ResultsPlus

edexcel

Examiners' Report
June 2015

GCE Biography 6BI04 01

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk.

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

ResultsPlus

Giving you insight to inform next steps

ResultsPlus is Pearson's free online service giving instant and detailed analysis of your students' exam results.

- See students' scores for every exam question.
- Understand how your students' performance compares with class and national averages.
- Identify potential topics, skills and types of question where students may need to develop their learning further.

For more information on ResultsPlus, or to log in, visit www.edexcel.com/resultsplus.
Your exams officer will be able to set up your ResultsPlus account in minutes via Edexcel Online.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. 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 our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk.

June 2015

Publications Code UA040919

All the material in this publication is copyright
© Pearson Education Ltd 2015

Introduction

All questions were attempted by the majority of candidates; very few blank responses were seen. There were some good quality responses and all the mark points were seen.

The multiple choice questions performed reasonably well. Candidates were torn between B and C for 2(c) but were alright if they read the question carefully. Question 2(e) caused few problems. Question 4(b) scored reasonably well. The two multiple choice questions in the last section of the paper were probably the most challenging, however it was refreshing to see that a number of candidates gained both marks.

Question 1 (a) (i)

The majority of candidates could describe the role of the skin flora. However, marks were lost by candidates whose responses were simply too ambiguous. For example a number of candidates did not state what was being competed for or used vague terms such as resources or food. The less successful candidates thought that the flora produced lysozyme.

Question 1 (b) (ii)

Responses to this question were a little disappointing as it was a very straightforward recall question about AS content.

(ii) The primary structure of a protein is important in determining its final structure and properties.

Describe the structure and properties of fibrous proteins.

(4)

Straight chain polypetides
made up of many ~~monomer~~ amino acids held together by peptide links
insoluble, as hydrophobic R-group face ~~out words~~ out words ~~*~~ and hydrophilic R-groups face inwards.
chains are held together by cross-links adding strength
are strong and are used for structural nusses with the body. for example muscles and tendons.
known as structural proteins

ResultsPlus
Examiner Comments

This was one of the more successful responses that we saw; it was awarded mark points 2, 5, 3 and 6. The responses is succinct and covers both aspects of the question.

ResultsPlus
Examiner Tip

To gain full marks a question must be fully answered. This question asked about both structure and properties so both of these had to be addressed for all four marks to be accessed.

(ii) The primary structure of a protein is important in determining its final structure and properties.

Describe the structure and properties of fibrous proteins.

(4)

- Linear
- Long
- Soluble
- "Criss cross" structure
- Strong

ResultsPlus
Examiner Comments

Although we will accept bullet points, single words are rarely acceptable and should be avoided. This is just a list of characteristics but as it can only refer to the fibrous proteins we could award mark point 6.

ResultsPlus
Examiner Tip

Short succinct sentences (bullet points) are acceptable provided that there is enough wording for context. Just a list like this is risky as there is insufficient wording for context.

Question 1 (b) (iii)

This question was poorly done as candidates did not read the question properly and simply described the processes of transcription and translation. Although many of the descriptions were very detailed and accurate, this is an A2 paper and candidates have to write responses that address the question. Very few candidates appeared to appreciate the significance of transcription.

(iii) Describe the roles of the template (antisense) DNA strand and mRNA in determining the primary structure of a protein.

(4)

The template strand codes for the mRNA (tense strand) in ~~st~~ transcription, which leaves the nucleus into the cytoplasm to join a ribosome. The information is the translated using tRNA to make a polypeptide chain consisting of amino acid (primary structure) So the template strand codes for the sequence of amino acids that will make up the structure. The mRNA has a codon (triplet base) which complementary base pairs with an anticodon on a tRNA, which also has an amino acid attached. Adjacent amino acids join by peptide bonds to make the primary structure.

(Total for Question 1 = 12 marks)

ResultsPlus
Examiner Comments

This is an example of a response where the candidate has at least tried to select the appropriate information. However they have only picked up mark points 2 and 5.

ResultsPlus
Examiner Tip

Read the question very carefully and then select the information that you need. You do not have time to write everything that you know for every question.

(iii) Describe the roles of the template (antisense) DNA strand and mRNA in determining the primary structure of a protein.

(4)

*Antisense strand has a sequence of bases that codes for the sequence of ~~amino~~ amino acids.
*tRNA carries amino acids to ribosome.
*mRNA joins to ribosomes, ~~tRNA~~ tRNA has anti codons that join to mRNA's codons.
* Peptide bonds between amino acids form.
* The primary structure of a protein is the sequence of amino acids in a polypeptide

ResultsPlus
Examiner Comments

This response is just a list of statements about the process; this information needs rewriting to shift the emphasis to answer the question. Only mark point 1 awarded.

Question 2 (a)

Both mark points 1 and 2 were seen frequently, however not often together. Very few candidates were awarded mark point 3 as they failed to include A2 level detail in their answers.

(a) Explain how carbon dioxide is removed from the air into the oceans by process A.

(2)

Carbon dioxide is removed by photosynthesis by plants eg. algae growing in the ocean. Plants will cause carbon fixation by the light independent (calvin cycle) reaction.

ResultsPlus
Examiner Comments

This response does demonstrate both mark points 2 and 3.

ResultsPlus
Examiner Tip

Remember to include the appropriate level of detail in your response. You knew that plants use carbon dioxide for photosynthesis in year 8 or 9 so you are not going to get many marks for this level of detail on an A2 paper. You did not know about carbon fixation before you studied this course, so this is the detail needed.

(a) Explain how carbon dioxide is removed from the air into the oceans by process A.

(2)

Carbon dioxide dissolves in oceans acidifying the oceans.

ResultsPlus
Examiner Comments

This is a typical response demonstrating mark point 1.

ResultsPlus
Examiner Tip

You are not going to get 2 marks for one statement. Always check the mark allocation to ensure that you write down enough facts.

Question 2 (b)

This question was answered well by most candidates.

Question 2 (d)

We saw some clear responses to this question, with many gaining all 3 marks. Some of the less successful candidates either failed to link respiration in with the release of carbon dioxide, or else referred to the release of carbon.

(d) Describe the role of bacteria in process D in the diagram.

(3)

When plants die in forests, bacteria secrete enzymes that break down the cellulose in plant cell walls by hydrolysis of the 1,4-glycosidic bonds, forming glucose monomers that are taken in by bacteria for respiration, releasing CO_2 into the air as a product of respiration.

ResultsPlus
Examiner Comments

This example demonstrates the quality of a number of the responses that we saw to this question. All 3 marks were awarded.

Question 2 (f) (i)

This was a very straightforward calculation that caused very few candidates a problem.

Question 2 (f) (ii)

Candidates are clearly aware that burning fossil fuels releases carbon dioxide from the carbon that has been stored for years. Many also know that deforestation is going to reduce the carbon dioxide being removed from the air. Disappointingly, very few candidates actually answered the question; we rarely saw mark point 1.

