few are still confusing the chemical transmission across the synapse with the movement along the neurone. The myelin sheath question was less well answered although it was pleasing to note the numbers of candidates who were able to link the structure to its function effectively. Some candidates struggled with the nerve pathway but still managed to gain one mark here for the impulse moving from one region to another.

Question 3 on variation showed evidence that the analysis questions are being accessed by the majority of the candidates although the percentage calculations still prove to be a problem. It was very pleasing to note that candidates are extremely good at completing a Punnett square with a good majority giving the correct outcomes and correctly giving the probability. The question on geographic isolation resulted in some very interesting responses. Many candidates gained one mark for mentioning the different conditions between one area and another. There was some confusion regarding the adaptations with many candidates believing that when moving to a new area the organisms will adapt to the environment themselves.

Question 4 on environmental recycling and the calculation of the mean were well accessed as was the use of nitrates to produce proteins. The different bacteria which are involved in the nitrogen cycle were accessed well with at least two marks being gained.

Question 5 on classification shows that candidates have a good knowledge of binomial classification and candidates were able to work well at the classification of vertebrates into groups.

Question 6 on diabetes caused a few calculations of the number of people with type 2 diabetes and the way in which the blood glucose levels were controlled were well done although a little confused.

## **Grade Boundaries**

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

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