# GCSE

**Biology B**

Gateway Science Suite

General Certificate of Secondary Education **J643**

## Examiners' Reports

## January 2011

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**General Certificate of Secondary Education**

**Biology B (Gateway) (J643)**

## EXAMINERS' REPORTS

# Chief Examiner's Report

**General Comments**

The examination entries for this January session followed a similar pattern to previous years, with B631 attracting far more entries than B632.  The entries for B632 were similar to January 2010 candidates however there had been a significant increase in the entries for B631.

The papers all produced good spreads of marks and when distributions were plotted they formed appropriate bell shaped graphs.  The mean marks on three of the four papers were very similar, with B631/1 proving to be slightly more accessible than the other three.

The Principal Examiner reports which follow will indicate weaknesses and strengths on particular questions and part questions.

It is worth noting the following general comments:

- knowledge and understanding of certain areas of the specification have improved, such as immune response and infertility treatment

- many candidates are still unable to correctly use the term osmosis

- knowledge of kidney function was poor, in all but the most able candidates.

# B631/01 Modules B1, B2, B3 (Foundation Tier)

**General Comments**

The level of difficulty of the paper appeared to be appropriate for the ability range of the candidates, producing a good distribution of marks, covering almost the whole mark range available.

Questions targeted at grades C and D allowed the more able candidates taking the paper to demonstrate what they knew and understood, whilst questions targeted at grades E, F and G allowed all candidates access to the paper.

All candidates appeared to have had sufficient time to complete the paper, with most attempting most of the questions. The quality of candidates' spelling, punctuation and grammar was reasonably good and there were only a few cases where deciphering a candidate's writing posed a serious difficulty.

**Comments on Individual Questions**

1(a)   The majority of candidates were able to identify part D as only being found in females. However a significant number of candidates incorrectly identified the liver as the site of insulin production.

1(b)   The majority of candidates were able to describe one female secondary sexual characteristic.

1(c)   Common errors included the nervous system and the idea of hormones being carried inside the blood cells.

1(d)   The majority of candidates scored one mark for quick response, however, they lost the second mark for repeating the sentence 'she feels pain after she lifts her foot'. This was not enough to show clearly that they understood it was automatic.

2(a)   The majority of candidates were able to suggest a mass within the correct range. In part (ii) only the more able candidates understood the need to square the height. Many candidates simply divided 110 by 1.8 or even 180. Some candidates used their answer to part (i) in the calculation instead of Jack's actual mass.

2(b)   Most candidates successfully identified bacon as containing the most fat.

2(c)   The majority of candidates knew about liver damage in part (i). In part (ii) very few candidates understood that the cilia become damaged. Many incorrectly assumed the cells became covered in tar.

3(a)   Some candidates incorrectly assumed that intelligence is environment only and that genes and the environment control language.

3(b)   The majority of candidates knew that chromosomes were found in the nucleus. In part (ii) very few realised the answer was simply 28, many thought they needed to change the number in some way. 56 and 14 were common errors, as were 23 or 46.

4(a)   The majority of candidates scored at least one mark. Many candidates still incorrectly refer to white blood cells fighting disease instead of engulfing pathogens.

4(b)   Most candidates understood that treatments needed to be tested to make sure they were not harmful.  Those candidates that lost the mark did so because they only referred to 'the effects the drugs might have' not the harmful effects they might have.

5(a)   The majority of candidates were able to identify the correct adaptations.  A number of candidates did think that warm blooded should have been a correct response.

5(b)   In part (i) candidates could successfully describe the meaning of endangered.  The majority were also able to identify reasons why the red kites were endangered.

5(c)   Many candidates simply repeated the stem of the question or referred to safe habitats where they could breed successfully.  Candidates should be encouraged to use the correct terms such a 'captive breeding programs' and explain why habitats are safe, eg places where hunting is banned.

6(a)   The majority of candidates gained all three marks for part (a).

6(b)   Again the majority of candidates gained the mark for part (b)

6(c)   Some candidates were able to gain one mark in part (i) for realising they needed to multiply the size of the quadrat by 4.  However, few candidates could calculate the correct answer of 16 limpets.  Error carried forward allowed more candidates to gain a mark in part (i).