Marks tended to be lost because candidates were referring to carbon when they should have been writing carbon dioxide and *vice versa.* For example, we had trees storing carbon dioxide and we had a reduction in the number of plants absorbing carbon for photosynthesis.

(ii) Suggest why more carbon is entering the air than is leaving it.

(3)

Because Fossil fuels are carbon sinks that hold carbon and have collected it over millions of years so when fossil fuels are burnt, a lot of carbon dioxide is released very quickly in comparison to how long the it's taken for the fossil fuels to form. ~~Bow~~ ~~Eo~~ ~~Ross~~ For the same amount of fossil fuel burned, at one time it would take millions of more years for ~~the~~ the same amount of fossil fuel to reform.

ResultsPlus
Examiner Comments

This response illustrates mark points 2 and 3 clearly but the candidate has only focussed on one aspect so does not access all the marks.

(ii) Suggest why more carbon is entering the air than is leaving it.

(3)

There are more processes that result in carbon entering into the air compared to carbon leaving the air. In this case, there is one more process of carbon entering ~~that~~ into the air than leaving it.

Despite the ~~two~~ ~~processes~~ process ~~with the~~ ~~(land~~ E~~)~~ ~~which~~ removing carbon being the greatest ~~mass~~, there ~~are~~ is a greater accumulation from different sources that leads to more carbon entering the air.

ResultsPlus
Examiner Comments

This response illustrates a mistake that was common amongst the less successful candidates: they looked at the diagram and talked about the number of processes instead of the contributions. This response also demonstrates the use of the word carbon when it should be carbon dioxide.

Question 3 (a) (i)

This question was based on a unit 2 core practical so should not have caused candidates too many problems. The majority of candidates ploughed straight into their response and described the function of the ions listed on the unit 2 specification. Very few candidates picked up the fact that they were being asked about optimum growth and that all the required ions would have to be present at appropriate concentrations, which was disappointing. There were a surprisingly large number of candidates who thought that carbon dioxide and glucose should be in the solution as well.

(i) Explain what the solution should contain for the optimum growth of duckweed.

(3)

The solution should contain a number of inorganic ions such as nitrates, calcium, magnesium and phosphates. Nitrates will be absorbed to produce proteins and help the plant to grow, calcium and magnesium are used also for growth and pigmentation for photosynthesis. Phosphates will be used by the duckweed to help resynthesise ATP, be used in lipid production and also as ~~part~~ a key part of Chlorophyll A in photosystem ~~II~~ II for the light dependent stage of photosynthesis

ResultsPlus

Examiner Comments

This is a good example of one of the more successful responses that we saw, scoring 3 marks: mark point 1 and then 2 marks for the named examples.

(i) Explain what the solution should contain for the optimum growth of duckweed.

(3)

Nitrogen for protein synthesis and nitrogenous bases.
Magnesium for photosynthesis to occur in leaves and for production of chlorophyll
Calcium for strong cell walls
Phosphorus for ~~nucleic acid~~ new ATP

ResultsPlus
Examiner Comments

Despite commenting on this every year, we still had a significant number of candidates referring to named elements and not ions. These cannot be credited at this level.

ResultsPlus
Examiner Tip

There is a difference between an element and an ion. Magnesium is not the same as a magnesium ion, for example. At this level, we expect basic chemistry to be correct. Always read through your answer carefully to make sure that you have not made this mistake.

Question 3 (a) (ii)

The majority of candidates could state that a line of best fit should be drawn but very few went on to say how it would be used once draw

(ii) Explain how the information in this graph could be used to estimate the increase in growth after a further six days.

(2)

• Could draw a line of best fit and extrapolate

• Draw a horizontal line across from where line of best fit reaches 6 days, to the number of duckweed fronds

• Then, to work out increase, subtract initial growth from final growth after further 6 days

ResultsPlus
Examiner Comments

This response demonstrates all 3 mark points.

(ii) Explain how the information in this graph could be used to estimate the increase in growth after a further six days.

(2)

A smooth line of best fit could be drawn on the ~~extreme~~ graph and the data extrapolated. It would be assumed that current trends continue and so the growth after a further 6 days can be estimated.

ResultsPlus
Examiner Comments

This is an example of a much more typical response, only gaining mark point 1.

ResultsPlus
Examiner Tip

Always check the mark allocation for a question as this will guide you to the expected level of detail needed in your answer.

Question 3 (b)

On the whole this question was answered extremely well with a large number of responses being awarded full marks. Even the less successful candidates were picking up about 3 marks for their answers.

*(b) Describe an experiment that could be carried out to investigate the effect of temperature on the growth of duckweed.

(5)

Seven ~~3~~ beakers of ion solution could be prepared, each with four duckweed plants in. All the beakers must be the same with the same amount of water in, 100cm^3 and the same number of duckweed plants and same ion concentrations. It is important to control these extraneous variables to ensure the results are valid. Each of the beakers can be incubated at different temperatures. At 5°C, 10°C, 15°C, 20°C, 25°C, 30°C and 35°C. The beakers are all then left ~~for~~ incubated and the number of fronds on the duckweed plants measured at the same time each day. After six days, the beakers can be taken out of incubation and means calculated for each day for each temperature from the measurements from the four plants. A control beaker with four duckweed plants can be grown at room temperature and the results recorded.

(Total for Question 3 = 10 marks)

ResultsPlus
Examiner Comments

This is a typical response, scoring mark points 1, 6, 2, 5, 4 and 7.

ResultsPlus
Examiner Tip

Room temperature is not a suitable stated temperature as it could be a number of different values and cannot be controlled. If you mean 20°C, then state the value.

Not applicable to this response but the range of values has to be sensible. For example this investigation could not be carried out at 0°C so mark point 2 could not be awarded.

Question 4 (a) (i)

Candidates have been asked about phagocytosis in a number of previous papers so we saw lots of answers that scored 2 marks. However, candidates clearly do not appreciate when phagocytosis ends; many responses included details of what happens to the pathogen once it is inside the phagosome.

4 Phagocytosis is a non-specific response of the body to infection.

(a) Explain the meaning of each of the following terms.

(i) Phagocytosis

(2)

Phagocytosis is when a phagocyte ~~with recepto~~ recognises a pathogen as non-self and so engulfs the pathogen. The pathogen ~~in~~ is within a vacuole in the phagocyte and digestive enzymes, lysozymes, are released into the vacuole. These kill the pathogen.

ResultsPlus
Examiner Comments

This is an example of a typical response.

ResultsPlus
Examiner Tip

The phagocyte has to bind to the pathogen before it can be engulfed; this binding is enhanced by antibodies (opsonisation) once the immune response has been initiated.

Question 4 (a) (ii)

This question did cause problems as it is part of the specification that has not been tested in this format before. Candidates clearly understood what the term meant but they could not express themselves accurately enough to gain the marks.

