Aga Khan University Examination Board
Notes from E-Marking Center on SSC II Biology Examination
May 2013

Introduction

This document has been produced for the teachers and candidates of the SSC Part II (Class X) course in Biology. It contains comments on candidates' responses to the 2013 Secondary School Certificate (SSC-II) Examination, indicating the quality of the responses and highlighting their relative strengths and weaknesses.

This document should be read along with the AKU-EB Biology Examination syllabus based on the National Curriculum (2006).

General Comments

Teachers and candidates should be aware that examiners may ask questions that address the Student Learning Outcomes (SLOs) in a manner that requires candidates to respond by integrating knowledge, understanding and application skills they have developed by studying the course.

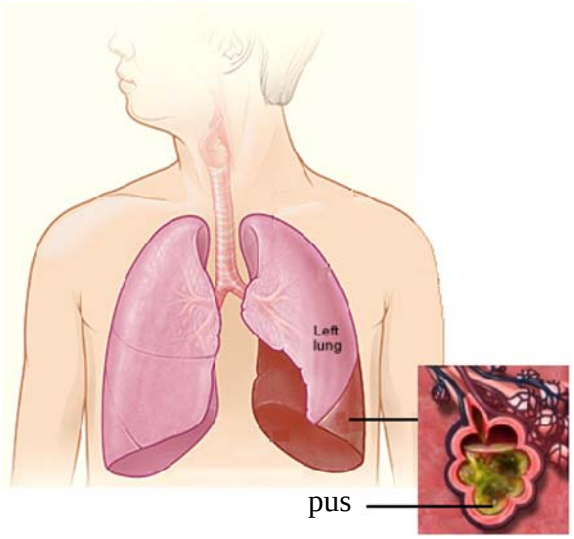
Candidates need to be aware that the marks allocated to the questions are related to the answer space provided on the examination paper as a guide to the length of the required response. A longer response will not in itself lead to higher marks. Writing far beyond the indicated space may reduce the time available for answering other questions.

Candidates need to be familiar with the command words in the Student Learning Outcomes which contain terms commonly used in examination questions. However, candidates should also be aware that not all questions will start with or contain one of the command words. Questions such as 'how?', 'why?' or 'to what extent?' may also be used.

Detailed Comments:

Question 1

The diagram shows the lungs of a patient suffering with one of the respiratory diseases.



a. Identify the disease and state its cause.
b. State any TWO symptoms that the patient might be displaying.

Better responses wrote the correct name of the disease along with its causative agent. Most of the candidates wrote two correct symptoms.

Average responses identified the disease correctly but failed to write about its causative agent. Such responses gave one correct symptom instead of two.

Weaker responses were unable to identify the disease in the given picture. Most of the candidates identified the disease as emphysema. Some of the candidates wrote lung cancer or asthma as well. Instead of giving a precise answer, some candidates named all the groups of microorganisms as the causative agent like bacteria, virus and fungi. Few candidates identified smoking as the causative agent of the disease shown in the diagram.

Question 2a

What happens to carbon dioxide in plants in daytime and at night?

Better responses showed a clear understanding of the question and wrote about the fate of carbon dioxide in plants i.e. at day time it is utilized in the process of photosynthesis/ to make glucose while at night it is given out in the environment by diffusion.

Average responses showed misconception about carbon dioxide being used up in photosynthesis. They wrote that it is given up in the environment as a result of respiration during both day and night.

Weaker responses wrote about the process of photosynthesis in plants. This showed that such candidates are more inclined towards rote memorization rather than conceptual understanding of the topic.

Question 2b

Draw a ray diagram to show how long sightedness can be corrected using a lens.

Better responses drew the accurate shape of the lens with correct representation of image formation on retina.

Average responses either drew correct shape of the lens or the position of image on retina.

Weaker responses mixed up the treatment of long sightedness with short sightedness and drew concave lens instead of convex lens. Some candidates made mistake in image formation i.e. they showed it either behind retina or before retina.

Question 3

What is antagonism? Why are biceps and triceps considered as the antagonistic muscles?

Better responses defined the term ‘antagonism’ correctly. They also described the movement of biceps and triceps using appropriate key terms i.e. contract/ relax/ arm pulled up/ arm pulled down.

Average responses described the movement of biceps and triceps but failed to indicate the state of the arm in each case.

Weaker responses just defined antagonism without justifying biceps and triceps as antagonistic muscles.

Question 4a

Why is stem cutting considered as an **artificial** and **vegetative** method of propagation in plants?

Better responses fulfilled both the requirements of the question. Candidates correctly mentioned the reason of vegetative propagation that plants reproduce through stem which is an asexual part and as is done through human intervention it is considered as an artificial method.