7(a)   The majority of candidates realised the remains were fossils in part (i).  In part (ii) many candidates incorrectly described the way remains are preserved in rocks instead of stating an alternative means of preservation to the stem of the question.  Some candidates thought the question asked them how we could preserve the remains. This resulted in answers such as 'in oil' or 'put them in the freezer.'  Part (iii) was answered well by most candidates.

7(b)   A common error was to state what the plants needed for photosynthesis, eg sunlight.

7(c)   The majority of candidates were able to give a correct answer.

7(d)   Some candidates simply said the plants in layer D were older.  They needed to say that they looked different or came from different periods in time.  A number of candidates incorrectly referred to the plants as animals.

8(a)   Very few candidates referred to gravity in their answer.  Although the majority gained marks for shoots growing towards light and roots towards water they lost the third mark because they did not mention direction as in up and down.

8(b)   Less than half the candidates correctly identified fruit ripening.  Many thought the answer was 'flowers attract insects'.

8(c)   The majority of candidates gained both marks.

9(a)   Candidates were unsure of the chemical that genes are made of.  Many gave nucleus or amino acids as an answer. In part (ii) many candidates referred to a lack of nucleus or cell wall in the sperm cell.  When answering in terms of movement candidates should be encouraged to use the term 'swim' ie 'egg cells cannot swim' instead of 'egg cells cannot move'.

9(b)   The majority of candidates scored at least one mark, mostly in part (iii).  However many candidates thought Jenny was growing at her fastest when the gradient was at its steepest and not when the curve peaked.

10(a) Very few candidates understood that the embryo is split before being placed into surrogate cows.  However many did gain one mark for placing the embryo into the surrogate cow.  Candidates should be discouraged from using the word 'it'.  Sometimes it was difficult to determine exactly what had been placed inside the cow ie sperms, eggs or embryos.  Only the minority of candidates understood that the advantage is that you get **more** identical calves.  The majority just answered in terms of the calves having the qualities you were looking for, which is also true of selective breeding.  Most of the candidates correctly answered part (iii).

10(b) The majority of candidates scored at least two marks.  However some candidates thought that blood passes across the placenta.  In part (iii) many candidates thought the question asked how did the substances get to the embryo and not around the body of the embryo.  This meant they gave the incorrect answer of umbilical cord.

10(c) Very few candidates realised a mutation had taken place.  The majority of candidates attempted to answer in terms of recessive genes missing the point about them being clones.

# B631/02 Modules B1, B2, B3 (Higher Tier)

**General Comments**

The level of difficulty of the paper appeared to be appropriate for the ability range of the candidates, producing a good distribution of marks, covering virtually the whole mark range available. Questions targeted at grades A*, A and B allowed the more able candidates taking the paper to demonstrate what they knew and understood, whilst questions targeted at grades C and D allowed all candidates access to the paper.

Candidates appeared to have had sufficient time to complete the paper, with most attempting most, if not all, of the questions. The quality of candidates' spelling, punctuation and grammar was good overall and there were only a few cases where it was very difficult to interpret a candidate's writing.

**Comments on Individual Questions**

1(a)  Three quarters of candidates knew that insulin lowers the blood sugar level.

1(b)  Most candidates were able to write down one female sexual characteristic, usually breast development, although a few ignored the instruction in the question and wrote about periods.

1(c)  Although a majority of candidates gained at least one mark, usually for describing the role of oestrogen, few gained both, ie the role of progesterone seemed to be less well appreciated. A common response was to say that oestrogen thickens the uterus lining (one mark) and progesterone thins it.

2(a)  Virtually all candidates correctly described Jack as obese in part (i). Two thirds of candidates correctly calculated Jack's BMI in part (ii). Common errors were to double the height, to miss out the decimal point in 1.80 or to fail to square the height. Candidates should be aware of the need, in calculations, to correctly round their answers; incorrect rounding meant a maximum of one mark.

