

UNIVERSITY OF MALTA

**SECONDARY EDUCATION CERTIFICATE
SEC**

BIOLOGY

May 2013

EXAMINERS' REPORT

**MATRICULATION AND SECONDARY EDUCATION
CERTIFICATE EXAMINATIONS BOARD**

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SEC Biology May 2013 Session Examiners' Report

Part 1: Statistical Information

The Table below shows the distribution of grades for the May 2013 session.

| GRADE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | U | ABS | TOTAL |
|-------------------|------|------|-------|-------|-------|------|------|-------|------|-------|
| PAPER A | 95 | 143 | 221 | 254 | 141 | | | 227 | 7 | 1088 |
| PAPER B | | | | 35 | 48 | 83 | 55 | 210 | 17 | 448 |
| TOTAL | 95 | 143 | 221 | 289 | 189 | 83 | 55 | 437 | 24 | 1536 |
| % OF TOTAL | 6.18 | 9.31 | 14.39 | 18.82 | 12.30 | 5.40 | 3.58 | 28.45 | 1.56 | 100 |

Part 2: Comments regarding candidate's performance

- Although candidates are being directed according to previous SEC Biology Examination Reports, the following misconceptions need to be addressed:
 - the improper use of breathing, respiration and gaseous exchange;
 - digestion occurring in the pancreas (possibly due to the name of pancreatic juice).
- A larger number of candidates answered the question on Genetics correctly.
- Candidates do not keep to the indicated lines when answering the questions in Paper I.
- Compared to other questions, candidates' performance is poor when they answer the question on experimental design in paper II.

Paper I

Compared with previous years, candidates did well in the genetics question.

A large number of candidates are still unaware that the marks allotted to each question indicate the amount of detail expected in their answers.

| Question 1 | | |
|------------|-----------|---|
| a. | | Most candidates did well. Incorrect use of prepositions often changed meaning to answers completely e.g. on the skin vs in the skin have completely different meanings. When describing the location of the ureter, a number of candidates incorrectly referred to the penis and / or vagina. |
| b. | | Candidates did better in 1a than 1b. Some candidates wrote the function instead of the exact location of the structure in question. |
| Question 2 | | |
| a | i | Most were correct. Incorrect answers included starch and glucagon. |
| | ii | Most answers were correct. |
| b | i | Incorrect answers included the pituitary gland and Islets of Langerhans. |
| | ii | Some candidates did not specify the type of cell and answered animal cell or just named an unrelated example. |

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| c | | Only a minority of candidates obtained full marks. Many just described the function of blood. |
| d | i | Incorrect answers for this question included fainting, diabetes or reference to blood pressure. |
| | ii | Most candidates knew that glucose is used by cells to harvest energy but only a handful indicated the maintenance of water potential relationships between blood and tissue fluid. |
| Question 3 | | |
| a | | A large number of candidates were penalised as they did not underline the term <i>Trachinus</i> . |
| b | i | Most candidates failed to link the fact that predators attack the Great Weever from above as it lives at the bottom of the sea. |
| | ii | A small amount of candidates mentioned the presence of gills and many candidates introduced 'breathing' rather than gaseous exchange. |
| c | | Most answers were correct, indicating the proper word 'camouflage'. Another correct answer was 'blend well'. |
| d | | Most answers were correct. The most common incorrect answer was predator-prey relationship. |
| e | i | Most answers were correct but some candidates misspelt the term Crustacea. |
| | ii | Most answers were correct. Incorrect answers included different characteristics and different scientific name, rather than making direct reference to 3 different genera. |
| Question 4 | | |
| a | i | Most candidates replied correctly. |
| | ii | The idea of variables was often not mentioned. At times candidates mentioned precautions which are not related to Biology, example place apparatus on a flat surface; to ensure accurate results. |
| b | i | Most candidates answered correctly and even named the proper term 'denatured'. |
| | ii | Only a handful of candidates were awarded full marks, as only few mentioned the active site and what happens after. Many candidates once again repeated 'denaturation', that is the answer to question bi. |
| c | i | The term emulsification was used correctly by the majority of candidates. |
| | ii | Some candidates mentioned the increase in surface area of the lipid droplets but failed to mention the interactions between the substrate and the enzyme. For this reason, only one mark was awarded to most of the candidates. |
| Question 5 | | |
| a | i | Most candidates either got i, ii and iii all wrong or all correct. At times the lines that were drawn to show the location, were unclear, particularly when labelling the diastema. |
| | ii | As above |
| | iii | As above |
| b | | Most answers included the absence of a diastema and/ or a horny pad. Candidates often noted the presence of canines in the lion but failed to indicated that they were large and pointed. |
| c | | Most answers were correct. |
| d | | Incorrect answers included kidney, stomach and intestines. |
| e | | Most candidates answered this question well. |
| f | | Incorrect answers included physical features such as eyesight, night vision and dentition. These were only a minority as most candidates answered running fast, hunting in packs and catching sick and vulnerable prey. |
| g | i | Most answers were correct. The most common mistake was to mention the diploid number of human chromosomes, that is 46. |
| | ii | Most answers were correct. The most common mistake was to mention the haploid |

