

**QUESTION 1**

1.1 to 1.3 Answered fairly well

1.4.2 Candidates did not know the adaptations of a root hair which make it an efficient water-absorbing structure.

1.4.3 Candidates confused the process with the pathways. They also gave one-word answers, e.g. *cell wall*, instead of *along cell walls*.

1.4.4 Candidates could not link the structural adaptations to their functions, e.g. walls thickened or lignified to withstand pressure or force or pull.

1.4.5 Candidates did not follow instructions, nor did they indicate which label was correct or incorrect.

**QUESTION 2**

This question was answered very poorly.

2.1.1 The majority of candidates did not have mathematics as a subject and, as a result, they struggled with this calculation. Teachers should expose candidates to similar elementary calculations.

2.1.2 Candidates became confused and referred to *air* instead of *water vapour*.

2.1.3 Candidates could not apply their knowledge of transpiration in different environmental situations – they tended to confuse it with the setting up of the potometer apparatus.

2.1.4 Fairly well answered. Could deduce that water will stay inside.

2.1.5 Fairly well answered (if studied). Candidates had a fair knowledge of advantages of transpiration - cooling and transpiration pull, or absorption of mineral salts.

2.1.6 The majority were confused and drew a plasmolysed cell instead. Dorsal and ventral labels were not accepted.

**2.2 High-order question**

2.2.1 Fairly well answered. Many candidates struggled with the term *plasmolysis*.

2.2.2 Fairly well answered. Many candidates struggled with the term *plasmolysis*. Data response skills were not up to standard.

2.2.3 Very poorly answered. Candidates did not have insight into ways to increase accuracy, e.g. Using pieces from the same apple, or leaving apple pieces for longer in the solution.

2.2.4 Candidates must be told to write clear unambiguous answers so as not to lose marks. If asked *Which cell ...*, answer must be about the cell in Solution 2 and not about the solution itself.

2.2.5 Poorly answered. Candidates could not see that cell walls which were denatured or destroyed would leave them totally permeable to water, resulting in a loss of differential permeability (which allows water to diffuse in and out).

*Educators are not doing enough practical investigations at their schools. Also, candidates are not being exposed to diagrams and tables that allow them to develop their skills.*

### QUESTION 3

The question about the kidney was poorly answered. The majority of candidates could produce the drawing of the Malpighian body, but not describe the function or the structural adaptations.

- 3.1.2 Candidates confused *cuboidal* with *columnar epithelium*. Only a few candidates understood passive and active transport. The difference between the two and where it takes place must be emphasized by educators.
- 3.1.5 Candidates did not understand the structured adaptations, nor the importance of the podocyte cells in ultra filtration (having hairlike projections wrapped around capillaries to ensure closer contact or increased surface area).
- 3.2 The question about Martin being beaten after drinking heavily tests the candidate's reading and comprehension skills, as well as the ability to apply everyday life experiences. There was a lack of ability to read with comprehension and to apply knowledge about the function of the kidney in osmoregulation.
  - 3.2.1 With regard to the dehydrating effect of alcohol on the body and its inhibiting effect on the secretion of ADH and osmoregulation, the relationship between excretion and endocrine systems must be emphasized.
  - 3.2.2 Candidates did not know that damaged kidneys cause internal bleeding and, in turn, darker urine.
  - 3.2.3 Swelling as a result of the retention of tissue fluid should be common knowledge in Grade 12.

Teachers must emphasize the link between structures and their functions, as well as what will happen when these structures are damaged.

### QUESTION 4

- 4.1
  - 4.1.1 Well answered. Candidates could identify the parts of the ear.
  - 4.1.2 to 4.1.4 Poorly answered. Candidates did not know the function of a *grommet* and therefore they struggled to answer these questions. When teaching the organs, teachers must incorporate knowledge from everyday life situations – not just textbook functions and structures.
- 4.2 Poorly answered. Candidates could not interpret the table given.
  - 4.2.1 (i) Fairly good
  - (ii) Poorly answered. Candidates could not see that the pupil dilates – they mentioned the eyes become bigger or that the pupil is higher.
- 4.2.2 Poorly answered. Candidates confused *ciliary muscles* and *circular muscles*, also *eye accommodation* and *pupil mechanism*.

- 4.3 The questions were well structured, but the diagram was unfair because most candidates knew the pituitary gland as the hypothalamus, which was omitted in the diagram.
- 4.3.1 Poorly answered. Candidates could not explain homeostasis, they were referring to endothermic body temperature instead.
- 4.3.2 Poorly answered. Candidates could not give the difference between the effect of a hormone being slow in response and long lasting and an impulse responding rapidly and being short-lived.
- 4.3.3 Candidates confused hormones ADH and TSH.
- 4.3.4 Questions (i) and (ii) on the thyroid and its function were answered very well. Candidates occasionally confused it with the pancreas and its hormonal function.
- (iii) Answered reasonably well. Candidates mentioned the function of the thyroid instead of TSH.
- (iv) It was a difficult question for SG. They first had to think about metabolism and then functions that were not metabolic. Most candidates referred to glucose and insulin.

## QUESTION 5

- 5.1.1  
to 5.1.3 The majority of candidates knew the structure of the skin and how the capillaries and erector muscle react when exposed to a cold environment.
- 5.2.1 Candidates are still using *warm* and *cold-blooded* when referring to endothermic animals. Teachers must emphasize that these terms are no longer accepted.
- 5.2.2  
and 5.2.3 Graph interpretation skills were lacking in many candidates.
- 1.2.4 Candidates' knowledge of thermoregulation was lacking.
- 5.3.1  
and 5.3.2 Candidates tended to confuse *reflex arc* and *reflex action*.
- 5.3.3 The question confused the candidates. They did not read properly – neurons were given, but not in the correct sequence.
- 5.3.4 Most candidates knew what a synapse was.
- 5.3.5 Candidates evidently have problems with terminology. They confused *stimulus* with *effector*. They often referred to *finger* instead *the muscle* as the effector.