2(b)  Many candidates did little more than reword the question in part (i), simply stating that the cells had been damaged by chemicals in cigarette smoke. Only a few correctly mentioned that it was the cilia that were damaged or the consequence of this being a build up of mucus. In part (ii) just over half the candidates explained that alcohol is toxic, that alcohol is broken down in the liver or that alcohol causes cirrhosis. Common shortcomings were to just reword the statement from the question that alcohol damages the liver, or to suggest that alcohol is just too strong.

2(c)  In part (i), to explain why sweating causes loss of heat it is necessary to refer to its evaporation. Only just over half the candidates were able to do this. Some candidates confused sweating with vasodilation, others thought that sweat itself is cold and some thought that it is heat that evaporates. In part (ii) just over half the candidates were able to explain what happens to the lactic acid that builds up in muscles, with a variety of acceptable answers, such as it being broken down or removed to the liver. Although a few stated that it is broken down to carbon dioxide and water, rather more thought it is converted to glucose. There were some vague references to oxygen debt.

3(a)  Most candidates were able to write down A, T, C and G as the four bases in DNA.

3(b)    Part (i) proved a testing question with only about a third of candidates giving 28 as the number of chromosomes in the egg cell.  Understandably, 56 and 14 were common incorrect answers.  '14 pairs' was not allowed as the chromosomes in an egg cell are not in pairs.  Even fewer candidates than in part (i) were able to correctly calculate the answer in part (ii), in this case 58.  Many forgot to double up and gave 29.  Some divided 57 by 2 and gave 28.5.

3(c)    Around half the candidates correctly explained that mutated DNA contains a different sequence of bases in part (i).  The common, non-scoring, answer was simply that the DNA was different in some way.  In part (ii) a quarter of candidates gained the mark for correctly stating both that the mammoth was homozygous and the reason why this must be the case.

4(a)    To gain full marks, candidates had to correctly refer to antigens on the virus causing the production of antibodies, and the body retaining the ability to quickly produce those antibodies in the future.  This question proved a very good discriminator with roughly equal numbers of candidates gaining each of the marks from nought to three.  Candidates who did not gain full marks generally did so through missing out one or more of the marking points rather than incorrect science, although there was some confusion between antibodies and antigens, and with phagocytosis in the lower scoring answers.  The marking point most frequently gained was for the production of antibodies.  Weak answers just referred to the body fighting the virus and remembering how to do this.

4(b)    Most candidates correctly explained that new treatments are tested to check for side-effects or to check they are not harmful.  The common non-scoring answer was simply to see if they have an effect.

5(a)    In part (i) most candidates correctly chose population.  In questions like part (ii), where there are two aspects to the question and two marks, candidates should be encouraged to give at least two distinctive points in their answers.  Marks were mostly commonly given for the ideas of captive breeding, protecting the red kites' habitat and banning hunting them.

5(b)    Many candidates did not seem to appreciate what the artificial ecosystems in the question might refer to, for example farmland, and as a result this proved hard for many, with about a third gaining the mark.  Many candidates simply referred to the kites being affected by the loss of their habitat without suggesting why, or suggested that they couldn't adapt to the new conditions.

6(a)    Over half the candidates correctly calculated the average number of limpets as 16 per m2 in part (i).  The most common incorrect answer was 160.  In part (ii) over two thirds of candidates correctly calculated an estimate for the total number of limpets.  The expected answer was 2560 but the principle of ECF (error carried forward) from part (i) was applied, so other answers also gained credit.

6(b)    The expected answers were the ideas that the samples taken provided too little data or could be unrepresentative of the population as a whole.  Credit was not given for just repeating what the question had already said.  So for example, for the second part, saying that no samples were taken from the lower shore did not gain a mark, but saying that there might be more limpets on the lower shore would.  Just less than half the candidates gained one mark, and a similar number gained two.

6(c)    Just over half the candidates correctly chose B and D.

