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Examiners' Report

June 2010

GCE Biology 6BI01

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Introduction

In general, this paper worked well with a high number of candidates demonstrating a good knowledge and understanding of the Unit 1 specification. All marking points were awarded.

Candidates lost marks for reasons that have been highlighted previously, including:

1. Failure to read the question properly.

2. Using vague terms such as 'amount' and 'things'.

3. Not {identifying / understanding / appreciating} the command words, especially 'compare', 'distinguish between' or 'give differences between'.

4. Simply reiterating information given to them in the graphs or tables without drawing conclusions using the data.

5. Not quoting values from a graph or table, or not taking sufficient care reading the actual values.

6. Not appreciating that the terms valid, accurate, precise and reliable have different meanings and therefore cannot be used as interchangeable terms.

Question 2

This question was well answered by candidates who knew the names of the stages of the cardiac cycle and the valves.Candidates are expected to know the names of the stages of the cardiac cycle and the names of the chambers of the heart, the valves and the blood vessels entering and leaving the heart.

Question 3(a) (i)

Part (a) highlighted the fact that many candidates do not understand the difference between terms such as structure, role or properties.

> (i) Name the molecule labelled A and describe its structure.
>
> (3)
>
> Name ..... phospholipid ....
>
> Structure ..... Has a positively charged polar head, which is hydrophilic, and so can be in contact with water. Attached, is a fatty acid tail, which has a slightly negative charge and is hydrophobic. These lipids are not soluble in water.

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Examiner Comments

A large number of candidates described the properties of the phospholipid molecule in part (i), as illustrated by this response.

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Examiner Tip

Make sure before you go into the exam that you know the difference between the terms structure, function and properties and that you read the question carefully to identify exactly what you are being asked to describe.

Question 3(a) (ii)

Unfortunately, those candidates that had described the properties of the phospholipid molecule in part (a)(i) tried to write something different in part (ii). As a result, they scored no marks, even though it was clear from their previous answer that they knew the Biology.

Question 3(b)

In part (b), many candidates scored 3 marks and there were some very good responses.

(b) Some proteins in the cell membrane are involved in active transport and facilitated diffusion. Describe the role of proteins in these cell transport mechanisms.

(3)

Active transport Proteins act as pumps in membrane. These pumps cross right through membrane, are highly selective and transport substances from their low concentration to a high concentration so against gradient. They require ATP as energy for this to occur. e.g. K^+ and Na^+ in nerves

Facilitated diffusion Proteins are pumps transporting allowing substances that can't pass through the membrane by diffusion to pass. They facilitate the movement from the substance high concentration to a low concentration They dont require ATP as molecules use kinetic energy. e.g. ATP and ADP in the mitochondria.

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Examiner Comments

Although this candidate scored 3 marks max, the reference to 'pumps' in the second part of their answer would have negated a reference to channel protein; this is because 'pumps' implies active transport.

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Examiner Tip

When describing concentration gradients, do not refer to 'along', 'with' or 'against' concentration gradients as such descriptions are too vague.

Question 3(c) (ii)

Part (c) (ii) was poorly done. Very few candidates really understand that the phospholipids can move within the membrane and therefore contribute to the fluidity of the membrane. As a result, they could not explain how the results of this investigation could be explained by the fluid mosaic model.

Question 4(a) (i)

Part (a) was generally well answered except by candidates who either (i) tried to describe the differences between the levels of von Willebrand factor and fibrinogen at each level of cocaine use or (ii) reiterated what we had told them on the graph.

(i) Describe the effects of frequent and occasional cocaine use on the mean concentrations of von Willebrand factor and fibrinogen in the blood.

(3)

For ~~the frequent use of~~ cocaine ~~the~~ von Willebrand factor the frequent use of cocaine is 145 mg per cm³ and the occasional use is 80 mg cm³. The concentration of fibrinogen frequently us 330 mg cm³ and the occasional use is 230 mg cm³

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Examiner Comments

In this particular answer, the candidate has simply quoted values from the graph without drawing conclusions or manipulating the data.