Average responses showed description of any one aspect of the question. Most of the candidates attempted the reason for artificial propagation but were unable to give the reason for the method being vegetative.

Weaker responses wrote detailed explanation or method of stem cutting instead of giving the required reasons.

Question 4b

Why is the flow of energy considered as non-cyclic in an ecosystem?

Better responses correctly explained the concept of flow of energy as non-cyclic i.e. when energy flows from one trophic level to another most of it is lost in the environment as heat which cannot be used again. Living organisms at each trophic level lose energy through metabolic activities such as respiration, digestion etc.

Average responses wrote about loss of heat energy but did not give proper description about its non-cyclic nature. Some of the candidates wrote that energy can neither be created nor be destroyed but failed to correlate it with ecosystem.

Weaker responses wrote that energy is transferred from the sun to the environment without explaining the concept of loss of energy. Few candidates drew food chains with explanation.

Question 5

The given picture shows the habitat of butterflies of two different colours. One variety of butterflies appears more in number than the other.

Describe the phenomenon responsible for this discriminating survival.

Better responses gave complete answer including phenomenon i.e. natural selection/ survival of the fittest and described the significance of colour i.e. camouflage with the environment. In this way, they are safe from the predators and thus are more in number.

Average responses wrote incomplete description. Such responses identified the phenomenon. The also wrote that one variety increases in number but failed to mention the reason or the role of predators.

Weaker responses misunderstood the stimulus and identified it as variation/ genetic make up/ deforestation and thus ended up with wrong description.

Question 6a

State any TWO objectives behind the implementation of genetically engineered organisms.

Better responses wrote a wide range of correct objectives behind the implementation of genetically engineered organisms. For example, in the field of medicine for the preparation of vaccine, growth hormone, insulin and urokinase for humans. In plants for the production of

herbicide/ pesticide resistant varieties. Some of the responses wrote that it is used in the preparation of single cell proteins and in controlling environmental pollution.

Average responses were unable to mention two objectives behind the use of genetically engineered organisms.

Weaker responses wrote method of genetic engineering. Some of the responses gave examples of biotechnology like bread making/ wine making/ yogurt making.

Question 6b

What physiological changes occur in the body of a person taking hallucinogens? Mention any THREE.

Better responses wrote a wide range of physiological changes such as dilation of pupils/ constriction of some arteries/ rise in blood pressure/ increased heart rate.

Average responses gave any two physiological changes instead of three.

Weaker responses did not focus on the changes related to the use of hallucinogens. These responses wrote generalized effects like dizziness or drowsiness/ body fatigue/ improper functioning of the body/ loss of appetite.

Question 7a

Explain the process of the two types of dialysis carried out in case of kidney failure.

Better responses showed clear understanding of the command word of the question. Such responses described both the methods of dialysis using the key terms. Moreover, these responses included composition of the dialyzing fluid and its working.

Average responses gave appropriate description of haemodialysis but in case of peritoneal dialysis they missed out the function of peritoneum and also failed to write the composition of the fluid.

Weaker responses wrote quite general responses like both the methods take place in case of kidney failure. They provided incomplete description of haemodialysis mentioning that the dialyzer consists of semi-permeable membrane but failed to give its function. Most of the candidates were unable to write the description related to peritoneal dialysis.

Question 7b

Think of an example of a reflex action from your daily life. Describe the events/changes taking place from the time you sense it till the point you respond to it.
(Your answer should also include the complete pathway of nerve impulses.)

Better responses explained the phenomenon of reflex action with proper example of highlighting the correct pathway of nerve impulses using proper key terms. Such responses included maximum key terms like the use of stimuli, sensory neuron, receptors, relay neuron and their actions.

Average responses picked up appropriate examples from daily life but were unable to give full description about the pathway of nerve impulses. They used the terms as sensory neurons, motor neurons, effectors but missed out about relay neurons.

Weaker responses were unable to select a suitable example. They defined reflex action and involuntary action.

Question 8a

Describe the structural features which are found in a wind pollinated and an insect pollinated flower.

Better responses wrote differentiating features of both wind and insect pollinated flowers in terms of colour, nectar, shape of flower, size of anther and position of stigma.

Average responses provided only two or three differences. Some of them only wrote about either type of flowers.

Weaker responses gave description about pollination and its types. Some of them mixed up pollination with seed dispersal and wrote about the characteristics of seeds.

Question 8b

Describe how urbanization and acid rain cause harm to the ecosystem.

Better responses provide detailed description about the phenomena of urbanization and acid rain and its effects on the ecosystem.

Average responses wrote fewer effects on urbanization as compared to acid rain. Candidates wrote wrong description of urbanization and mixed up the concept of urbanization with population. Candidates missed the key terms rural to urban while describing urbanization.

Weaker responses gave generalized views highlighting the effects of population or pollution.