

Examiners' Report November 2012

GCSE Biology 5BI1F 01

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November 2012

Publications Code UG034034

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Introduction

This paper for the November series examined a range of biological topics from the B1 specification. Attempting to bring learning to life and into the real world, the examination was written to allow candidates to access these topics in a variety of answering styles.

The aims of this paper were to allow access to all questions for all candidates from a range of G-grade to C-grade. Q1 and Q2 were assessed out of 8 marks each; Q3 and Q4 10 marks each and Q5 and Q6 12 marks each, totalling 60.

Successful candidates were able to answer the MCQs (8 in total) and to attempt the 6-mark-style questions to a mid-high standard. The suggestion-style questions were also accessed well by successful candidates. Future teaching should highlight the need for biological mathematics, use of biological terminology and handwriting practice.

Classification has always been a popular question to ask candidates and Q1 on this examination paper focused on bacteria, viruses and vertebrate groupings based upon reproductive methods and oxygen absorption methods. Candidates do seem to enjoy answering these, possibly due to the topic featuring early in the specification.

The environment and issues surrounding the ever-changing environment were answered relatively successfully by this series' candidates. Q2 focused on issues surrounding recycling and the production of carbon due to human activities; Q4 asked candidates to discuss and suggest reasons behind bee evolution and the natural antiseptics they can produce.

Human biological processes were also a focus of this series. Q3 was based on the inheritance of eye colour in a family; it asked candidates to explain the reasons why an offspring's genotype cannot be homozygous dominant, and also to assess a pedigree chart and explain family relations in terms of monozygotic twin heritage. Q5 centred on the regulation of blood glucose, with graphical interpretation to begin with, followed by a 6-mark question on how Type 1 and Type 2 diabetes are controlled.

The nervous system and how drugs affect the nervous system were the focus in Q6. The 6-mark question in part (c) seemed a good discriminator between C-grade and G-grade candidates.

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

Question 1(b)

This question focused on the processes by which viruses spread disease once they have entered their host. Many candidates highlighted the fact that viruses spread disease or infect an individual, which was creditworthy from marking point 2. By far the most popular answer from candidates was the process of replication or multiplication of the virus. Few candidates appreciated the entrance of the virus into a host's cell and even fewer recognised that viruses manipulate DNA of a host cell.

Many candidates simply suggested reasons why viruses were not classified into a kingdom. This was not the essence of the question.

(b) Viruses are not classified into any kingdom.

Describe what a virus does after it has entered its host.

(2)

When a virus enters a cell, it changes the way the cell works and also makes the cell make copies of the virus. Moreover viruses don't show any of the live processes such as growing or reproduction.



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examiner comment

This candidate has recognised that the virus enters a cell (marking point 1) and that the virus will change the workings of the host cell (marking point 4); these were comments that were not often given and it was pleasing to see that a candidate had written them here. The candidate also went on to suggest that the cell had been changed in order to make copies of the original virus; this would have accessed marking point 3 as well.

This is a very detailed and accurate answer worthy of 2 marks.



ResultsPlus
examiner tip

This candidate has expressed their answer concisely, coherently and also in clear handwriting. This makes assessment more straightforward for examiners.

(b) Viruses are not classified into any kingdom.

Describe what a virus does after it has entered its host.

(2)

When a virus enters the host it then spreads
but because its a non-living organism ~~it does not~~



ResultsPlus
examiner comment

Unfortunately, this candidate has not specified what is being 'spread'. If it was disease, this would have scored marking point 2; if the candidate was intending to suggest that the virus spreads itself due to multiplication, this would have accessed marking point 3. However, there is no suggestion that either of these was intended and the response has therefore scored zero marks.

Question 1(c)(i)

This question focused on vertebrate birthing methods. It asked candidates to use words from the box to complete the sentences that were provided. The words that could be used are all from the B1 specification so none of the distractors should be unfamiliar to candidates. Many candidates accessed this question very well and successful candidates stated that oviparous organisms lay eggs and viviparous give birth to their young.

(c) All vertebrates have a backbone and are classified into groups.

(i) Use words from the box to complete the sentences about one method of classification.

(2)

chordates	oviparous	
viviparous	hybrids	consumers

Once fertilisation has occurred some vertebrates lay eggs.

Vertebrates that lay eggs are known as chordates.

Vertebrates that give birth to live young are known as consumers.



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examiner comment

This candidate has, clearly, guessed the answers. However, this is a good example to show that candidates should ensure that they are writing the exact words that are in the boxes provided. Here, 'consumers' is spelt incorrectly. In B2 it is possible that the differences between meiosis and mitosis could one day be assessed; it would be a shame if candidates were to be uncredited due to spelling inaccuracies. No marks were awarded for this response.

(c) All vertebrates have a backbone and are classified into groups.