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| | | number of human chromosomes, that is 23. |
| h | | The most common answer included there is more haemoglobin to carry oxygen. Degeneration or lack of nucleus was very scarcely mentioned. |
| Question 6 | | |
| a | i | The term related to the molecular unit of heredity was frequently cited correctly, however some incorrect terms included <i>trait</i> or <i>genetic</i> . |
| | ii | The term mutation was frequently correctly mentioned. However incorrect written terms included <i>Usher Syndrome</i> and <i>genetic disorder</i> . |
| b | i | Candidates often wrote the genotype correctly. |
| | ii | Candidates often wrote the genotype correctly |
| c | | Candidates generally performed well in this question. Still a number of candidates lost most of the marks since they worked the genetic diagram in a sex linked manner. |
| d | | Similarly in this question, a number of candidates incorrectly worked out the question in a sex linked manner. |
| Question 7 | | |
| a | | Candidates correctly mentioned the phylum to which amphibians belong. |
| b | i | However candidates mentioned incorrect internal structural characteristics present in a caecilian. Incorrect characteristics included presence of <i>legs, lungs, digestive system, skeleton, and spinal cord</i> . |
| | ii | The comparison between the skin surface of a caecilian and that of a snake was generally adequate. Most answers referred to the smooth moist skin in caecilians and the dry scaly skin in snakes. |
| c | | Candidates often failed to link correctly the presence of caecilians in moist habitats to the need to return to water to lay eggs or to retard water loss. Some candidates mentioned to need of caecilians to conduct gas exchange over skin surface. Some common incorrect explanations included <i>since they are cold blooded, or without water they dry out and die</i> . |
| d | i | Candidates scored well in the last part of the question related to the mammals group of animals that give live birth to live young. |
| | ii | Furthermore candidates explained correctly that fertilised eggs inside the mother's body are protected from predators. Some also mentioned the advantage of nutrients' supply to the developing young. |
| Question 8 | | |
| a | | The ovary gland that secretes oestrogen and progesterone was often confused with the pituitary gland. |
| b | | Candidates generally labelled the progesterone and oestrogen levels adequately. |
| c | | Candidates often wrote incorrect descriptions of the progesterone levels in pregnant females – indeed most candidates simply mentioned that progesterone increases – rather than that progesterone levels remains high or increases and remains constant. |
| d | | The pituitary gland was generally correctly mentioned. |
| e | i | The definition of the zygote was generally correct and reference to the diploid cell formed after sperm fertilizes ovum was evident. |
| | ii | The name of the organ that provides the foetus with its requirements was often incorrectly listed as the umbilical cord instead of the placenta. |
| f | | Frequently the cited example of the birth control method/s used by females to prevent entry of sperm included the femidom or diaphragm. Some incorrect examples included the coil and birth control pills. |
| g | | The description of the temperature method and Billing's method referred to the changes in temperature and type of mucus. |

