

## ANALYSIS OF POORLY PERFORMED QUESTIONS

The questions that were performed poorly by the candidates are discussed below.

### 3.3.2 Biology Paper 1 (231/1)

#### Question 1 (a)

What is meant by the term wilting?

(1 mark)

#### Weakness

Most candidates could not bring out the fact that the rate of water loss is higher than absorption, leading to drooping/drying. Some stopped at the rate of water loss is higher than absorption and left out drooping/drying in their responses.

#### Expected responses

Is when the rate of water loss is more than the rate of absorption and the plant droops;

#### Question 1 (b)

Explain how an increase in temperature affects the rate of active transport.

(2 marks)

Most candidates correctly understood that increase in temperature leads to an increase in the rate of transpiration. However, they failed to add that further increase in temperature slows down and finally stops active transport because enzymes are denatured.

#### Expected responses

The rate of active transport increases with increase in temperature up to the optimum temperature;

Further increase in temperature slows down the rate of active transport until it stops because it denatures enzymes;

#### Question 18

How is the human sperm cell structurally specialised?

(2 marks)

#### Weakness

Most candidates were not able to frame their responses correctly. They stated that a sperm has a **tail**, **mitochondria** instead of stating **long tail** and **numerous mitochondria** as the adaptation features.

#### Expected responses

- Acrosome/Lysosome contain enzyme to digest membrane of the ovum;
- Numerous mitochondria to provide energy for movement;
- Long tail for faster movement;

**Question 21(b)**

What is meant by the term organic evolution?

(1 mark)

**Weakness**

Most candidates stated that the present/new life/species/organisms emerged from pre-existing life forms. They left out the fact that they are complex life forms and that it occurs over a long period of time.

**Expected responses**

Emergence of new life/species/organisms from pre-existing simple forms, gradually over a long period of time, to present complex forms;

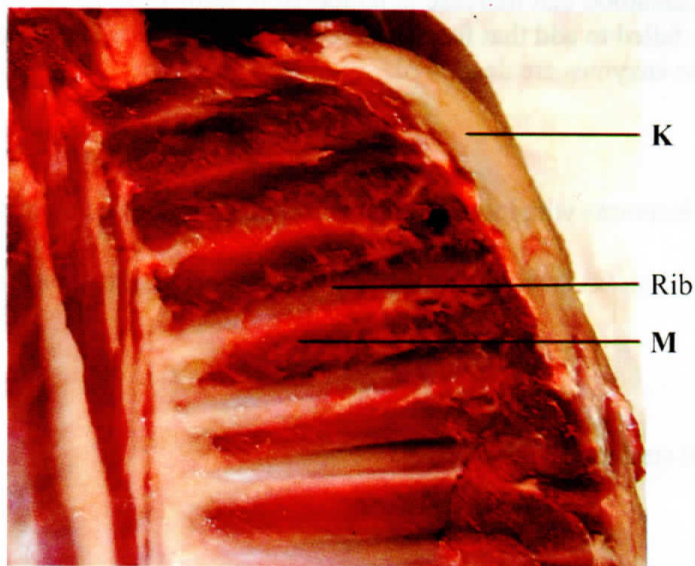
**3.3.3 Biology Paper 2 (231/2)**

No difficult questions were reported in this paper

**3.3.4 Biology Paper 3 (231/3)**

**Question 1(a)**

(a) The photograph below shows the inner surface of the upper left side of the rib cage.



- (i) Name the bone covered by the fatty tissue labelled **K**. (1 mark)
- (ii) Explain the role of the part labelled **M** in inhalation. (5 marks)

**Weaknesses**

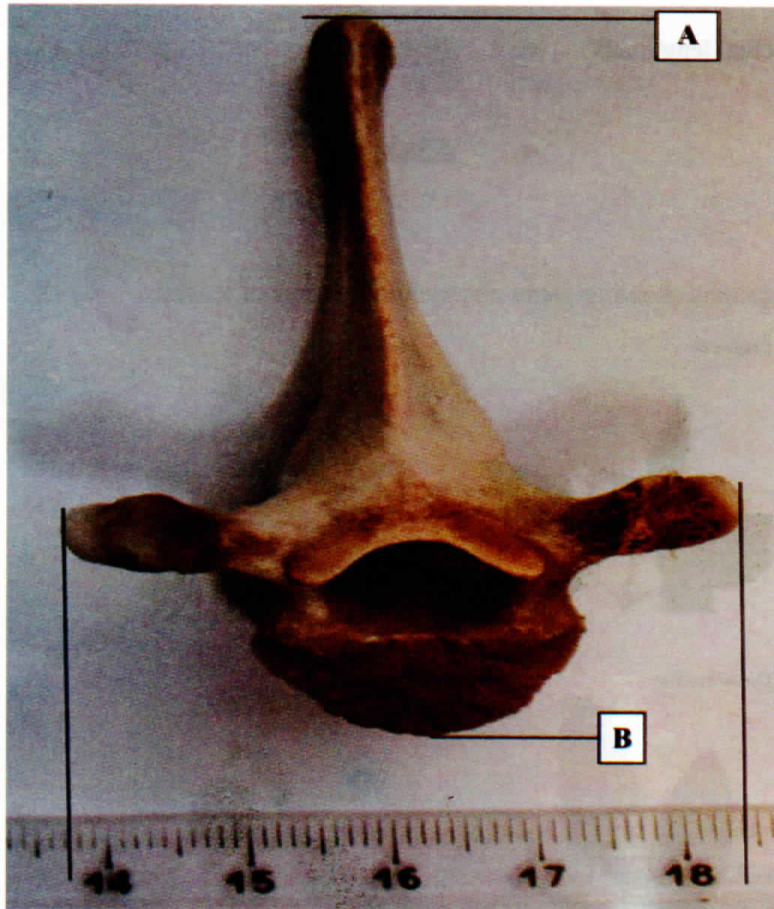
Most candidates were not able to identify the sternum. This could be associated with the inability to correctly interpret the stem of the item and the picture. They were also unable to explain the role of internal intercostal muscles during inhalation.