(ii) Non-specific response

(2)

A non-specific response is an immediate response to any pathogen which is recognised as non-self. It is not specific to any pathogen.

ResultsPlus
Examiner Comments

This response is one of the clearer ones that we saw, gaining mark points 1 and 2.

(ii) Non-specific response

(2)

A Non-specific response is the general immune response of white blood cells and enzymes to fight foreign pathogens in the body. For example, lysozymes, are an enzyme which break down foreign ~~pa~~ pathogens. The inflammatory response, involves white blood cells, and their release of chemicals (chemotaxis) to fight invading pathogens.

ResultsPlus
Examiner Comments

This response is more typical of the responses that we did see, with lots of confusion over the word immune.

Many candidates were only awarded mark point 3 for an appropriate example.

ResultsPlus
Examiner Tip

We have a non-specific response and an immune response, we do not have a non-specific immune response. This is a contradiction of terms.

Question 4 (a) (iii)

(iii) Infection

(2)

When pathogen enters body cells, replicating and causing the lysis of the body cells leading to symptoms of disease.

ResultsPlus
Examiner Comments

This candidate was awarded both mark points.

ResultsPlus
Examiner Tip

You are expected to be able to give the meaning of any of the terms used in the specification. It is a good idea to build up a glossary of terms as you work your way through the course and then learn them for the exam.

(iii) Infection

(2)

when a foreign body (e.g. virus) infects host's cells and reproduces, therefore infecting more cells.

ResultsPlus
Examiner Comments

Some candidates tried to give a 2 mark definition, as in this response, but failed to use appropriate alternative terms.

ResultsPlus
Examiner Tip

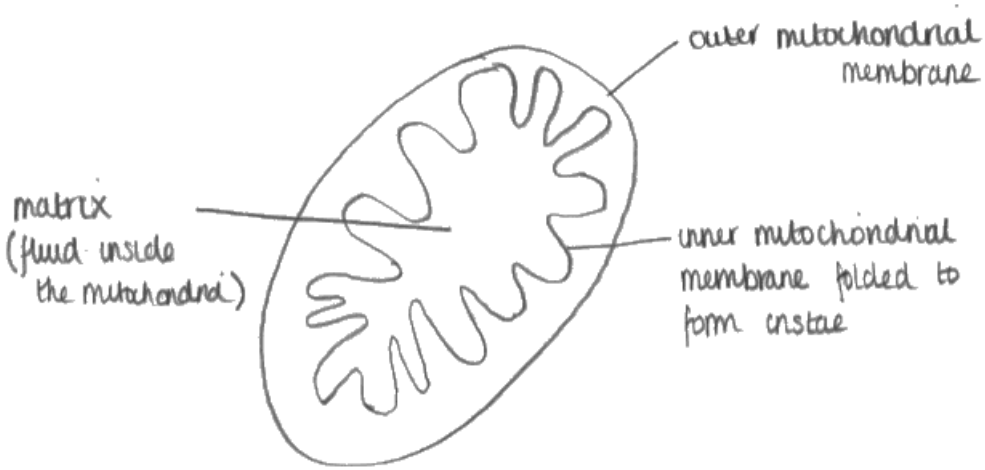
Do not use the word you are defining in your definition.

Question 4 (c) (i)

(c) ATP is synthesised in mitochondria.

(i) In the space below, draw and label a diagram to show the structure of a mitochondrion.

(4)



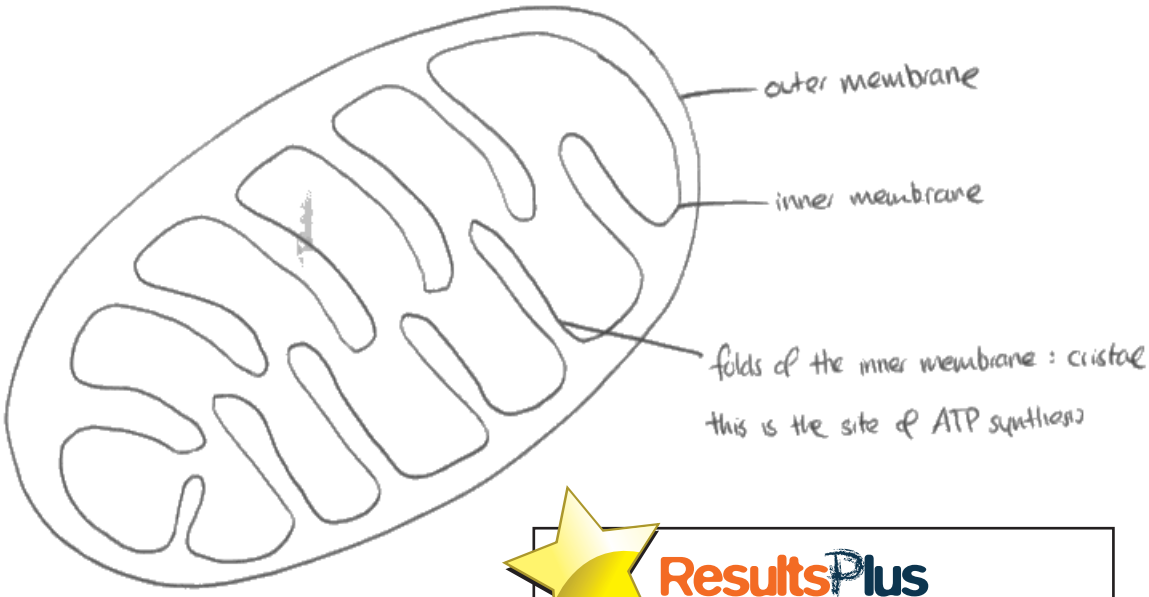
ResultsPlus
Examiner Comments

This diagram illustrates all that was necessary to gain all 4 marks. We wanted to see two membranes with the inner one folded and two correct labels.

(c) ATP is synthesised in mitochondria.

(i) In the space below, draw and label a diagram to show the structure of a mitochondrion.

(4)



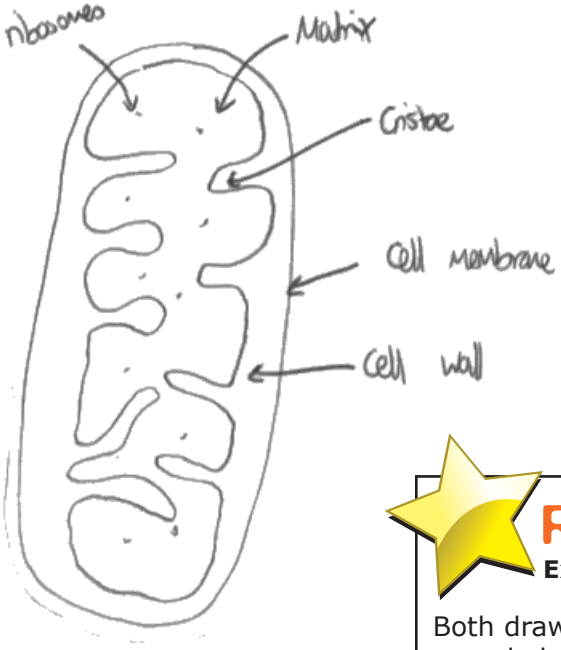
ResultsPlus
Examiner Comments

This mitochondria has been drawn more accurately but only gets 3 marks as they have only labelled membranes.