(i) Use words from the box to complete the sentences about one method of classification.

(2)

chordates	oviparous	
viviparous	hybrids	consumers

Once fertilisation has occurred some vertebrates lay eggs.

Vertebrates that lay eggs are known as ~~oviparous~~ **oviparous**.

Vertebrates that give birth to live young are known as **viviparous**.



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examiner comment

This response shows that any work that the candidate does not want marked should be clearly crossed out. Any replacement work should then be clearly shown. This candidate has done this well and 2 marks were awarded.



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examiner tip

Always ensure that work that is not to be marked is clearly crossed out and any work that is to be marked in its place is highlighted in some way.

Question 1(c)(ii)

This question was relatively successfully accessed by many candidates. Three methods that scientists use to place vertebrates into groups were provided in the mark scheme; candidates had to describe two to be awarded maximum marks. Candidates could have stated that vertebrates are grouped due to their differences in oxygen absorption (gills, lungs etc), reproductive methods (internal or external methods) or how they regulate their body temperature (homeothermic or poikilothermic).

Many candidates did state that gills or lungs were used to breathe and this was acceptable. Some candidates did, however, repeat what was stated in Q1(c)(i) concerning oviparous and viviparous methods of birth; this was unacceptable.

(ii) Describe **two** other methods scientists can use to place vertebrates into groups. (2)

By using the classification key, ~~the~~ ~~also~~ To see where the vertebrate belongs. Also you could find out which type of species it is eg mammal, reptile etc . . .

(Total for Question 1 = 8 marks)



ResultsPlus examiner comment

Some candidates mentioned the groups of vertebrates that can be used: for example, mammals, birds, fish etc. This was not the idea of the question and thus not worthy of credit. Some candidates, as shown in this response, mentioned that keys could be used. Although this is part of the B1 specification, it is not the correct application for this question.

(ii) Describe **two** other methods scientists can use to place vertebrates into groups. (2)

Another way to classify vertebrates is whether they are Poikilotherms or homeotherms, depending on the body temperature. Another method is internal or external fertilisation, depending on how the egg is fertilized. (Total for Question 1 = 8 marks)



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examiner comment

This was an excellent response as the candidate recognised that vertebrates can be further grouped by the method of thermoregulation; more encouragingly, this candidate has expressed their answer using biological terminology, eg 'homeotherms'.

The candidate has scored further credit by commenting on the type of fertilisation that is employed by various vertebrate groups: either internal or external. This is an excellent answer worthy of 2 marks.

Question 2(a)(i)

This question asked candidates to review the graphical data provided and calculate the increase in the mass of paper recycled between the two dates given. Candidates were very successful on this question, with many scoring the maximum 2 marks.

It is always advisable to show how the answer has been calculated; however, 2 marks were automatically awarded for the correct answer even if no calculations were shown.

Those who calculated an incorrect answer but showed that they had ascertained the correct data figures of 3.0 and 2.5 were awarded 1 mark.

Question 2(a)(iii)

This question was answered relatively successfully as it allowed candidates to suggest why an increase in the mass of paper recycled had been seen.

A number of sensible suggestions were awardable. However, some candidates merely stated that 'paper is reusable' and therefore did not make one of the main points that were available.

The majority of successful candidates suggested that people use paper for everyday products or that recycling of paper was easier than for other materials. Less popular but correct answers were the idea that deforestation can be reduced and that it is cheaper to recycle paper than other materials seen in the graph.

(iii) Suggest **one** reason why a large mass of paper is recycled. (1)

A large mass of paper is recycled because it is ~~reusable~~ re-usable.



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examiner comment

This is a clear example of where a candidate has misinterpreted the question stem. Recycling is allowing paper to be reused and therefore cannot be a suggestion as to why a large mass of paper is recycled. All of the other materials in the graph are reusable as well and therefore this candidate scored no marks.

(iii) Suggest **one** reason why a large mass of paper is recycled.

(1)

Because paper is used alot



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examiner comment

It is clear, especially within a 'suggest' item, that candidates will comment in a number of different ways. This answer clearly accesses marking point 2; however, it is clumsily communicated. This would be the most basic acceptable answer for this question.

Question 2(b)

In this question candidates were required to think, in depth, about the role of micro-organisms within the environment and how they return carbon back to the atmosphere through their respiratory processes. Unfortunately, many candidates did not recognise this requirement and thus the question scored poorly. The marking point that was more successfully secured was the idea that the compost/waste/garden or kitchen material decomposed or decayed once composting had commenced. However, too many candidates merely stated that 'fumes' or 'gases' rose from the composting items. This is clearly an unacceptable answer.

Statements including respiration were very rarely seen.

(b) Composting is a method used to recycle waste from the garden and kitchen.

Explain how composting increases carbon dioxide concentration in the air.