**Expected responses**

- (i) Sternum;
- (ii) The internal intercostal muscles relax; pulling the ribs upwards; and outwards; This increases the volume of the rib cage while pressure decreases; Forcing air into the lungs;

**Question 1(c)**

- (c) The actual width of the vertebra below in cm is shown by a section of the ruler in the photograph.



- (i) Determine the width of the vertebra on the photograph. (1 mark)
- (ii) Calculate the magnification of this image. (2 marks)
- (iii) Determine the actual length of the vertebra from point A to B. Show your working. (2 marks)

**Weaknesses**

Most of the candidates failed to link the item to magnification in form one. The few who did were unable to appropriately apply that knowledge to the tasks in this item. Some used their knowledge in mathematics to respond to the item.

### Expected response

(c) (i) Image width = 9.8 cm;

(ii) Magnification =  $\frac{\text{Image length / width}}{\text{Actual length / width}}$  ;

=  $\frac{9.8 \pm 0.1}{4.6 \pm 0.1}$

Mg =  $\times 2.13$  ;

(iii) Actual length AB =  $\frac{10.4 \pm 0.1}{2.13}$  ;

= 4.8826 cm ;

### Question 3

3 Below are photographs showing some observable features of leaves.

*Compositae*



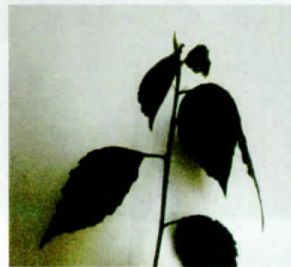
*Papilionaceae*



*Commelinaceae*



*Malvaceae*



*Nyctaginaceae*



*Bignoniaceae*



Using the features in the order given below, construct a dichotomous key that can be used to identify the specimens.

- simple or compound leaves;
- leaf venation;
- leaf margin;
- arrangement of leaves on the stem;
- pinnate or trifoliate nature of leaves.

(10 marks)

### Weaknesses

Most candidates were unable to construct the dichotomous key to identify the plant specimens illustrated. They expected to be given a key not to construct one. This could be an indication of teaching to the test instead of teaching the syllabus.

### Expected response

- |    |     |   |                        |
|----|-----|---|------------------------|
| 1. | (a) | Simple leaves .....                       | go to 2;               |
|    | (b) | Compound leaves .....                     | go to 4;               |
| 2. | (a) | Leaves net-veined/reticulate .....        | go to 3;               |
|    | (b) | Leaves parallel veined .....              | <i>Commelinaceae</i> ; |
| 3. | (a) | Leaves with serrated margins .....        | <i>Malvaceae</i> ;     |
|    | (b) | Leaves with smooth (entire) margins ..... | <i>Nyctaginaceae</i> ; |
| 4. | (a) | Leaves opposite .....                     | go to 5;               |
|    | (b) | Leaves alternate .....                    | <i>Bignoniaceae</i> ;  |
| 5. | (a) | Leaves pinnate .....                      | <i>Papilionaceae</i> ; |
|    | (b) | Leaves trifoliate .....                   | <i>Compositae</i> ;    |

### GENERAL ADVICE TO TEACHERS

Questions involving application of knowledge were poorly performed by candidates compared to those that required factual knowledge. This could be a likely indication that the instruction should go beyond mere transfer of factual information.

Questions involving biological processes were equally performed poorly. Some candidates had the points to build up the processes but could not put them down coherently. The points were not flowing as per the requirements of the biological procedure in question. This could be an indication that these candidates had simply memorized the points and therefore could not use them to build the biological process in the task.

The syllabus should be covered adequately to enable students to have a clear grasp of the content. All the suggested activities should be covered practically for the candidates to internalize the scientific concepts behind them.

The technical words used in biology should be fully embraced and candidates adequately exposed to their use in their scientific communication. Use of correct biological terms with correct spelling should be emphasized during teaching.

Finally, all the biology topics in the syllabus are tested by the three papers. Teachers should therefore ensure that all the topics are adequately covered during teaching. All content areas should be equally emphasized during instruction. There should be no discrimination on the basis of past biology examination papers. The content area you think is never tested could be in the next test paper. Let us prepare our candidates adequately.