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Examiner Tip

Do not tell us what we told you in the question, either in the stem of the question or on a graph.

Question 4(b)

Part (b) illustrated that either candidates do not understand the command words used in questions or that they do not read the question properly, using the clues that we give them in the question.

clotting process, suggest why frequent cocaine use could increase the risk of a blood clot forming.

(4)

The platelets stick to the endothelial cells lining in the blood vessel and changes shape, causing more substances to be released at platelets to be activated. This cause a chemical reaction prothrombin is conver led to thrombin an catalyst which converts fabrinogen to fabrin an an isoluble strand that causes platelets to stick to the blood so increase in frequent cocaine increases risk of blood clots because platelets cause the the blood vessel to narrow and clot Red blood cells.

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Examiner Comments

This candidate has written what they know about clotting and tried to link it into the question by repeating the stem of the question. They needed to use their knowledge to explain the role of clotting in this particular context.

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Examiner Tip

1. Whenever you see the command word 'suggest', identify which part of your specification the question relates to and apply that knowledge to the question. In this particular question we were examining you on your knowledge of the clotting process and whether or not you could link it to the information given in the question.
2. If you see an asterisk '*' against a question you must try to give your answer in a logical sequence and spell the Scientific terms correctly.

Question 4(c)

Part (c) illustrated the problems that candidates have in describing a correlation.

The description should consist of three components:

(i)   a comment about the change in the independent variable

(ii) reflected by

(iii) a comment about the change in the dependent variable

DO NOT SAY 'CAUSES'

Question 5(a)

A whole range of answers were seen for this question, ranging from zero up to 5marks max.

5 Cystic fibrosis is a genetic disease that can affect many body systems, including the respiratory system.

*(a) Explain how a gene mutation causes a build up of mucus in the respiratory system of a person with cystic fibrosis.

(5)

A gene mutation of gene 7 causes mucus to build up in the respiratory system of a person with cystic fibrosis. because this mutation means that the CFTR channel is inhibited in people with CF and the Na²⁺ is always open. The mucus is sticky because it doesn't have enough water and because of this the cillia cannot move/brush it up which causes the build up in the respiratory system. And because water can't move as freely in and out because of the high concentration of Na²⁺.

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Examiner Comments

This was a typically vague answer where the candidate had an idea of the gist of the problem, but no knowledge of specific details. They only scored one mark for refering to the inability of cilia to move the mucus out of the respiratory system.

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Examiner Tip

You need to do very thorough revision, ensuring that you know very fine detail that can be explained using correct terminology.

Question 5(b) (i)

This was a very clear answer scoring 2 marks.

(i) Suggest why people with cystic fibrosis are more likely to suffer from these lung infections than people without cystic fibrosis.

(2)

This is because people with cystic fibrosis have thick sticky mucus that doesn't allow effective beating of the cilia. The beating of cilia moves bacteria trapped in the mucus. But the bacteria grow in the lungs of those with cystic fibrosis because the mucus isn't moved easily.
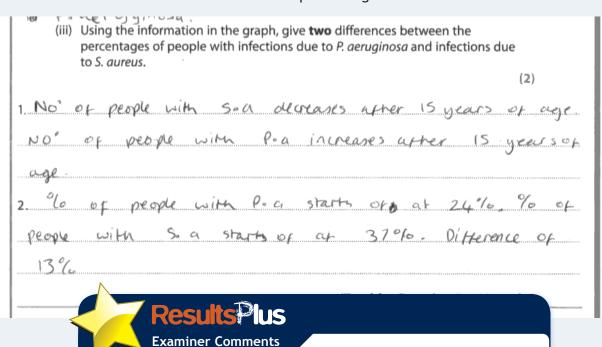
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Examiner Comments

Part (b)(i) was generally done well, except by candidates who made vague responses to patients having impaired immune responses.

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Examiner Tip

'Infections' do not get trapped in the mucus, bacteria do.