(2)

composting increases carbon dioxide concentration in the air because the waste which is getting composted is released in the open.



ResultsPlus
examiner comment

This candidate has answered the question weakly and has not alluded to the compost decomposing, what is performing the decomposition, or the name of the process. Indeed, the candidate has used half of the answer line reiterating what is found in the stem of the question.

Hence, no marks were awarded.

(b) Composting is a method used to recycle waste from the garden and kitchen.

Explain how composting increases carbon dioxide concentration in the air.

(2)

Composting increases carbon dioxide because as it starts to decompose the little bacteria respire producing more carbon dioxide in the air.



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examiner comment

This is an extremely impressive answer, which is both concise and biologically correct. This candidate has stated that the compost decomposes through the action of bacteria due to respiration. All three marking points were made for a maximum of 2 marks.

This is an example of an excellent answer, which was rarely seen.

Question 2(c)

This question asked candidates to explain how another human activity increased the carbon content of the atmosphere; the mark scheme was relatively open and allowed candidates to make one of three linked statements. The most popular of these three links was the burning of fossil fuels (however, many candidates merely stated 'driving cars', which was clearly unacceptable on its own).

Breathing was also a popular answer, and was the main area of content if a candidate scored just one mark; these references to respiration are clearly difficult for some candidates to grasp.

Fewer candidates stated that deforestation would affect the carbon content of the atmosphere due to less being removed because of a lack of photosynthesis. An increase in carbon dioxide due to deforestation was not accepted.

(c) Explain how **one** other human activity contributes to an increase in carbon dioxide concentration in the air. (2)

~~breathing~~ by running around.
planting by loads of trees
by being in a dirty environment.

(Total for Question 2 = 8 marks)



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examiner comment

This candidate has not quite grasped the idea of the question but has attempted to answer it, which is always advisable. Indeed, if they had expanded on the 'running around' idea, they might have scored 1 mark for the marking point 2 linkage. Unfortunately, there is nothing awardable here so no marks were given.

(c) Explain how **one** other human activity contributes to an increase in carbon dioxide concentration in the air.

One other human activity which contributes to the increase in carbon dioxide concentration in the air is the burning of fossil fossil fuels such as coal. ⁽²⁾

(Total for Question 2 = 8 marks)



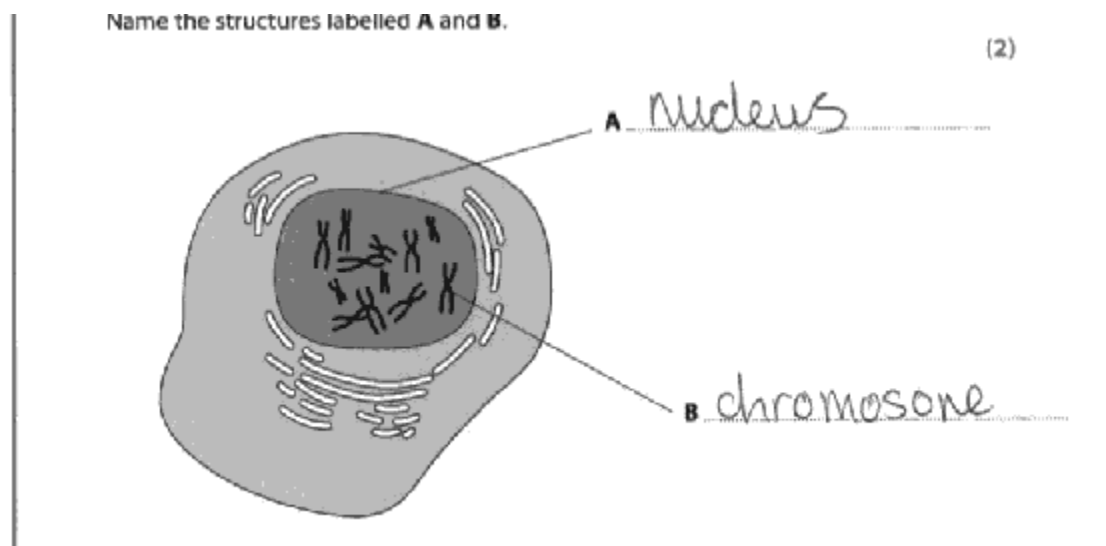
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examiner comment

This candidate has avoided the trap of merely stating that power stations increase the carbon content or that driving cars increases the carbon content. The burning (marking point 1) of fossil fuels (marking point 2) was perfectly acceptable. Any mention of a fuel scored a mark here; acceptable fuels included wood, oil, petrol, diesel or coal.

This is an excellent and concise answer, which was awarded 2 marks.

Question 3(a)

This question asked candidates to name two structures that they should have been familiar with. Structure A was the nucleus (or nuclear membrane – although this answer was very rarely seen) and Structure B was a chromosome (or chromatid, which was also extremely rarely seen).