(c) ATP is synthesised in mitochondria.

(i) In the space below, draw and label a diagram to show the structure of a mitochondrion.

(4)



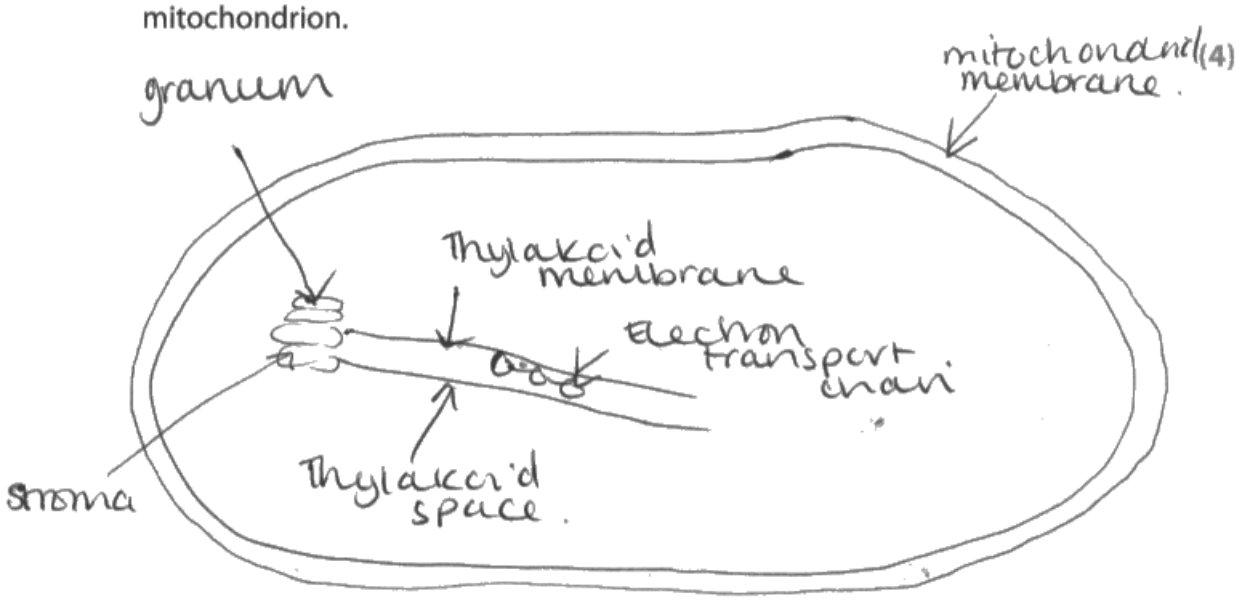
ResultsPlus
Examiner Comments

Both drawing marks have been awarded. None of the label marks can be awarded as both cell membrane and cell wall are wrong and we cannot select the right answers from the wrong ones.

(c) ATP is synthesised in mitochondria.

(i) In the space below, draw and label a diagram to show the structure of a mitochondrion.

(4)



ResultsPlus
Examiner Comments

We were quite taken-aback by the number of chloroplast drawings that we saw, such as the one illustrated here.

ResultsPlus
Examiner Tip

You need to revise all the unit 1 and unit 2 topics, not just the ones that directly relate to a unit 4 topic.

Question 5 (a)

A whole range of responses were seen for this question. The majority of candidates wrote about the effect of the infection on the lung but there were a number of candidates that wrote down everything they knew including a description of the slime capsule and antibiotic therapy and resistance. The more successful candidates attempted to link the damage caused by the infection with the individual symptoms but few were specific enough to be awarded mark point 5.

Using the information in the photograph and your knowledge of gas exchange surfaces, suggest why this infection can result in these symptoms.

(4)

tubercles will reduce the area of the lungs available for gas exchange meaning that breathing will become difficut because of the alveoli covered by tubercles.
The tubercles will imtate the lungs leading to coughing up blood and a persistant cough.
the blood would be a result of the tubercle ~~being~~ ~~[illegible]~~ ~~[illegible]~~ inflammation because of the coughing which would cause bleeding.

ResultsPlus
Examiner Comments

This response illustrates mark points 1, 3 and 2. Mark point 5 was not awarded as we needed something about damage to the capillaries.

Using the information in the photograph and your knowledge of gas exchange surfaces, suggest why this infection can result in these symptoms.

(4)

~~The presence of the tubercle~~. The infection has resulted in the death of some lung tissue. This decreases the number of alveoli in the lung, thus decreasing surface area for gas exchange. The body still requires the same amounts of oxygen, therefore breathing rate will increase to compensate for less surface area of gas exchange. The infected person will cough as a result of a reflex to rid the lungs of the tuberculo.

ResultsPlus

Examiner Comments

This response illustrates 4 out of 5 of our mark points. No attempt has been made at explaining the presence of blood in the coughed up mucus.

Question 5 (b) (i)

The graph in this question was presenting quite a lot data. The candidates who read the question properly generally scored 2 out of 3 marks, failing to score full marks as they just did not make enough statements. Unfortunately too many candidates assumed what the question was asking and described the change in resistance to each antibiotic between the years, in fact making the question more complicated than it actually was.

(i) Using the information in the graph, compare the types of antibiotics and combinations of antibiotics that the *Mycobacterium tuberculosis* are resistant to in 2006 with 2007.

(3)

In both years, the bacteria are resistant to INH, INH + Rifampicin, Ethanbutol and Streptomycin. However, in 2007, the bacteria is also resistant to Rifampicin and ethanbutol

In both years, the bacteria are resistant to INH, ~~INH + Rifampicin~~, INH + Rifampicin + Ethanbutol and Streptomycin. However, in 2007, the bacteria become resistant to Rifampicin and ethanbutol. However, it is no longer resistant to the combination of INH + Rifampicin.

ResultsPlus
Examiner Comments

This is a good clear response that scores 3 marks, mark points 2, 4 and 3.

ResultsPlus
Examiner Tip

Read every word in the question - do not pick out a few key words and invent your own question.

Make sure that you make at least as many points as there are marks allocated to the question.

(i) Using the information in the graph, compare the types of antibiotics and combinations of antibiotics that the *Mycobacterium tuberculosis* are resistant to in 2006 with 2007.

(3)

There is a general increase in resistance agains INH and INH+Rifampicin with time.
There are very slight changes (almost constant) in resistance agains Streptomycin and INH + Rifampicin + Ethanbutol.
There is a general decrease in resistance against Rifampicin and Ethanbutol.
The highest resistance against strepto mycin and INH.