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| Question 9 | | |
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| a | i | Generally candidates are still encountering difficulties to answer questions of the 'give a biological explanation type'. Indeed candidates lost marks primarily because of lack of detail and focus. In the car pool poster candidates often referred to the advantage of less traffic without highlighting the reduction in fumes/exhaust/air pollution. Only a minority of candidates mentioned specific air pollutants. |
| | ii | Similarly in the canvas bag poster candidates often referred to the production of bags instead of the limited use of plastic/paper bags when compared to the re-usability factor of canvas bags. Only a limited number of candidates referred to the increase in litter with the use of plastic/paper bags. |
| | iii | The saving land poster was often linked to urbanisation and the destruction of habitats – candidates failed to link the process to increase in numbers of endangered/extinct species. |
| b | | Candidates often cited plausible ways of preventing dumping rubbish in the countryside. Most candidates included recycling, re-using, repairing items, bulk refuse service, law enforcement and CCTV cameras as possible ways to prevent dumping of rubbish. |
| Question 10 | | |
| a | i | Very often candidates distinguished clearly between diffusion and active transport. |
| | ii | Candidates failed to distinguish clearly between transpiration and translocation. The answers indicate that candidates have a misconception about the translocation process. |
| | iii | Candidates often distinguished clearly between interspecific and intraspecific competition. |
| b | i | The commonly cited similarities between mitosis and meiosis referred to the cell division aspect and the production of new cells. |
| | ii | The differences mentioned included the site of the different processes, the number of chromosomes, the difference between clones in mitosis and diverse cells in meiosis. |

Paper 2A

| Question 1 | | |
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| a. | | Most candidates answered this question correctly. Some candidates used the phrase 'internal fertilisation' to refer to gestation <i>in utero</i> . |
| b | i | The majority of candidates did not answer this question correctly. Most candidates defined species as a group of organisms sharing similar characteristics. Several candidates defined species as being the last taxonomical category. |
| | ii | Most candidates answered this question correctly. |
| c | i | Many candidates said that sloths have a slow acting stomach so that food may be digested slowly so that energy may be released gradually. Others said that the diet of the sloth does not provide enough energy for the stomach to act more rapidly. Some candidates said that the food sloths eat is difficult to digest but made no reference to cellulose in plant cell walls. |
| | ii | The majority of candidates quoted the text in the passage and said that 'the bacteria produce enzymes that help to break down the tough leaves'. |
| d | i | The majority of candidates said that a low calorie diet yields less energy and hence cannot permit a high metabolic rate. This would ensure that the little energy available is not used too quickly. |
| | ii | The majority of candidates answered this question correctly although some said that sloths exhibit slow movement in order to conserve energy. |