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This candidate has been awarded 2 marks. However, it must be noted that more candidates incorrectly spelt Structure B than spelt it correctly. The spelling 'chromosone' was used more times than 'chromosome' – however, this was ignored and the mark was awarded.



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examiner tip

Candidates should be confident with the spelling of these biologically significant words. This is worthy of credit when the 6-mark-style questions are being assessed.

Question 3(b)(ii)

This question seemed to be very challenging for candidates in that a genetically derived word was asked for. The genetic term 'phenotype' was specifically looked for, with no alternative provided. Many candidates simply did not know this term and thus were unsuccessful here.

Question 3(c)(ii)

This question was aimed at stretching the most able on this paper if they were to score both marking points. Candidates were asked to state that due to the fact that Jane had two recessive alleles (bb) there could never be a homozygous dominant genotype in the offspring from the two parents. This is the mark that most candidates scored. The second marking point was rarely found in candidates' work. The idea that the offspring would gain half of the genetic material from one parent and half from the other proved to be a difficult concept to grasp.

The use of 'gene' for the word 'allele' was allowed in both marking points.

(ii) Explain why none of the children of Jason and Jane have the genotype **BB**.

(2)

Because when their genes combined the amount of recessive alleles outnumbered that of the dominant allele. And the kids inherited more genes from the mother.



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examiner comment

This candidate is not incorrect when they state that there are more recessive alleles in the parental genotypes than dominant, but they have not expressed the idea that the offspring would have gained half of the genetic material from each parent. Equally, they have not identified which parent had the homozygous recessive combination.

(ii) Explain why none of the children of Jason and Jane have the genotype BB.

(2)

Because Jason is Bb and Jane is bb therefore b is dominant to B. When ~~to~~ ~~from~~ the one chromosome is taken from the mum and one from dad BB can't be an outcome.



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examiner comment

It is clear, especially from this candidate's response, that the answer to this question can be expressed in a number of ways. This candidate has stated that Jane is bb for marking point 1. They have also stated that one chromosome is taken from mum and one from dad, which is essentially scoring marking point 2. However, this answer could have been phrased more efficiently.

Question 3(c)(iii)

This question worked on many levels. The less able candidates were scoring either 1 or 2 marks for stating that Jacob was the identical twin; and also that he and Fred were both male. More able candidates were then clear in their phrasing of the fact that both twins needed to be identical in the alleles they possessed for eye colour. Stating that both of them had blue eyes was not acceptable as Daisy had blue eyes, but was not Fred's identical twin.

Candidates were still able to score, even if they had stated the incorrect child's name. They needed to state that both children were male and that they had the same genotype. Few candidates scored 2 marks after naming the wrong identical twin.

(iii) Fred has an identical twin.

Explain which of the other children is Fred's identical twin.

(3)

Daisy as they both have inherited the same eye colour of blue and they both have the same type of alleles as they are both homozygous.

(Total for Question 3 = 10 marks)



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This is an example of where a candidate has stated the incorrect name of the twin but has recognised that identical twins have to possess the same genes for a characteristic. This is perfectly acceptable for 1 mark as we would not penalise a candidate a further 2 marks for giving an incorrect twin's name.

(iii) Fred has an identical twin.

Explain which of the other children is Fred's identical twin.

(3)

Fred's identical twin is Jacob because they have the same alleles and are the same sex making them completely identical.

(Total for Question 3 = 10 marks)



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This is a very pleasing answer which is both concise and correct. The candidate has used biologically significant terminology to express themselves coherently and concisely. A super response.

Question 4(a)

This was a well-answered question, with many candidates giving the correct response 'photosynthesis'. Recognisable spellings were accepted; however, obvious errors were marked as incorrect. An example is shown here.

(a) Nectar is made from glucose produced by plants.

Name the process that plants use to make glucose.

(1)

Photosyntasjs.



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This candidate has been awarded a mark for stating 'photosyntasjs' – other recognisable spellings included 'fotosynfasis' and 'photasynthesas'. These are all acceptable – but it must be remembered that these would not be accepted within a 6-mark-style question.

Question 4(b)(ii)

This is a suggestion question. Candidates were expected to recognise that as pollen was not stuck to the bee it would use less energy in flying; the bee would be able to fly more easily or aerodynamically; the bee would be less conspicuous to predators; and more nectar would be collected due to more space for this collection. Too many candidates merely stated that 'the bee would not have pollen stuck to them' – a clear copy from the stem of the question. The most popular answer here was some idea from the candidate that 'the bee did not have the burden of carrying pollen from flower to flower'. This was, as we clearly anticipated, suggested in a variety of ways.

We wanted candidates to state that **more** nectar could be collected rather than just 'nectar could be collected'.

(ii) Some bees have evolved a new method of collecting nectar from flowers.