ResultsPlus
Examiner Comments

This response is at the other end of the spectrum and is typical of candidates who had not read the question properly.

Question 5 (b) (ii)

It was pleasing how many candidates attempted to answer this question given it was set in a slightly different context. As in previous papers the same mistakes were made. There was confusion between the terms alleles and genes and the response did not refer specifically to the context of the question.

(ii) The percentage of strains of *Mycobacterium tuberculosis* resistant to the antibiotic INH has increased during these three years.

Suggest how natural selection could have resulted in this increase.

(3)

The antibiotic acted as a selection pressure. There would have been random mutations in the bacterial DNA that gave them a survival advantage such as being able to reproduce more rapidly). This allele meant they were more likely to survive and reproduce and pass this on to their offspring. Over time the frequence of this allele in the population increased. Also, conjugation (horizontal evolution) could contribute to this by passing advantageous alleles between cells.

ResultsPlus
Examiner Comments

This response is of very high quality and scored all but one of our mark points, mark point 6. This last mark point was rarely seen.

ResultsPlus
Examiner Tip

This candidate has explained natural selection using the context of the question to expand on the statement; this is essential at A2. They have also written more facts than there are marks allocated to the question, without writing a load of irrelevance; this can be advisable to ensure that full marks are achieved.

(ii) The percentage of strains of *Mycobacterium tuberculosis* resistant to the antibiotic INH has increased during these three years.

Suggest how natural selection could have resulted in this increase.

(3)

A genetic mutation in one of the mycobacterium tuberculosis cells may have ~~been a drawbacks to~~ put the bacterium at an advantage when exposed to the INH selection pressure. This would have made the bacterium more likely to survive over other bacteria without this mutation. Over the years the bacterium can replicate to pass the alleles onto further copies of the cell. There is an increase in allele frequency in the gene pool for resistance therefore the % of resistant strains to INH increases as more and more bacteria become more adapted.

ResultsPlus
Examiner Comments

Another good example to illustrate our mark scheme.

(ii) The percentage of strains of *Mycobacterium tuberculosis* resistant to the antibiotic INH has increased during these three years.

Suggest how natural selection could have resulted in this increase.

(3)

The use of INH creates a selection pressure in MT strains. This means that natural mutations making some MT resistant to INH, this become selective advantage as it means this bacteria are more likely to survive and reproduce, passing on the resistant gene to the next generation (vertical evolu whilst those without the mutation die out. Over 3 years this means the frequency of resistance to INH would increase.

ResultsPlus
Examiner Comments

Although this candidate understands the concept of natural selection the clarity of the response and the level of detail is insufficient.

ResultsPlus
Examiner Tip

Always state that a mutation occurs in the DNA and remember that it is the alleles that are important.

Question 5 (b) (iii)

Candidates were relieved to see a question on this more familiar part of the specification. Unfortunately some were too quick to answer the question and did not appreciate that we were focussing specifically on preventing the spread of antibiotic resistance, so we got lots of references to changing pillows regularly and washing the bedding between patients.

(iii) Suggest how hospitals could prevent an increase in the percentage of strains of *Mycobacterium tuberculosis* resistant to antibiotics.

(2)

- Codes of conduct regarding antibiotic prescription i.e only prescribe for ~~specific~~ bacterial infection not for prophilactics or virals.
Only use antibiotics once specific strain detected and use antibiotics on rotation bases. Until specific strain detected use wide spetrum
Advice finishing course of antibiotics.

ResultsPlus
Examiner Comments

This response illustrates all our mark points.

ResultsPlus
Examiner Tip

Giving a cocktail of antibiotics will not help to reduce the spread of antibiotic resistance, in fact it will help to increase it.

Question 6 (a)

Another question assessing a familiar part of the specification but again many candidates rushed their response without considering what the third mark could be for. Mark points 1 and 2 were frequently awarded but a more lateral approach was rarely seen.

(a) Explain why the ambient temperature and the core temperature of the body are used to determine the time of death of a person.

(3)

When a body is dead, the core body temperature cools, this can be used to estimate how long the body has been dead. However the rate at which the body cools is dependent on the ambient temperature – the temperature of the air surrounding the body. If the ambient temperature is hotter, the body will not cool as quickly. Therefore, both of these temperatures should be recorded.

ResultsPlus
Examiner Comments

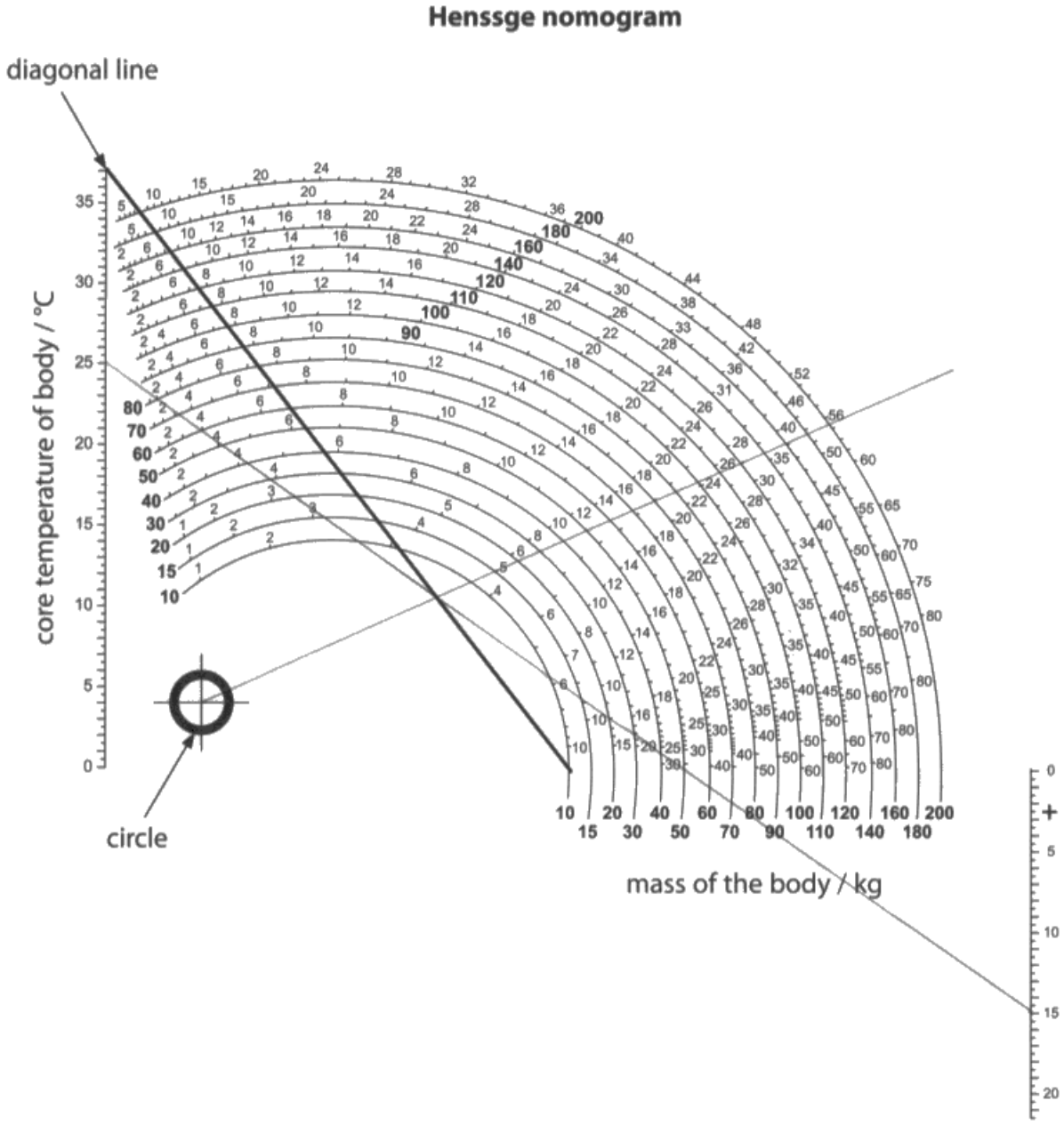
A typical response scoring 2 marks.