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| e | | Many candidates said that sloths don't move to prevent an increase in their body temperature. |
| Question 2 | | |
| a | | The majority of candidates drew the bar chart correctly although some drew the bar chart on the squared paper while others superimposed the two graphs. Many candidates did not include a title. |
| b | | The majority of candidates got the subtraction part of the calculation correct. Several candidates however failed to work out the percentage correctly. |
| c | | The majority of candidates answered this question correctly. Many however said the advantage of using pesticides is that they can kill bacteria. Some listed the fact that pesticides could harm the fish as the main disadvantage. |
| d | i | The majority of candidates answered this question correctly. |
| | ii | The majority of candidates answered this question correctly. |
| Question 3 | | |
| a | i | The majority of candidates answered this question correctly. |
| | ii | The majority of candidates answered this question correctly. |
| | iii | The majority of candidates answered this question correctly although many said that water makes the blood fluid and thus prevents clotting. |
| b | i | The majority of candidates answered this question correctly. |
| | ii | The majority of candidates failed to describe an adequate method for comparing the rate of water uptake. Very few candidates referred to the fact that the shoots should have a similar surface area. No reference to acclimatisation was made. Many candidates referred to the introduction of an air bubble in the capillary tube and that readings should include a measurement of the distance moved by the bubble. Many candidates said that the apparatus should be set up in a humid environment without describing how a humid environment could be created. |
| c | i | Many candidates said that mineral ions are absorbed along with water by osmosis. |
| | ii | The majority of candidates answered this question correctly. |
| d | | The majority of candidates answered this question correctly. Some candidates said that plants adapted for living in dry habitats have a waxy cuticle without emphasizing that this is thick. |
| e | i | The majority of candidates referred to the fact that the walls of capillaries are thin/only one cell thick. The majority of candidates referred to the fact that capillaries have a large surface area. |
| | ii | The majority of candidates said that tissue fluid allows the exchange of material between the capillaries and the tissues. |
| | iii | The majority of candidates said that oxygen moves from capillaries to muscle tissue because the latter requires oxygen for respiration and that carbon dioxide moves from the tissue to the blood to be eventually exhaled from the lungs. Few referred to the relative concentrations of oxygen and carbon dioxide in the tissues and capillaries. |
| Question 4 | | |
| a | i | The majority of candidates said that carbohydrate digestion starts in the mouth while protein digestion starts in the stomach. Many candidates went on to say that digestion continues in the intestines. A considerable number of candidates said that digestion continues in the ileum. Several candidates made correct reference to the enzymes involved in the digestion of carbohydrates and proteins. |

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| | | Few candidates referred to the fact that different enzymes have different optimal pH values. |
| | ii | The majority of candidates referred to the various functions of the liver and said that the liver has a different blood supply compared to other organs because of its important role. Few candidates referred to the hepatic artery or the hepatic portal vein. |
| | iii | The majority of candidates answered this question correctly. |
| | iv | The majority of candidates answered this question correctly. |
| b | i | The majority of candidates answered this question correctly. |
| | ii | The majority of candidates answered this question correctly. |
| | iii | The majority of candidates answered this question correctly. However some candidates incorrectly suggested that identical twins arise when two sperm cells fuse with a single ovum. |
| Question 5 | | |
| a | | The definition for the term <i>ecosystem</i> was generally incomplete. In many cases the answer was totally incorrect. Many candidates omitted to refer to the interaction between the biotic and the abiotic component. Many more omitted to mention the idea of energy flow and cycling of matter. |
| b | i | Generally correct and in line with the marking scheme. Marks were principally lost when candidate failed to mention the leaching/seeping of nitrates through the ground until they reach the ground water. |
| | ii | Generally correct. One needs to point out the fact that in many cases the language and expressions used were indicative of very poor command of both English and Scientific language. Candidates seem to prefer using 'animals go' rather than 'animals migrate' to mention one. In the opinion of the examiner the ability of expression is getting weaker by the year. |
| | iii | Generally correct even though in many cases incomplete. Marks were lost when candidates failed to link together precipitation/evaporation with the changes in salinity. Worryingly a significant number of candidates referred to salinity as a factor which changes of its own accord and omit the strong correspondence with water levels. Another point of concern is again the general inability to use simple phrases with the correct scientific terms in place and instead use expressions like 'the sun evaporates water' or 'the sun absorbs or takes water' which are totally unacceptable. |
| c | i | A significant proportion of marks was instead lost in this part. Very few candidates linked properly the decrease in carbon dioxide levels with photosynthesis and the increase in plant growth. The biological processes and thinking used were generally poor and of low standard indeed. Only a handful of candidates managed to link photosynthesis, production of glucose and its use in respiration to provide energy necessary for growth or for the production of new tissue. It seems that candidates are still very easily taken aback by questions involving a certain degree of application. |
| | ii | Generally incomplete as most candidates failed to mention that decomposition releases carbon dioxide. The examples given in response to organisms responsible for decomposition were generally correct. |
| | iii | Generally incomplete. The examiner was asking for a description and not merely a mention of one activity. Hence a complete answer is 'combustion of fossil fuels' and not simply 'use of fossil fuels'. A significant portion of the candidates made reference 'to driving a car', hardly an acceptable answer as it shows an inability to link fossil fuels with release of carbon dioxide. |