7(a)    Most candidates gained at least one mark in part (i) and the majority gained two for choosing the correct words about fossilisation. In part (ii) with a variety of acceptable answers as to how fossilisation can occur, such as in ice, tar or amber, it was disappointing that many candidates ignored the instruction in the question and instead described ways of preserving them in rock, eg by them being covered in mud. Nevertheless, a majority of candidates did gain the mark. Part (iii) was a good discriminator with broadly similar numbers of candidates gaining none, one or two marks. Candidates should always be encouraged to give as much detail as possible in their answers. So for example, saying that some body parts do not fossilise did not gain a mark, but saying that soft parts do not fossilise did gain a mark. A mark was most commonly given for the idea that not all fossils have been found yet.

7(b)    As a question targeted at the top grade this was designed to be a difficult question, and so it proved, with only a small minority gaining one mark, and very few candidates gaining two. Common weaknesses were to either just restate the question, that plants of one type just evolved into plants of another type, or to give generic descriptions of evolution or natural selection without linking it at all to the example given. Regardless of whether they gained marks or not, it was clear that many candidates seemed unfamiliar with the idea of natural selection working on variation that is already present and think instead that organisms just change when there is a need to, or there is a benefit from doing so.

8(a)    Most candidates correctly chose chlorophyll.

8(b)    Around half the candidates correctly completed the balanced symbol equation. Pleasingly, there were few candidates who lost marks by incorrectly using subscript, or by using lower case for the letters.

8(c)    Most candidates correctly explained that there is more light, or higher temperatures, in the summer.

9(a)    Over half the candidates knew that egg cells are produced by meiosis in part (i). In part (ii) only a few candidates correctly explained that Gill's eggs contain different combinations of chromosomes. Instead, candidates often tried to answer by invoking the father's sperm cells, or said that the children would have received identical sets of chromosomes from their mother. Around half the candidates knew that a fertilised egg cell is called a zygote in part (iii). Perhaps understandably, many chose foetus.

9(b)    Around half the candidates correctly interpreted the graph and identified Jenny's fastest growth as occurring at the peak of her graph, around the age of 13. More candidates, around three quarters, were however able to correctly identify that Richard started puberty around age 11 for part (ii). Most candidates realised that Jenny's height would stay the same (or almost the same) after the age of 18.

10(a)   In part (i) most candidates gained one mark but only a small number gained both marks for completing the flow diagram of the stages in cloning by embryo transplant. Fewer candidates gained the mark for the idea of splitting the embryo than did for the idea of implanting the embryos in several surrogates. Some candidates did not seem to appreciate what an embryo was and suggested that it needed fertilising with sperm. In part (ii) only a relatively small number of candidates realised that there are advantages to cloning by embryo transplant other than the fact that the offspring are genetically identical, for example the idea that lots of clones can be produced. Too many candidates ignored the instruction in the question and instead gave the genetically identical idea. Others gave advantages of the process that are also advantages of selective breeding, eg an increased milk yield. In part (iii) although some candidates seemed unclear what the term gene pool means, around half the candidates were able to explain that a reduced gene pool would have less genetic variation. A common error was to state that there would be fewer genes.

10(b) As part (i) was targeted at the top grades, understandably only around half the candidates gained any marks. Among these, the question discriminated well, with a similar number of candidates gaining either one, two or three marks. The fact that DNA unzips was well understood by those who gained any marks, with fewer explaining that it is new bases that add on, and fewer again explaining that bases combine in a complementary fashion. Many candidates chose to answer with diagrams and these proved just as likely to gain marks as the prose answers. Some candidates confused DNA replication with mitosis or meiosis and described chromosomes being pulled to opposite sides of a cell. Over half the candidates correctly chose the option that the proportion of cells that are stem cells decreases with age in part (ii).

11(a) Around a third of candidates correctly explained that Bob's lungs have a smaller surface area in part (i). As a question targeted at the A* grade, part (ii) was designed to be challenging and so it proved. Only a very few candidates appreciated that some oxygen would travel from the blood to the alveoli, ie against the concentration gradient, because diffusion is a random process and that it is only the net movement that occurs from a region of high concentration to a region of low concentration. One common misunderstanding was that oxygen would initially move from the alveoli to the blood resulting in a higher concentration in the blood causing oxygen to move back into the alveoli again. Less than half the candidates knew that oxyhaemoglobin is the new substance formed when oxygen enters red blood cells in part (iii). The most common incorrect answer was haemoglobin.

