6116
Paper 2

Key messages

- Candidates should be given the opportunity to have access to the NSSC Biology syllabus since this is a document that guides the candidates on which topic to be covered and the assessment objectives that are assessed in the examinations.
- The syllabus should be consulted for the correct use of terminologies.
- Candidates should be aware that the command word of questions indicates how the candidate should respond. The word '**explain**' requires may imply reasoning or some reference to theory, depending on the context. It is another way of asking candidates to give reasons. The learner needs to leave the examiner in no doubt why something happens. With reference to **1 (a) (ii)** the candidates should give a reason why viral infections cannot be treated with antibiotics.
- Candidates should be made aware that using **or** and **/** when answering the questions is not permitted and will lead to candidates losing marks unnecessary.
- Candidates should be made aware to refrain from using laymen's language in class and rather stick to correct scientific terminology.

General comments

The majority of Centres have displayed that the definitions were not taught according to what is in the syllabus but from several textbooks and the internet. The spelling of biological terms needs serious attention with reference to meiosis, radial, circular muscles, foetus, and so on. It is of utmost importance that teachers use the teaching resources that are approved for the revised curriculum as certain information might have changed.

Comments on specific questions

Question 1

(a) (i) The stronger candidates identified parts labeled A and B in Fig. 1.1. The most common error was identifying A as protein coat.

(b) About fifty percent of candidates explained why viruses are sometimes considered as non-living. The most common error was stating the features which viruses do not have with reference to the cell membrane.

(c) (i) The majority of candidates were credited for describing two ways in which the spread of HIV by sexual intercourse may be controlled. The most common error is that the candidates stated prevent sharing of needles and blood transfusion which has nothing to do with sexual intercourse.

(ii) The minority of candidates gave reasons why viral infections cannot be treated with antibiotics. The most common errors were that candidates could not distinguish between a virus and viral infections.

(iii) The minority of candidates were able to explain the role of vaccination and that vaccination contains a weakened pathogen. The most common errors candidates could not further state that the lymphocytes and plasma cells and white blood cells produce antibodies, instead candidates stated that the body produces antibodies. Candidates are aware of memory cells however they could not state their functions.

Question 2

(a) The majority of candidates could not write the definition based on the syllabus. The most errors were misspelling the word catalyst as catalyse, catalistics and catalytic.

(b) About fifty percent of the candidates were credited for describing the test for protein. The most common errors were that candidates described starch test, reducing sugars test and fat test instead. Candidates also misspelled the word Biuret as Bulet, Burette and Burent.

(c) (i) Credit was awarded to candidates who stated the correct optimum pH. The most common error was stating the pH with units such as cm, mm and °C instead of referring to pH.

(ii) The majority of candidates were credited for naming the part of the alimentary canal in which enzyme X is most active.

(iii) Credits were awarded to candidates who stated reasons why enzyme X is only most active in the stomach and not in other parts of the alimentary canal. The most common errors candidates referred to the enzymes in general instead of referring to pepsin and protease. Candidates also referred to optimum temperature instead of optimum pH.

Question 3

(a) (i) The majority of candidates were credited for stating the function of lymphocyte. The most common error was stating that the lymphocytes provide and release antibodies instead of produce antibodies.

(ii) The majority of the candidates were awarded for stating the function of phagocyte. The most common error was to state 'destroy pathogens' instead of 'digest' and also switching digest and engulf instead of engulf and digest.

(iii) The majority of candidates were awarded for stating the function of the red blood cell. The most common error was stating that red blood cell transports oxygenated blood instead of oxygen.

(b) The minority of candidates were credited for describing the process of blood clotting. The most common error was that the candidates could not describe the process of blood clotting in sequence. Candidates also had difficulty in spelling the words scab and clotting correctly instead it was spelled as scarb, scub, scrub, and clothing, crotting and cloting.

(c) The minority of candidates were awarded for outlining the function of blood plasma. The most common error was that candidates listed the number of substances that are transported by blood and could not state other functions of the blood plasma.

Question 4

(a) The minority of candidates were able to describe how one named environmental condition affects germination. The most common error was stating the wrong environmental condition such as drought, rainfall, and wind and the correct effect.

(i) The majority of candidates were credited for naming the correct response shown by seedling in G.The most common error was that candidate misspelled phototropism as phototrapezium, photoprism and phototropic.

(ii) Many candidates were able to name the chemical substance responsible for the response shown by seedlings in G. The most common error was that candidates misspelled auxin as axin, axon and anxin.

