

EXAMINATIONS COUNCIL OF ZAMBIA

Joint Examinations for the School Certificate
and General Certificate of Education Ordinary Level

BIOLOGY

5090/6

PAPER 6

Alternative to Practical

Wednesday

29 OCTOBER 2014

Additional materials
Answer paper
Diagram Booklet

PRINT VERSION OF BRAILLE PAPER

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number on the answer paper.

There are **three (3)** questions in this paper.

Answer **all** questions.

Write your answers on the answer paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

Answer all questions

1 An experiment was set up to investigate the effect of light on the growth of two coleoptile tips of seedlings **A** and **B**. Seedling **A** had one centimetre length of its coleoptile tip removed, while seedling **B** was left with its coleoptile tip. Both seedlings were then exposed to light from one direction for eight hours. It was observed that seedling **A** continued growing upright while seedling **B** bent towards the source of light.

(a) (i) Describe what happened to the coleoptile tips in;

Seedling **A** [1]

Seedling **B** [1]

(ii) Give reasons for the observed growth pattern in;

Seedling **A**
..... [1]

Seedling **B**
..... [3]

(iii) Name the growth response being investigated in the experiment.

..... [1]

(iv) Name the hormone involved in this type of growth.

..... [1]

(v) Name the two parts of the plant where the hormone is produced.

..... [2]

(b) Investigations were also carried out on the effect of light on the growth of roots in seedlings. It was observed that roots grew away from the source of light.

(i) Give reasons for this observation.

.....
.....
..... [2]

(ii) State the conclusion on the effect of the hormone on the growth of shoots and roots.

Effect on roots..... [1]

Effect on shoots..... [1]

[Total 14]

2 An Amoeba and a palisade cell of a leaf were placed in the same test tube containing a solution of a higher concentration than the cells. The cells were left in solution for a period of ten minutes and later examined through a microscope on a glass slide.

(a) (i) Describe the shape of cells as observed under a light microscope

1. Palisade cell [1]

2. Amoeba cell [1]

(ii) Give reasons for the cell shapes observed in the cells examined.

1. Palisade cell [1]

2. Amoeba cell [1]

(iii) What process is responsible for the results in (a) (i) above.

..... [1]

(iv) Name the part of the cell that controls the process named in (a) (iii) above.

..... [1]

(v) State the importance of this process in the life of a plant.

1. [1]

2. [1]

(b) The two cells were removed from the concentrated solution and thoroughly washed with distilled water. The two cells were later put in ordinary distilled water for a period of fifteen minutes. The cells were later examined through under a light microscope.

(i) Describe the shape of cells observed under the light microscope.

1. Palisade cell [1]
.....

2. Amoeba [1]
.....

(ii) Give a reason for the cell shape of the amoeba in (b) (i) above.

..... [1]

(iii) State the major function of palisade cells in plant leaves.

..... [1]

(iv) Name the structural feature of the palisade cell that enables it to perform the function stated in (b) (iii) above.

..... [1]

[Total 13]

- 3** A solution of 4 cm³ containing equal amounts of starch and saliva was prepared in test tubes **A**, **B** and **C**. The test tubes were immediately placed in different temperature environments as follows;

Test tube **A**: Ice bath

Test tube **B**: A water bath at 37°C.

Test tube **C**: A water bath containing boiling water

After a period of five minutes, 3 drops of iodine solution were added to each test tube.

- (a) (i)** State the observations that were made in the different test tubes and make conclusions on each test tube.

Test tube **A**

Observation:
 [1]

Conclusion: [1]

Test tube **B**

Observation: [1]

Conclusion: [1]

Test tube **C**

Observation: [1]

Conclusion: [1]

- (ii)** Give reasons for the observations made in the different test tubes.

Test tube **A**: [1]

Test tube **B**: [1]

Test tube **C**: [1]

- (iii)** Name any **two** substances that are in saliva and state their functions.

1. Name of substance [1]

Function of substance [1]

2. Name of substance [1]

Function of substance [1]

[Total 13]