11(b) In part (i) less than half the candidates explained that cholesterol restricts blood flow by forming a plaque or by describing how it builds up on the walls to narrow the available space inside blood vessels. Marks were not awarded for answers that did not add anything to information already given in the question, eg that blood flow is stopped or blocked. Over half the candidates were able to explain the consequence of the ventricles not working efficiently in part (ii), the simplest acceptable answer being that blood is not pumped as quickly around the body. Other scoring answers commonly seen referred to heart attacks or strokes or less oxygen being carried in the blood. Two thirds of candidates were able to explain the advantage of avoiding the possibility of rejection by taking the replacement vessel from the patient rather than a donor. Many candidates however thought that you have to match blood types.

# B632/01 Modules B4, B5, B6 (Foundation Tier)

**General Comments**

The level of difficulty of the paper appeared to be appropriate for the ability range of the candidates, producing a good distribution of marks, covering a wide mark range. Questions targeted at grades C and D allowed the more able candidates taking the paper to demonstrate what they knew and understood, whilst questions targeted at grades E to G allowed all candidates access to the paper.

Candidates appeared to have had sufficient time to complete the paper, with most attempting most, if not all, of the questions. The quality of candidates' spelling, punctuation and grammar was generally good overall and there were only a few cases where it was very difficult to interpret a candidate's writing.

**Comments on Individual Questions**

1(a)   Only around half the candidates correctly identified C as the vacuole. The most common mistake was to not appreciate that there were two cells and choose D, the space between them, instead.

1(b)   Unfortunately, and predictably, most candidates stated that the job of A, the cell wall, was 'protection'. Only a minority knew that it provides support or stops the cell bursting.

1(c)   Although there was a spread of marks ranging from one to three, the majority correctly chose all three answers.

1(d)   Most candidates knew that minerals are taken in by the roots in part (i). In part (ii) less than half the candidates were able to state that as well as nitrates and phosphates, NPK fertilisers also contain potassium.

2(a)   This proved a very difficult question. Few candidates appreciated that the plastic bag would stop water escaping and so reduce transpiration losses. Instead many thought that it might, for example, stop oxygen getting to the plant.

2(b)   A majority of candidates were able to locate the position of the xylem in the diagram.

2(c)   Most candidates were able to complete the table correctly in part (i). If marks were lost it was commonly for sign errors. As the part (ii) was targeted at a C grade, understandably the vast majority of candidates taking this paper found it very difficult to explain how osmosis worked to cause the experimental results.

3(a)   Most candidates correctly chose herbicide.

3(b)   With a variety of acceptable answers as to why using insects to control knotweed might cause problems, the majority of candidates made a valid suggestion.

3(c)   A majority of candidates were able to state at least one of oxygen or water as factors the bacteria need to cause decay, and around a third gave both. The most common error was light.

3(d) Most candidates gave at least one way of preserving fruit and many gave two. In questions like this, candidates should try to give two contrasting ideas; putting fruit in the fridge and the freezer, for example, only gained one mark. As this question was about fruit, methods that might be used with other foods, but would not be appropriate for fruit, such as salting, were not credited.

4(a) Most candidates gained at least one mark, but less than half of all candidates gained two.

4(b) Almost all candidates correctly named sweat in part (i). Few candidates knew that the liquid part of the blood is called plasma in part (ii). By far the most common answer was 'puss' (sic). Part (iii) was targeted at G grade but proved harder than expected with a third of candidates not being able to correctly identify the two blood groups.

5(a) Most candidates correctly worked out the answer of 3 years from the graph.

5(b) A minority correctly calculated the average height increase per year as 8.25cm in part (i). A majority correctly described this period as puberty in part (ii).

5(c) Around half the candidates correctly gave one advantage of hollow bones compared with solid ones in part (i), the most common answers being that they are lighter or break less easily. Almost all candidates correctly chose X-rays in part (ii).