ResultsPlus
Examiner Tip

Do not forget that ambient temperature not only affects the change in temperature of the body but also the rate of decomposition and rigor and the duration of insect life cycles.

Question 6 (b) (i)

This novel approach to testing this part of the specification saw a range of responses. Many candidates scored all 3 marks; they read the instructions and followed them by drawing accurate lines. Some candidates followed the instructions but did not take sufficient care in their line drawing so lost a mark for not being close enough to the actual answer. Some candidates just drew the first line and gained 1 mark. We did see blank responses however.



(i) A body was found. The mass of the body was 100 kg and the core temperature of the body was 25 °C. The ambient temperature was 15 °C.

Use the Henssge nomogram to estimate the time of death.

(3)

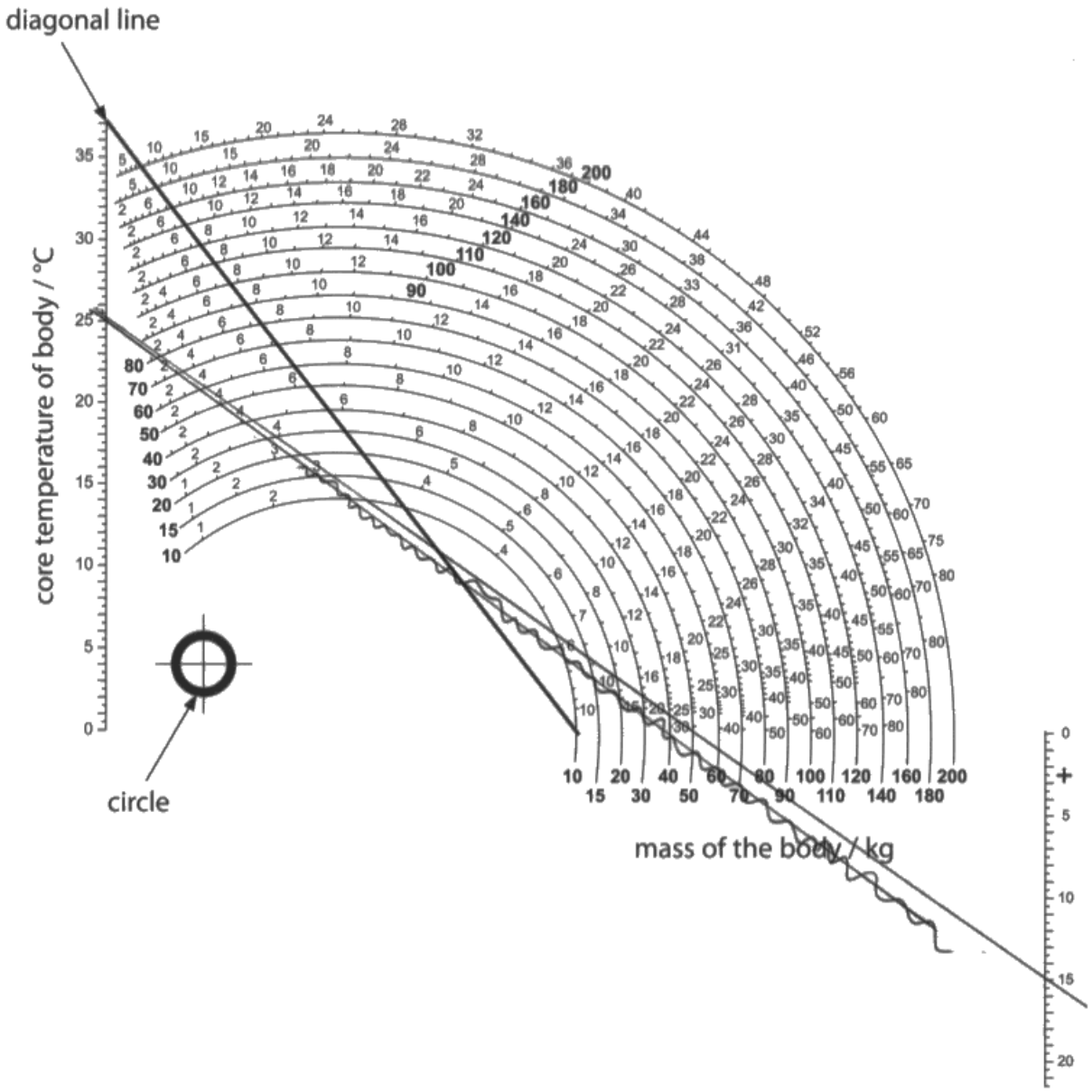
ResultsPlus
Examiner Comments

Carefully drawn lines which yielded an answer within our tolerance range.

ResultsPlus
Examiner Tip

Care should be taken when drawing diagrams or reading values off graphs.

Henssge nomogram



(i) A body was found. The mass of the body was 100 kg and the core temperature of the body was 25 °C. The ambient temperature was 15 °C.

Use the Henssge nomogram to estimate the time of death.

(3)

What even is this?