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| d | | Generally incorrect. Very few candidates obtained half or full marks in this part. It seems that the majority of the candidates is under the incorrect impression that an effect of the thinning of the ozone layer is an increase in global warming. The scientific reasoning behind this statement is totally incorrect. The thinning of the ozone layer allows more UV light to reach the planet's surface causing mutations, cataracts, melanoma and other skin conditions etc.... Global warming is mainly concerned with the trapping of IR radiation in the atmosphere leading to an overall increase in temperature with all its consequences. The ozone layer does not affect in any way the IR levels whether it is intact or not. |
| Question 6 | | |
| a | i | Generally correct with a significant proportion of candidates omitting some parts to the answer. The examiner points out however the incorrect reference in a worrying number of scripts about the 'movement of neurons' rather than the transmission of a nervous impulse. |
| | ii | Very few candidates made reference to the speed of impulse transmission. Even fewer mentioned the quick synaptic transmission between neurons as the major reasons behind the short time lapse between the stimulus and the response. The answers given were not in the least anywhere close to the marking scheme. |
| | iii | Very few candidates mentioned that the endocrine glands are effectors. The majority made reference to the secretion of hormones as a response awarding them half the marks allotted. The correct and proper use of terminology is imperative in the scientific formation of the candidates. |
| b | i | Very few candidates linked together the evaporation of sweat from the skin surface with the absorption of heat energy from the body thus providing a cooling effect. Many answered incompletely by stating that sweat evaporates cooling the body, omitting the proper reason. |
| | ii | Generally correct. No major points to comment about. |
| | iii | Generally incomplete. Candidates gave a possible effect: hypothermia or hyperthermia, but failed to explain clearly the danger of these in the denaturation or deactivation of enzymes (depending on the effect) and thus the lowering of metabolic activity, etc.... |
| c | i | Generally correct. Candidates failing to obtain full marks, gave incomplete answers as they did not clearly describe the changes occurring inside the shoot. The examiner would like to point out, once again, the general inability to use proper terms involving the movement of molecules: molecules migrate or are transported, but definitely molecules do not move or walk or go anywhere! Another point is that plants grow toward or away from a stimulus and do not go or flee from it. |
| | ii | Very few candidates made a reference to an equal distribution of auxin in all areas of the shoot. The majority of candidates were awarded one mark for the direction of growth (upwards) only. Oddly enough candidates scoring good marks in the previous part could not relate and link the knowledge with this second part and hence lost a significant proportion here. |
| | iii | Generally incomplete. It seems that the majority of the candidates failed to understand the question correctly. Many explained why chlorophyll is important whereas the question is also about the relevance of the observation reported in it. Very few candidates stated that chlorophyll production is stimulated by the presence of light. |
| | iv | Many candidates failed to realise that the question had two parts: 1) about the type of response and 2) the give a reason. Shockingly a number of candidates gave the answer in terms of the shoot rather than the root. |
| Question 7 | | |
| a | i | Generally correct. No major points to comment about. |
| | ii | Generally correct. |
| | iii | Generally correct for the insect, the myriapod and the arachnid. The reason for choosing 'crustacean' for organism D were in the majority of cases incorrect as the feature mentioned was not typically crustacean, like the presence of the |

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| | | exoskeleton (the answer adopted by the majority). |
| b | i | Generally incorrect as the majority made reference to hibernation. |
| | ii | Generally correct. No major points to comment about. |
| c | i | Generally incomplete and partially incorrect. Candidates made reference to breathing which is typically mammalian due to the presence of lungs. Many referred to the spiracles as the respiratory surface or the site of gaseous exchange; clearly incorrect. Very few mentioned that they are the openings of the tracheal system or that they close to prevent water loss or that they allow the entry and exit of oxygen and carbon dioxide respectively. |
| | ii | Generally incomplete with respect to the body parts where spiracles are situated. Candidates omitted either the thorax or the abdomen Generally incorrect in identifying the exact place, that is 'both sides' of the above mentioned body parts. Many said under the wings, on the legs, on the head, etc... |
| | iii | Generally correct. |
| | iv | Generally correct. |

PAPER 2B – comments

General Comments:

Candidates were unable to express themselves properly mainly due to their poor command of the English language. This was strongly evident in answers where candidates were expected to write a short paragraph such as in question 4.