5(d) The majority of candidates knew that replacement hip joints have a limited life span because they wear out. Marks were not awarded however if candidates used incorrect terminology, such as 'rots', 'decays', 'rusts' or 'corrodes'.

6(a) In part (i), although most candidates gave the name of a blood vessel, very few candidates were able to correctly name the coronary artery. Around half the candidates gained one mark for explaining that the blockage would reduce blood flow in part (ii), although only a few were able to extend that by describing any specific consequences, such as reduced oxygen transport.

6(b) Two thirds of candidates knew that anti-coagulant drugs prevent clotting.

6(c) Most candidates were able to gain some marks for describing how pulse rate can be measured, with half gaining the full three marks.

7(a) Less than half the candidates were able to name an element recycled in the soil in part (i), nitrogen being the most common correct answer. Marks were not given for answers, such as nitrates, that did not name an element. Two thirds of candidates gave a valid other reason for why plants need soil in part (ii).

7(b) Three quarters of candidates correctly calculated 2200 in part (i). Two thirds of candidates explained that compost improves crop yield by providing minerals in part (ii). In part (iii) although there were a variety of acceptable reasons for why worms increase the yield further, such as improving aeration or increasing the surface area of the compost, most candidates found this difficult. There were many non-scoring answers either describing the worms eating compost or eating apparently harmful things in the soil, such as bacteria.

7(c) About half the candidates correctly stated that the bacterial gene is inserted into the tea plant. Some candidates lost marks by referring to 'it' when it was unclear what 'it' was.

8(a)   Half the candidates were able to give one way bacterial cells are different from plant and animal cells.  The most common correct answer described the lack of a nucleus, with very few giving the expected low demand answers that they are smaller or simpler.  Three quarters of candidates gained the mark in part (ii) for correctly matching the features of *Lactobacillus* with the reasons for the features.

8(b)   Around half the candidates correctly chose B.

8(c)   A majority of candidates were able to name another type of food made by bacteria, usually cheese.  A noticeable minority named yoghurt despite this already being in the question.

9(a)   In part (i) most candidates were able to name two ways that microorganisms can enter the body.  Either routes, such as mouth or nose, or mechanisms, such as when eating or breathing, were acceptable, although vague answers such as 'sneezes' or 'touch' did not gain credit.  Around half the candidates knew that cholera can be treated with antibiotics.  The others either named other drugs, such as aspirin, or left the part (ii) blank.

9(b)   About half the candidates knew that zooplankton are microscopic animals in part (i).  The majority of candidates were able to name one other factor affecting the number of zooplankton in part (ii), the most common answers including the presence of food or predators.

10(a)  The process of fermentation to make cider was not well understood.  Although some knew that yeast was added, more thought that alcohol needed to be added to the apples to start with.  Only half the candidates gained any marks and only a handful gained the full three marks.

10(b)  Over a quarter of candidates did not attempt part (i) and of those that did, only a very small number correctly named distillation as the process by which spirits are made.  Very few candidates could explain that turning cider into a spirit is illegal without a licence in part (ii).

# B632/02 Modules B4, B5, B6 (Higher Tier)

**General Comments**

The level of difficulty of the paper appeared to be appropriate for the ability range of the candidates, producing a good distribution of marks, covering almost the whole mark range available. The paper gave candidates the opportunity to show what they know, understand and can do and there was real stretch and challenge at grades A and A*. All candidates appeared to have had sufficient time to complete the paper, with the majority attempting most of the questions.

Where students scored very low it was clear that these students should have been entered for foundation paper. Section C seemed to be less well answered than the previous two, with quite rambling answers in some cases.

The quality of candidates' spelling, punctuation and grammar was good however there were a few cases where deciphering a candidate's writing posed a serious difficulty.

**Comments on Individual Questions**

1(a)  The majority of candidates were able to complete the sentences correctly. The most common error was the use of the word chloroplast instead of chlorophyll.