They drill a small hole in the base of the flower and collect the nectar through the hole.

This means the pollen does not stick to the bee.

Suggest why this is an advantage to the bees.

(2)

because the bee won't have to carry pollen and it will be able to collect more nectar



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examiner comment

An impressive answer here where the candidate has stated that the 'bee won't have to carry pollen' (significant removal of statement from the stem of the question – not having it stuck to the bee itself) and also that the bee would be able to 'collect more nectar'.

A fantastic answer and well presented too.

Question 4(c)

This question was very impressively answered. Examiners were simply looking for the one barrier that would be broken by the bee sting. Various alternatives were given, such as epidermis and epidermal layer; however, most candidates specified the word 'skin'. This was very pleasing to see.

Question 4(d)

This question performed well; the idea of hand washing and preparation surface cleaning was what was sought in candidates' responses. Any notion of these was acceptable; again, candidates expressed this in a variety of ways. Marking point 3 was seen less frequently as we were looking for the action of these antiseptics as well. Killing or destroying the bacteria was not grasped very often.

Any vague answers suggesting that bacteria were 'wiped away' or 'taken away' were ignored. In addition to this, candidates could not be awarded marks for the substitution of 'germs' for any micro-organism.

(d) Honey produced by bees is a natural antiseptic.

Describe how antiseptics can be used, during food preparation, to prevent the spread of infections.

(2)

Cook the food properly to stop infection. Like don't put frozen food in the oven because it can cause disease and wash the food ~~beas~~ such as apples because a common house fly might of been on that apple and the house fly carries bacteria and you could digest the bacteria which makes disease occur.



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This candidate has not scored any marks as they have not stated the effect, or method of use, of the antiseptic. Cooking food appropriately is a perfectly good answer to a different question. The candidate has, clearly, taken ideas from the summer examination series about houseflies in an attempt to be successful in this series but to no avail.

(d) Honey produced by bees is a natural antiseptic.

Describe how antiseptics can be used, during food preparation, to prevent the spread of infections.

(2)

Antiseptics could be used on work tops were the food will be placed. And it could also be used on meat to kill all the bacteria. If some house flies land on the food, ^{and the area were it will get prepared} and they contaminate the food so antiseptics could be used to clean the food and the area where food will be prepared.



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This is a rather lengthy response, which scores both marks in the end. The candidate has mentioned the use of the antiseptic on work tops and then added in the last sentence cleaning these work surfaces. They have also mentioned, successfully and gratifyingly, that bacteria would be killed by the use of these antiseptics. A pleasing answer, which is worthy of 2 marks.



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Candidates must remember to think about their answer first and then attempt to communicate their ideas on paper in a coherent and concise manner. This is not a good example of this and the candidate could have easily compromised the marks awarded due to the complexity of the answer.

Question 4(e)

Examiners here were looking for the inclusion of two chemical barrier points from a maximum of four (mention of the word 'acid', 'stomach', 'eyes' or 'tears') and also the mechanism by which this chemical defence protects against infection (ie 'killing bacteria'). Pleasingly, many candidates stated both the type of acid found and its location. A number of candidates scored all five marking points here; this appears to be an accessible area of the specification.

Less able candidates were expected here to name the two areas of the body in which a chemical defence can be found (eyes and stomach); the more able to identify the chemical and its action.

Any mention of saliva, ear wax, mucus or cilia was ignored as these are not chemical barriers.

Question 5(a)(i)

This question required candidates to look at the graph and state an overall trend seen in the graphical data. It was pleasing to see that candidates recognised that examiners were looking for any notion of an overall increase. Too many candidates stated the patterns seen year by year and unfortunately no mark was awarded for these answers. An answer that used the phrase 'positive correlation' was accepted by the examiners. Many candidates also gave a very long sentence when all that was required was a single word. Candidates should remember that if an answer can be expressed with minimal wording, this is what they should do.

(a) (i) Describe the overall trend shown in the graph.

An increase from 1993 to 1995⁽¹⁾
then fall from 1995 to 1996 and then
an increase to 2000



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examiner comment

This is an example of a response from a candidate who has not stated what was asked of them in the question. An overall trend is the difference seen between the beginning and the end of the graph. This answer states an increase, then a decrease followed by a further increase. This is not specifically answering the question set and cannot be awarded any credit.

Question 5(a)(ii)

This mathematical question asked candidates to read two figures off the line graph and subtract them to ascertain the increase in the percentage of the population with Type 2 diabetes. The two numbers 7.5 and 4.5 were required for marking point 1, with the correct calculation of 3% worthy of marking point 2 (or 2 marks fully, with or without calculation work). Many candidates found this calculation challenging; mathematical skills are a vital element of the assessment objectives and this should be noted by candidates and centres.