Question 5(b) (iii)

Part (b)(iii) was poorly answered by many candidates as they really do not know how to answer a question where the command word is either 'compare' or 'give differences between'.

(iii) Using the information in the graph, give **two** differences between the percentages of people with infections due to *P. aeruginosa* and infections due to *S. aureus*.

(2)

1. No' of people with S.a decreases after 15 years of age. NO° of people with P.a increases after 15 years of age.

2. % of people with P.a starts off at 24%. % of people with S.a starts off at 37%. Difference of 13%

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Examiner Comments

This response scored one mark for the first statement. However the second statement repeated figures without drawing conclusions and although they did a calculation there was no comment about the significance.

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Examiner Tip

1. Do not give two separate descriptions; each sentence should give an equivalent piece of information about the two things that you are asked to {compare/ distinguish between}.
2. Pick significant differences, not random differences.
3. Do not just read the information off the graph, interpret it. The example shown, in the second statement, does not interpret the information shown on the graph. The candidate should have written that the percentage of people with S. aureus is higher at birth than those with S. aeruginosa. If they had then said by 13% , that would have been 2 marks.
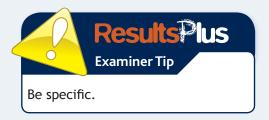
Question 7(a) (i)

Candidates need to read the question properly and think about their answer carefully to actually answer the question.

This was illustrated in part (a)(i) of this question. A large proportion of candidates could identify factors that influenced the incidence of CVD but did not give any polarity to their answer to state exactly how this increased the risk.

(a) (i) Name **two** factors that increase the risk of CVD.

(1)

1 Diet .

2 Exercise

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Examiner Comments

Candidates need to read the question carefully and then answer it.

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Examiner Tip

Be specific.

Candidates need to read the question carefully and then answer it.Be specific.*Question 7(b)*

A number of candidates tried to describe the role of a placebo, instead of stating what the placebo could be in this particular scanario.

Question 7(e) (ii)

One of the HSW requirements is that candidates can select appropriate material to answer a question.

> (ii) Explain why drug S could be a potential statin.
>
> (1)
>
> Because it shows that it causes less deaths, CVD and strokes compared to the placebo.

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Examiner Comments

In this response the candiate has not selected the appropriate information to answer the question. They have just listed everything that the data shows.
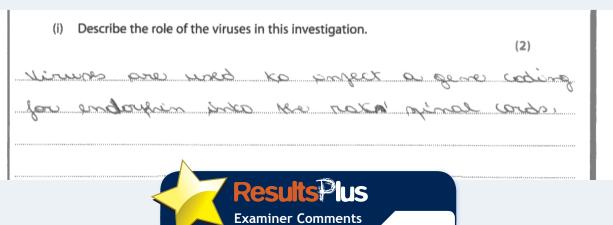
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Examiner Tip

We are not trying to catch you out, but if a question does seem so obvious, read through the question very carefully again before writing your answer.
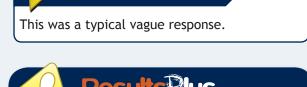
Question 8(a)

Part (a) was well done, provided the candidates described the effects of the gene therapy and not what happened to the control rats.

Question 8(b) (i)

Candidates do not fully understand the role of viruses, in this case, in gene therapy. Many candidates did not identify the virus as a vector and even more did not appreciate that the virus introduced the gene into the CELL.

(i) Describe the role of the viruses in this investigation.

(2)

Viruses are used to infect a gene coding for endorphin into the natal spinal cords.

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Examiner Comments

This was a typical vague response.

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Examiner Tip

The vector introduces the gene into the CELL

Candidates should do as many practice exam papers as they possibly can in the run up to the exam, including reading through the mark schemes afterwards. This not only familiarises the candidates with the format of the paper and style of the questions, but more importantly illustrates the sort of points we are looking for on the various topics.

Grade Boundaries

Grade	Max. Mark	A	B	C	D	E	N
Raw boundary mark	80	54	49	45	41	37	33
Uniform boundary mark	120	96	84	72	60	48	36

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