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| Question 1 | | |
| a. | | Several candidates did not keep to criteria suggested by question i.e the use of graph paper and the labelling of axes and bars. Some candidates drew a histogram rather than a bar chart. |
| b | | Most candidates were unable to identify the endotherm classes from the list of vertebrates given. |
| c | i | Mainly correct. |
| | ii | Answers to this questions were either incorrect or incomplete with candidates simply stating the change in the amount of oxygen in water without giving a reason why. |
| d | i | Several candidates described the organisms found in the first trophic levels as autotrophs/producers however many were unable to explain properly why producers occupy this trophic level in a food chain. |
| | ii | Too basic an answer was given to this question. |
| | iii | Mainly correct. |
| e | | A large number of candidates did not match the trophic level to the primary/secondary consumer in their answer but simply wrote down second and third trophic level. |
| f | | Few candidates gave complete correct answers to this classic question. Several gave one correct way of why energy is reduced from one trophic level to another. |
| Question 2 | | |
| a | i | Mainly correct for naming kingdom. Several incorrect answers with candidates giving mammals as their reply for phylum of sloths. The term mammals was referred to in the initial text of the question. |
| | ii | A variety of correct characteristics were given by candidates the most common being having hair or fur. |
| b | i | Most candidates attempting question 2 did not answer this question. There were very few partially correct answers. |
| | ii | Candidates copied correctly the relevant portion of text of question b. |
| c | i | Some candidates still define a habitat as the place where an <i>animal</i> lives. |
| | ii | Mainly correct although some candidates gave a general answer such as trees. |

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| d | i | A number of candidates were able to apply their knowledge of herbivore digestion to this question and answer correctly. |
| | ii | Few candidates gave detailed replies. Many suggested that this is a mechanism to facilitate the digestion of food. |
| e | | Very few full answers. The majority of candidates gave few carbohydrates digested as their answer. |
| f | i | There were a large number of incorrect answers to this question. |
| | ii | Candidates were unable to differentiate between behavioural and physiological methods of temperature control. |
| Question 3 | | |
| a | i | Mainly incorrect. Several candidates inaccurately gave the function of water in cytoplasm for cell turgidity. |
| | ii | Again some candidates erroneously stated that water in blood plasma liquefies blood. |
| b | i | Most candidates wrote a vague procedure without referring to the correct method. Practical precaution of attaching capillary tubing under water was hardly mentioned by candidates. |
| | ii | Several candidates correctly stated that wind increases the rate of transpiration but very few candidates gave a valid reason for this answer. |
| c | i | Some candidates named and explained well the process by which mineral salts are absorbed from soil. Few described the passage of ions in the plant. |
| | ii | Mainly correct. |
| d | | Several candidates were able to give at least one suitable answer to this question. |
| e | i | Some correct answers. |
| | ii | Several candidates did not attempt this question. |
| | | Mainly incorrect. Several candidates inaccurately gave the function of water in cytoplasm for cell turgidity. |
| Question 4 | | |
| a | i | Several candidates mentioned the change into puberty as the boy develops. Few explained that the growth of facial hair is a secondary sexual characteristic. |
| | ii | Many candidates explained correctly the difference in the characteristic speed of nervous and endocrine messages. Only a small number of candidates gave valid reasons why there is a difference in speed. |
| | iii | Answers highlighted misunderstood concepts of the origin of identical and fraternal twins. |
| b | i | Many candidates did answer that carbohydrate digestion starts in the mouth but failed to mention the importance of salivary amylase and that this type of digestion continues in the duodenum. |
| | ii | Certain candidates stated the presence of duct glands in the human body. Very few gave examples. |
| | iii | Some candidates gave at least one factor affecting photosynthesis other than the intensity of light. |
| Question 5 | | |
| a | i | Most candidates were aware that the binomial system is universal and thus avoids confusion. Reference to evolutionary relationships was never encountered. |
| | ii | Often correct. The idea of segments, jointed body and presence of exoskeleton was often known amongst the candidates. |
| | iii | Some candidates confused the arthropod group with the actual names of organisms. The most confused characteristic was that of crustaceans where the majority of candidates answered 'hard exoskeleton'. |
| b | i | Most common answer: 'to breathe'. Often candidates failed to explain the gas exchange process i.e. the mentioning of O ₂ and CO ₂ . Prevention of water loss was rarely mentioned and a reference to the tracheal system was rare in Paper B. |