(ii) Calculate the change in the percentage of the population with Type 2 diabetes between 1993 and 2000.

$$7.5 - 4.5 = 35 \times 100^{(2)}$$

answer = 35 %



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examiner comment

Although seen infrequently, this candidate has scored 1 mark for ascertaining the two required figures from the graph and showing them in a calculation (7.5 and 4.5). Unfortunately, the candidate has then multiplied these by 100 and so cannot be awarded the second marking point.

(ii) Calculate the change in the percentage of the population with Type 2 diabetes between 1993 and 2000.

(2)

answer = 3 %



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This candidate's response scored both marking points and is an example of where 2 marks are awarded when no calculations are shown.



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It is always advisable to complete any mathematical question with the calculations clearly shown.

Question 5(b)(ii)

This question asked candidates to state why Type 2 diabetes is likely to develop if an individual's BMI rises to above 30. Answers ranged from the lower-level 'because having a BMI is considered obese' to higher-level answers that included information on 'lack of physical exertion' and 'the consumption of a poor diet'. Credit was also given to candidates who stated that Type 2 diabetes was a result of insulin resistance.

(ii) Suggest why people with a high BMI may develop Type 2 diabetes.

(2)

They may develop Type 2 diabetes because of their weight and how much glucose they consume



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This candidate has scored 1 mark for stating a derivative of marking point 1. This is only just acceptable for 1 mark. On this occasion, the candidate was awarded the mark because they stated that glucose (or too much) in the diet aided the development of diabetes.

(ii) Suggest why people with a high BMI may develop Type 2 diabetes. (2)

Because they don't have glucose and they eat too much sugary food and don't exercise ~~too~~ often.



ResultsPlus
examiner comment

This is a clear example of a candidate scoring two marking points. They have been concise and coherent in their approach.

'Because they don't have glucose' was largely ignored; however, 'they eat too much sugary food' was worthy of credit for marking point 1 and 'don't exercise often' [sic] was also creditworthy for marking point 2.

Question 5(c)

In this question, candidates were asked to relay their knowledge of the type, diagnosis and control methods of both types of diabetes – the important element here was the differentiation between the two types. Candidates who did not differentiate between the two types of diabetes did not score any marks.

Examiners were looking for references to Type 1 diabetics not being able to produce insulin and therefore relying upon regular insulin injections into a subcutaneous fat layer somewhere on the body. Type 2 diabetic references included the idea of insulin resistance, regular exercise and also controlling the diet to ensure that glucose levels remain low/normal from the outset.

A limited explanation of one type (usually Type 1) would have scored Level 1. If this was communicated effectively with access to simple terminology, a score of 2 marks would have been assigned.

A simple explanation of both types of diabetes and their methods, with clear communication and appropriate use of terminology, would have provided candidates with 4 marks (Level 2).

A more detailed explanation of both types of diabetes and their methods of control was required for all 6 marks (Level 3). Examiners were looking for reference to where insulin should be injected and why exercise/diet control (for Type 2 diabetes) was important.

(c) Describe the different methods that people with Type 1 diabetes and Type 2 diabetes use to regulate their blood glucose concentrations.

(6)

People with Type 1 diabetes do not produce any insulin so they have to inject it into the subcutaneous fat, when they do this their ~~blood~~ insulin level rises and their blood glucose level becomes normal.

Type 2 diabetes is where the human body becomes resistance to the insulin because their body produces too much so to regulate their blood glucose levels they have to have a special diet and exercise well.

(Total for Question 5 = 12 marks)



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This candidate has expressed their answer clearly and has accessed the top marks of Level 3. The answer conveys clarity, scientific terminology and good use of spelling and grammar. The candidate has mentioned the use of insulin injections for Type 1 diabetics and where insulin is to be injected. The candidate has also stated that Type 2 diabetics are resistant to insulin.

This was a fantastically concise and pertinent answer worthy of all 6 marks.

*c) Describe the different methods that people with Type 1 diabetes and Type 2 diabetes use to regulate their blood glucose concentrations.

(6)

Type 1

- Insulin Injection
- Exercise
- healthy diet

Type 2

- Exercise
- healthy diet
- Diabetes medication

(Total for Question 5 = 12 marks)



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examiner comment

This candidate has understood the question and has been awarded Level 2 (3 marks) for scientific content as they have stated, simply, the control methods for both types of diabetes. Unfortunately, this was not conveyed particularly well and list form is not acceptable as a clear method of communication.

Question 6(a)(ii)

This question asked candidates to state the effect that alcohol has on the time taken to respond to a stimulus. Examiners expected candidates to state that the time taken would increase. However, it became apparent very quickly, looking through candidate scripts, that many were stating that response time 'slowed' and so this became an acceptable answer.

(ii) State the effect alcohol has on the time taken to respond to a stimulus.