(iii) Few candidates were awarded for stating what happened, the effect on the concentration of growth substance and the result. The most common errors was that the candidates focused on the effect of auxin rather than the effect of light on seedlings.
Candidates did not give reference to the concentration of growth substance for example seedling E, the most common answer was no growth instead of no auxin produced. For seedling G most candidates used the word higher, larger concentration of growth substance instead of greater and more.
Regarding the result for seedling F, candidates hardly linked the word elongation with cells.
Candidates also had difficulty in indicating which part of the seedling is growing, for seedling F candidates were required to indicate the direction of growth and then balance of growth for example equally upwards and evenly and longer.

Question 5

(a) (i) The majority of the candidates were credited for identifying the parts labelled R – U in Fig. 5.1.

(ii) Few candidates were awarded for defining reflex action according to the syllabus. Other candidates defined reflex action according to several textbooks and internet. This was accepted but, teachers are encouraged to give syllabus definitions during teaching.

(iii) The average number of candidates were credited for naming the two muscles of the iris that control the size of the pupil. There was confusion as some candidates stated the rods, cones, ciliary, suspensory ligament instead of circular muscles and radicle, contract and relax instead of radial muscles.

(b) Few candidates were credited for describing the effects of alcohol on the release of the neurotransmitter substances. The most common errors were candidates stated the socio-economic effects of alcohol abuse. Candidates referred to the effects of alcohol on the brain instead of the effects on the release of neurotransmitters. Candidates also could not distinguish between the physical reaction time and chemical reaction time.

Question 6

(a) The average of candidates was credited for naming the type of cell division which give rise to the sperm cell. Some candidates confused meiosis with mitosis. Candidates also misspelled meiosis.

(b) (i) The average number of candidates were awarded for naming the process P and structure Q. The most common error was that candidates referred to the zygote as an embryo. Candidates also described structure Q instead of naming zygote.

(ii) The majority of candidates were familiar with the morning-after pill , few referred to it as Plan B. Candidates also correctly mentioned the loop and IUD. However, candidates had difficulty in describing how the named contraceptive method prevent pregnancy. Some candidates stated implantation of the zygote instead of implantation of the **embryo**.

(c) (i) Few candidates were credited for outlining what happens to the embryo in the early stages and towards the end of pregnancy. Many candidates confused the order of embryonic development and did not specify when each development occurred either in weeks or months. Candidates referred to the embryo as a zygote and also stated that the embryo implants in the uterus wall instead of the embryo embeds in the uterus lining/ endometrium.

(ii) The average number of candidates were awarded for describing the role of the umbilical cord during pregnancy. Some candidates referred to the umbilical cord as an intestine. Candidates used the terms pass, passage, exchange and diffusion instead of transport.

Candidates referred to food being transported instead of nutrients, and waste substances were not specified as urea and carbon dioxide. Candidates also failed to specify the direction of transport from mother to placenta and vice versa.
Candidates referred to the foetus as an embryo, baby or child.
Some candidates referred to the mother as woman. Many candidates mentioned the placenta instead of uterus and switched the blood vessels: umbilical artery and umbilical vein.

Question 7

(a) (i) The majority of candidates were credited for naming the blood vessel M in Fig.7.1. The most common error was that the candidates referred the blocked artery as pulmonary artery, and some candidates refereed to coronary without indicating whether it is an artery or a vein.

(ii) The average number of candidates were credited for identifying L and M. The most common error was that candidates misspelled aorta as aortha, arota, arotra.

(iii) The majority of the candidates were awarded for naming a component of the diet that can cause a blockage in the blood vessel. The most common error was that candidates referred to fatty acids and glycerol.

(b) A number of candidates were credited for suggesting two ways in which a vein might not be as suitable for carrying blood to the heart muscles as blood vessel M before it was blocked. The most common error was that candidates switched the features for artery with vein.

(c) Few candidates were awarded for naming the two other surgical procedures that can be used to treat blocked blood vessels. Candidates displayed the lack of knowledge of surgical procedures. Candidates referred to aspirin as a surgical procedure and also candidates knew of the balloon inserted but failed to refer it as balloon catheter. Some candidates referred to the effects of cholesterol and how to prevent obesity which are not correct answers.

(d) The stronger candidates describe the function of the lymphatic system. The most common error was that the majority of candidates referred to the function of lymphatic system as production of lymphocytes. Candidates could not answer fully and mentioned body fluids instead of tissue fluids. Most of the candidates also stated the functions of neutrophils and antibodies instead.

Question 8

(a) The stronger candidates named the processes labelled W, X Y and Z in Fig. 8.1. The most common error was that candidates mixed up the processes, some candidates referred to process Y as ammonification/decomposition instead of death.

(b) The stronger candidates were credited for describing the possible effects of using nitrogen-containing fertilisers on the environment. The most common error was that the candidates describe the effects of acid rain and also some candidates describe eutrophication instead of describing the effects.

(c) The majority of the candidates were credited for stating the one human activity that is increasing the amount of carbon dioxide in the atmosphere. The most common error was that candidates stated burning only without referring to fossils.