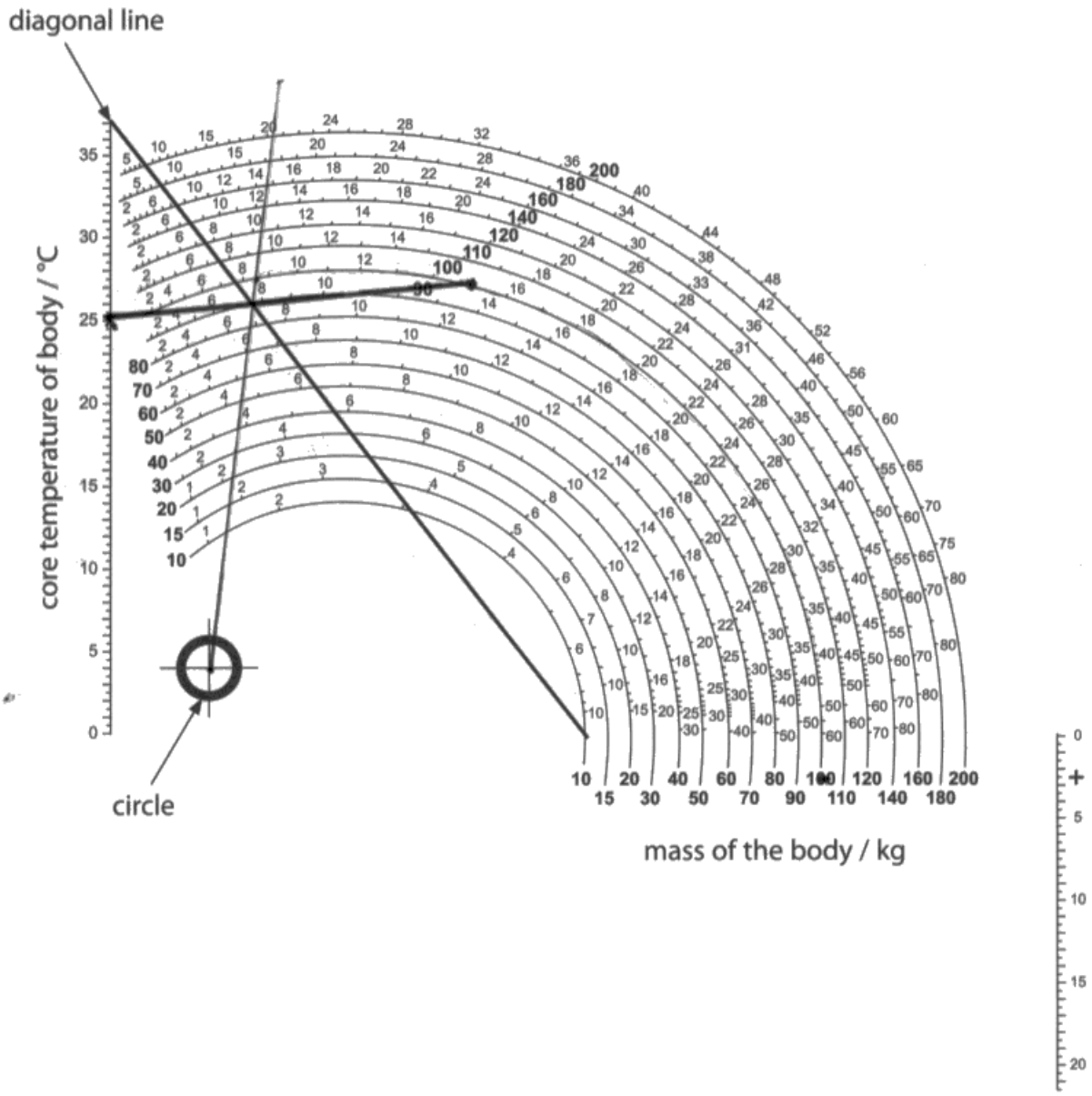
ResultsPlus
Examiner Comments

It is clear that this candidate had never seen anything like this before. However their attempt at the question yielded them 1 mark.

ResultsPlus
Examiner Tip

Always attempt a question. You are guaranteed a mark of zero if you leave a blank but you may pick up odd marks if you make an attempt at it. This candidate did what they could and got 1 mark - this 1 mark could make the difference of a grade.

Henssge nomogram



(i) A body was found. The mass of the body was 100 kg and the core temperature of the body was 25 °C. The ambient temperature was 15 °C.

Use the Henssge nomogram to estimate the time of death.

(3)

ResultsPlus
Examiner Comments

This candidate has not followed the instructions properly for the line drawing marks. However the value read from the graph for their lines is correct. 1 mark can be awarded.

ResultsPlus
Examiner Tip

Another example of where attempting a question is better than leaving a blank. Always attempt the question and never leave blanks.

Question 6 (b) (ii)

The majority of candidates had a really good attempt at this question and the full range of marks was seen. Only the more able candidates attempted to state what would happen to the estimated time of death, but even some of these got confused with whether the effect would result in an over estimate, or an under estimate. Some tried to say how the time since death would be affected but again got confused.

*(ii) The Henssge nomogram is used to estimate the time of death of a naked body, lying stretched out and in still air.

Suggest how a change in each of these three factors could affect the estimated time of death. Give reasons for your answer.

(6)

Firstly, if the body has clothes on (not naked) the clothes will insulate the body to prevent heat loss via radiation to the environment. The thicker and/or more clothes the person is wearing the less heat will be lost and so the body ~~will~~ may have been dead longer than the nomogram suggests because the body temperature is higher than a naked body.

If the body was killed and is then curled up and not stretched out fully there is less surface area for heat to escape from, therefore ~~increasi~~ when the body is found less heat than the nomogram body would have been lost so again time of death may be shown as more recent than it actually was.

Lastly, if the body is outside and it's windy, not still air, the constant air flow will replace air near the body more rapidly and so drawing heat energy away from it more quickly, cooling it faster. This extra cooling may show up on the nomogram that the body ~~dead~~ has been dead for longer than it actually has.

ResultsPlus
Examiner Tip

Use the structure of the question to help you structure your response. You are asked about three factors and their effect on the estimated time of death and you are asked to give reasons. You therefore need three sections to your answer. Each section should comment on the estimate and each section should give a reason why.

Look carefully at how this response has been structured.

ResultsPlus
Examiner Comments

This is an example of a really good response that illustrates all of our mark points.

Question 7 (a)

We have had loads of questions in the past on global warming but not many have asked for a definition of the term. Many candidates word spotted and went into lengthy explanations of how global warming is caused. Those who did try and state the meaning made the common mistake of not being precise about what is increasing in temperature, i.e. just wrote an increase in temperature of the earth. Quite a number omitted to state that the increase in temperature was actually an increase in the average temperature. Others referred to the warming of the earth which is not going far enough beyond the stem of the question.

(a) Explain the meaning of the term **global warming**.

(2)

The increase in mean global surface temperatures over a long period of time. This does not include fluctuations in temperature due to seasons.

ResultsPlus
Examiner Comments

This is the sort of definition that we were looking for, although we would have preferred earth's surface to global surface.

Question 7 (b) (i)

Candidates had a reasonable attempt at this question but few scored the full 4 marks, usually because they did not make a sufficient number of statements. Most responses discussed the effect of temperature on enzyme activity and the subsequent effect of killing the plants, for 2 marks. We saw a large number of responses that referred to migrating plants, which we were not prepared to accept; candidates need to think carefully about some of the words that they choose to use.