(1)

reduces your reaction time



ResultsPlus
examiner comment

Unfortunately, it was felt that this candidate had confused themselves with the relationship between an increase in reaction time and a reduction in reaction speed. Therefore, they could not be awarded any credit here.



ResultsPlus
examiner tip

Candidates must recognise the difference between reaction time and reaction speed. When reaction speed increases, the time will decrease and vice versa. This can be quite challenging for some candidates.

Question 6(a)(iii)

This question asked candidates to state the effects of alcoholism on the body. The main ideas examiners were looking for in candidates' responses were brain damage and kidney damage. More specifically, examiners were asked to credit cirrhosis of the liver and ignore 'liver damage' without qualification or reference to cirrhosis.

The idea that a side-effect of alcoholism was addiction was not credited, as essentially this is the same thing.

(iii) Drinking excess alcohol over a long period of time can result in alcoholism.
Suggest **two** long-term effects of alcoholism in the human body. (2)

* Cirrhosis of the liver
* Brain damage



ResultsPlus examiner comment

This answer is an example of where an examiner would give credit for a phonetic spelling of an answer. This is the lowest form of the spelling that was accepted for credit.

Brain damage was also acceptable.

2 marks were awarded.

(iii) Drinking excess alcohol over a long period of time can result in alcoholism.
Suggest **two** long-term effects of alcoholism in the human body. (2)

Slow responses to a stimulus
and can damage your
liver.



ResultsPlus examiner comment

No credit can be awarded for simply mentioning the organ that long-term alcohol abuse can affect. Likewise, slow response cannot gain credit as this would be a very short-term effect of alcohol consumption rather than an effect of abuse over a longer term.

Question 6 (b)

This question was designed to allow candidates to suggest what type of drug caffeine is, its effect on the nervous system and why this effect occurs, in terms of neural transmission. The majority of candidates were able to state that caffeine was a stimulant and that its consumption would decrease one's reaction time (speed up the reaction). Fewer candidates suggested that this was due to the quickening of the transmission or conduction of nerve impulses through neurones.

Other varieties of marking point 2 were accepted such as 'speed up reaction time' or 'quicken up the neurone activity'.

(b) Some people drink coffee containing caffeine after drinking alcohol.

Describe the effects of caffeine on the nervous system.

(2)

It is good to drink something containing caffeine because caffeine is a stimulant and that speeds up your reaction times. Bringing it back to normal.



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This candidate has clearly understood the question and has stated that caffeine is a stimulant for the first marking point. They have then stated that caffeine will speed up reaction time and have therefore scored marking point 2 as well. This answer is quite wordy and would have benefited from being more concise.

However, it is still worthy of 2 marks.

(b) Some people drink coffee containing caffeine after drinking alcohol.

Describe the effects of caffeine on the nervous system.

(2)

caffeine is a type of drug that keeps you awake, alert and speeds up your reaction time. so after having drinking alcohol which slows your reaction time you need something to keep you awake. Caffeine works by sending an electrical impulse to the nervous system ~~is~~ making it alert.



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This candidate has ventured into the territory of suggesting that caffeine will keep an individual more alert and awake. This will never gain credit. They have, however, gone on to state that caffeine will speed up a reaction time.

The candidate almost secured marking point 3 as well but was unsuccessful as they did not qualify their statement in the last sentence with 'sending electrical impulses **more quickly**' and therefore the response scores only 1 mark.

Question 6(c)

This 6-mark-style question asked candidates to explain how various structures of the motor neurone aided the function of neural transmission. Examiners were looking for candidates to give as a simple statement that the impulses (messages or signals) were conducted (passed down) through the axon. Examiners were also providing credit for any idea that the impulses were insulated by the myelination and that this conducted the impulse faster through the axon. Any reference to dendron location and function was also creditworthy as was any correct statement relating to synaptic transmission.

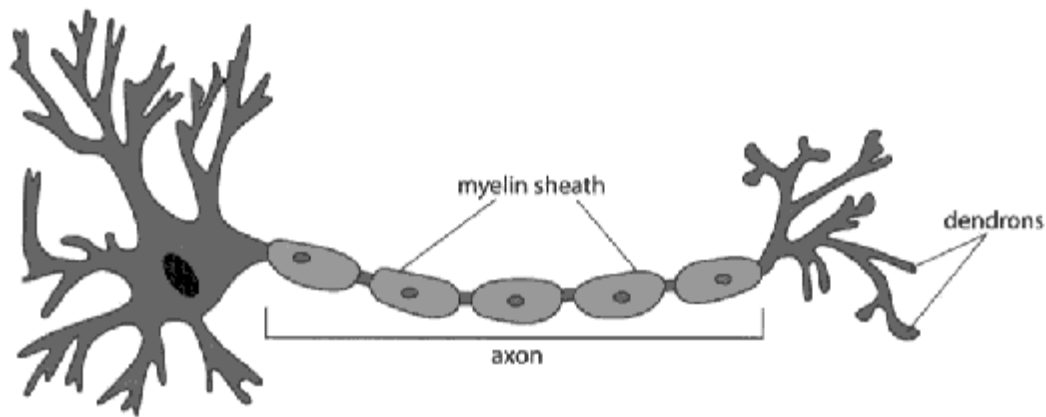
4 separate structures were accessible to candidates.