1(b)  Few candidates correctly answered part (i). Many missed the word element in the question and therefore gave the incorrect answer of phosphates. In part (ii) only the more able candidates clearly understood the role of active transport in the uptake of minerals.

2(a)  The majority of candidates correctly linked water loss to the change in mass. Those candidates that lost the mark did so because they answered in terms of gas exchange or photosynthesis.

2(b)  Over half the candidates were able to identify the position of the xylem in part (i). In part (ii) many candidates confused the question with ideas about exchange surfaces. The cause them to answer in terms of surface area, permeability of membranes and the thin walls.

2(c)  The majority of candidates were able to calculate the missing result correctly in part (i). In part (ii) very few candidates were able to clearly explain osmosis. The most common error was not to mention water concentration. When candidates say that the water moves from a high concentration to a low concentration they need to make it clear that they mean a high water concentration.

3(a)  The majority of candidates were able to suggest a possible problem. However some candidates lost the mark because they simply said the herbicide might affect his other plants and not that the affect was harmful.

3(b)  The majority of candidates answered this question correctly.

3(c)  In part (i) candidates failed to mention that oxygen is required for the decomposers. Simply saying the air holes let in oxygen was not enough to award the mark. Most candidates gained at least one mark in part (ii).

4(a) Many candidates were unable to correctly identify the aorta in part (i).  In part (ii) many answers did not refer to the heart muscle.  Instead candidates incorrectly thought blood would no longer travel around the whole body.  There were mixed responses to part (iii) with about half the candidates giving the correct answer of bypass surgery.

4(b) Most candidates gained at least one mark.  Those that lost the second mark did so because they tended to give two different ideas of why there are few donors.  Candidates also incorrectly referred to blood type instead of tissue type.

5(a) The majority of candidates were able to identify the correct age for Jack.

5(b) Only the more able candidates correctly calculated the height increase.

5(c) About half the candidates identified the pituitary.  The brain being a common error.

5(d) In part (i) most candidates understood that hollow bones are lighter or stronger.  They were also able to explain that replacement joints wear away.

6(a) About half the candidates identified the correct hormones.  FSH and LH were common errors.

6(b) Most candidates gained at least one mark, if they lost the second it was mainly due to giving to answers from the same marking point eg 'it is not natural' and 'it is not ethical'.

7(a) Question seven provided the stretch and challenge required of a higher tier paper.  Very few candidates were able to apply their knowledge of the kidney and compare it with the dialysis machine.  Simple answers such as they both involve veins and arteries were not awarded marks.  Candidates needed to say they both remove urea not that they both clean the blood or make urine.

7(b) Very few candidates clearly understood the concept of net diffusion.  Many answered in terms of diabetes.

8(a) The majority of candidates knew that compost provides minerals in part (i).  However few could calculate the percentage increase.  Many forgot to calculate the increase first and therefore gave an answer of 125%.  Most candidates understood that worms aerate the soil.

8(b) About half the candidates identified restriction enzyme in part (i) but very few could name one type of nitrogen-fixing bacteria.  Many gave the incorrect answer of *Nitrobacter*.

9(a) The majority of candidates explained that bacteria had no true nucleus.  However some candidates identified the cell wall as the difference forgetting that plants have cell walls.  Part (ii) was answered correctly by most candidates.

9(b) Candidates were able to identify stage B as the correct answer.  In part (ii) they clearly understood that cats were intolerant to lactose.

10(a) The majority of candidates gave either bacteria or Vibrio as the correct answer.

10(b) In part (i) candidates tended to give the correct answer.  Those that lost the mark mentioned a type of pollution which was simply repeating the stem of the question.  Many candidates were able gain both marks for explaining how the data supported the theory.

11(a) Many candidates lost marks for placing yeast into the equation in part (i). Very few candidates knew that the rate doubled for every 10 ⁰C rise. Only the more able candidates understood that yeast is killed in high levels of alcohol. Many candidates answered in terms of temperature denaturing the yeast or enzymes.

11(b) Few candidates knew the term distillation many gave the incorrect answer of fermentation. In part (ii) the majority thought it was dangerous and would blow up, very few knew that making spirits needs a licence.

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