(b) (i) Describe and explain how global warming could affect plant species.

(4)

Global warming may affect the abundance of plant species. For example an increased temperature increases enzyme activity by increasing kinetic energy. Hence more collisions occur and more enzyme substrate complexes are formed. This increase the rate of metabolic reactions which could cause plant species to go through their life cycle faster. Also, it may affect the distribution of plant species. Plants may become extinct in certain areas due to increased temperatures which have surpassed what is needed for their niche. Changing seasonal cycles can also affect plants.

ResultsPlus
Examiner Comments

A good response illustrating mark points 3, 6, 2, 1 and 5.

ResultsPlus
Examiner Tip

Again, use the structure of the question to help structure your answer. There are two command words and 4 marks. You need at least two descriptions, each with an explanation to even get close to being awarded full marks.

(b) (i) Describe and explain how global warming could affect plant species.

(4)

Global warming could make plants grow better as ~~it is~~ ~~the~~ as ~~tig~~ temperature increases, so will light intensity, allowing for a faster rate of photosynthesis. However, temperatures may rise and drought could become an issue. This would make water availability a limiting factor, meaning many plant species may die. As temperature rises too high, enzymes denature, therefore plants wont be able to survive as enzyme's active sites have changed shape and molecules wont be able to fit.

Question 7bi_2149527_01.png

ResultsPlus
Examiner Comments

This response illustrates some of our other points. This was awarded mark points 3, 4, 1 and 6.

Question 7 (b) (ii)

Candidates tended to pick up the first mark point but only the middle to higher ability candidates appreciated that they needed to think more broadly if they were going to score the full 3 marks

(ii) Explain how the effects on plant species could affect animal species.

(3)

The food chains and webs will be affected. If some plant species become extinct, some species of animals will struggle to find food. Diets of some animals could change which could eventually lead to speciation. Some animals may have to migrate North where there is a greater abundance of a particular plant that they eat. Some ~~animal~~ insects could become extinct as they have no food. This will mean a lack of food for their predators also.

ResultsPlus
Examiner Comments

This response was awarded mark point 3 and 1. However mark point 1 could only be awarded at the end. It was a common mistake candidates stating that the animals would struggle to find food without actually stating what the resulting effect would be.

ResultsPlus
Examiner Tip

Read through your answers very carefully. Just because a question appears easy, it does not mean that the answer will be that straightforward.

(ii) Explain how the effects on plant species could affect animal species.

(3)

If a plant species ~~is~~ becomes extinct, the animals which rely on the plant for food will lose their food source, which may cause them to become extinct, or dramatically reduce in number. Then the animals which rely on the animals which eat plants to survive (herbivores) no longer have a food source. Also, if the plants move to a new area where the conditions are favourable, the animals also have to move, this could create a new species or cause a species extinction.

ResultsPlus
Examiner Comments

Mark point 1 and 3 again. This candidate has attempted mark point 2 but their answer does not go far enough.

Question 7 (c)

We have not really assessed this specification point in the past so we were pleased how well candidates did on this question. Again, it was evident that some candidates had word-spotted and as a result churned out a description of how global warming is caused. Others did not use the mark allocation to guide them into making sufficient suggestions.

(c) This survey shows that 61% thought future generations of people could be harmed by global warming.

Suggest why the rest of the people surveyed thought that future generations of people would **not** be harmed by global warming.

(3)

* Models predicting future climate change may be inaccurate as merely on the assumption that we have enough data to establish current trends and that current trends continue - extrapolation is inaccurate and past climate models have incorrectly predicted current temperatures.
* New technology is being developed which may counteract the effects of global warming such as increased use of biofuels
* Some people do not believe in global warming and believe the evidence produced is just part of the earth's ~~natural~~ natural cycle

ResultsPlus
Examiner Comments

This response illustrates mark points 2, 1 and 5.

ResultsPlus
Examiner Tip

If there are 3 marks available and only one command word, in this case suggest, then you must make three suggestions for full marks.

(c) This survey shows that 61% thought future generations of people could be harmed by global warming.

Suggest why the rest of the people surveyed thought that future generations of people would **not** be harmed by global warming.

(3)

People often want to believe that global warming will not affect future generations, since it justifies that they can continue living unsustainable lives, where the use of fossil fuels is acceptable. People are reluctant to compromise their lifestyles (of technology, cars) to reduce their energy consumption, due to concerns of global warming. Research into global warming is still incomplete, so some believe there is not enough evidence that global warming is causing harm to the planet.

ResultsPlus
Examiner Comments

This response illustrates mark point 4 as well as mark point 2.

Question 8 (c)

In many ways the standard of responses to this question was disappointing, as there were quite a number of responses that were of a standard higher than one could expect at key stage three. Very few candidates achieved all 4 marks.

(c) Suggest an explanation for the effect of depth of water on the NPP in this freshwater lake.

(4)

The deeper the depth of water, the less the NPP. ~~Decrease~~

~~Deeper water has~~ Deeper water has less sunlight for photosynthesis, so the ~~less~~ plants in deeper water ~~able to~~ have ~~GPP. GPP is~~ less. GPP from photosynthesis. ~~Some~~ Some light get reflected by water, some light cannot penetrate through to deeper areas to reach plant, so less photosynthesis and less GPP. , less NPP because ~~as~~ GPP − R = NPP.

In deeper water plant may need to carry out more respiration then photosynthesis. So the value of R is bigger, GPP − R = NPP, thus NPP value is smaller.

(Total for Question 8 = 6 marks)

ResultsPlus
Examiner Comments

This response was awarded mark points 1, 4 and 6.

(c) Suggest an explanation for the effect of depth of water on the NPP in this freshwater lake.

(4)

Npp decreases as depth of water increases because there is less light reaching the deeper parts of the freshwater lake, so there is a lower Gpp as less energy is incorporated into the plants.
Also ~~maybe~~ there could be a higher amount of respiration in the organisms deeper down in the lake. And the organisms may lose the energy as heat and in movement, so reducing Npp.
Less light penetrate deeper water so less energy absorbed by organisms.
Less CO_2 available at deeper ~~part~~ areas of sea so less Gpp available.

ResultsPlus
Examiner Comments

This response was awarded mark points 1, 6 and 2.

ResultsPlus
Examiner Tip

Just because a question seems straightforward do not assume that the answer will be. Read through your answer carefully and decide whether you have made at least as many points as there are marks allocated to the question and whether your answer is of an A level standard or something you could have written in a GCSE.

Paper Summary

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

- read the question carefully, don't simply word spot
- write enough statements to match the number of marks allocated to the question
- attempt the question instead of leaving a blank space, you could pick up the odd mark
- be sufficiently prepared for questions assessing the AS content
- pay enough care and attention to the words chosen for the responses
- use the word they are defining in their definition.

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

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London WC2R 0RL.

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

cea
Rewarding Learning