A limited explanation of just one structure (usually either myelin sheath or axon transmission) that was conveyed in a simple yet efficient way was awarded Level 1 (2 marks).

A simple explanation of how two structures function, with keen grammatical sense and efficient communication, was awarded 4 marks (Level 2).

A detailed explanation of how three structures relate to the motor neurone function, conveyed in a coherent manner with keen attention to details of spelling and grammar, was awarded the full 6 marks (Level 3).

* (c) The diagram shows the structure of a motor neurone.



Explain how the structure of the motor neurone relates to its function in carrying messages through the nervous system.

(6)

Because at the top of the motor neurone you have dendrites which connects to the neurone before that, but in between is a synapse which sends the electrical impulse across to the motor neurone, which then goes through the axons. The myelin sheath is there to protect and stop the electrical impulse from escaping, after the electrical impulse has been passed through it sends it to the dendrons at the end of the neurone, which then passes the impulse to the effector, which then sends it to respond.

(Total for Question 6 = 12 marks)

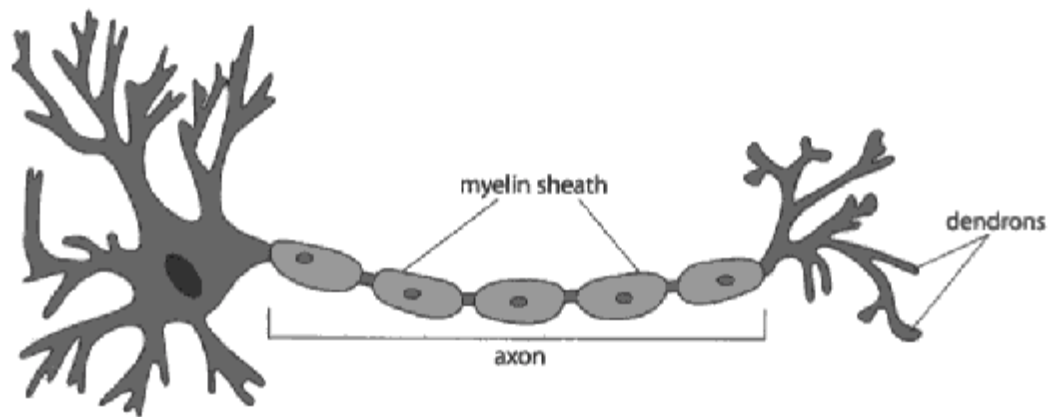


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This candidate has scored the maximum 6 marks as they have conveyed their ideas in a very suitable manner, with excellent handwriting ability, good communication style and flawless spelling and grammatical skills. They have commented on the function of all areas of the motor neurone up to and including the effector connection.

This is an excellent example of a 6-mark-style answer.

*(c) The diagram shows the structure of a motor neurone.



Explain how the structure of the motor neurone relates to its function in carrying messages through the nervous system.

(6)
The dendron carry it ~~to~~ through the myelin sheath and a chain of them is called axon and then they send it ~~to~~ through to the other side of the motor neurone and it ~~to~~ will carry on like that until it get to the brain very quickly then you make that action.

(Total for Question 6 = 12 marks)



ResultsPlus
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This candidate has managed to secure 2 marks for the reference to the use of the axon (the most popular answer when 2 marks were awarded). Unfortunately, other comments are either incorrect or too muddled to provide adequate marking opportunities. The level of communication is only just adequate for the award of 2 marks in the Level 1 band.

Summary

Based on their performance on this paper, candidates are offered the following advice:

- Ensure that written answers are as concise as possible yet include all of the information that is to be marked. Writing more does not always guarantee high marks.
- Read the question very carefully; ensure that what is being asked is the essence of your answer. Have you explained your answer to a question that begins with the command word 'Explain'?
- The answers that are written must be legible. A correct answer that cannot be read at all will be marked as an incorrect answer, unfortunately.
- Using biological terminology will always gain more credit than non-specific words. For example, use 'homeothermic' rather than 'warm-blooded'; write 'cirrhosis' rather than 'liver disease'.
- Ensure that the 6-mark-style questions are written coherently and with a logical flow and order of points. There are marks awarded for Quality of Written Communication. This means that examiners will be awarding marks for the correct spelling of biologically significant words, the correct use of grammar and how easy the longer-style answer is to read and mark.

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