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| | ii | Often correct. |
| | iii | Sometimes correct. |
| Question 6 | | |
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| a | i | Reference to the use of fertilisers (and sometimes sewage) was often done. Some candidates though, failed to describe HOW these nitrates end up in ground water i.e. the run-off and seeping through rocks. |
| | ii | Often correct. |
| b | i | Often correct though lacked detailed and 1 mark was deducted for this. Eg. Have beak (omitted toothless), have wings (omitted forelimbs modified), lay eggs (omitted hard shelled). |
| | ii | Parallel veins often correct. Often fibrous and tap roots were confused. Adventitious roots never mentioned, scattered vascular bundles very rarely observed. |
| | iii | Often incorrect as the candidates failed to realise that the question was about the 'flower' of monocots and dicots. |
| c | i | Breakdown of dead organic matter often correct. Nearly always, the release of CO ₂ was omitted. |
| | ii | Use of cars was common answer in paper B. This was considered incorrect when no reference to fossil fuels was made. |
| d | i | Glucose often mentioned. |
| | ii | Very confused ideas emerged. A description of a greenhouse was considered incorrect. |
| | iii | Climate change with reference to the melting of the polar ice caps was the most common answer encountered. Increase risk of skin cancer was also a common answer. It is suggested that candidates are exposed to other environmental issues related to the thinning of the ozone layer. |
| Question 7 | | |
| a | i | Very often the descriptions are incorrect because candidates find difficulty in describing and giving the necessary detail. For example receptors; 'where the stimulus is found'. Sometimes candidates provided drawing of a reflex arc but failed to give a description as required by the question. |
| | ii | 'involuntary' action is most often given |
| b | i | Sweat evaporates from the skin is often known but that heat energy is carried away from the body is often omitted. |
| | ii | Vasodilation rarely mentioned. Hairs relax is sometimes given. |
| | iii | Often candidates explained that 'heat is trapped' by the fat in the skin. This is not an accurate description. |
| c | i | Shoots bend towards the light often correct but the term 'phototropism' often is omitted. |
| | ii | The mechanism of auxins very often unknown. |
| d | i | Correct |
| | ii | Sometimes 'chloroplasts' and 'chlorophyll' are exchanged. |
| Question 8 | | |
| a | i - iii | Wind seed dispersal was sometimes correct though confusion with wind pollination was often encountered. A description of the way seeds are moved by the wind and their abundance was never encountered. However, the idea of competition was sometimes mentioned. |
| b | i - iii | The term 'shivering' was not often mentioned by the candidates. |
| c | i - iii | The term vegetative propagation was never encountered. More often candidates referred to cloning. This was not considered correct. However, often the candidates referred to the asexual process of reproduction. |

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| d | i - iii | Very confusing answers were encountered here. The term 'geotropism' was very rarely encountered. |
| e | i - iii | Hunting was commonly observed in this question. Very often candidates explained that the predator hunts for the prey to get food. This was awarded marks. However, the relationship between predator and prey and their populations were never encountered. |

Chairperson
2013 Examination Panel