**Term 1 – 2023 OPENER EXAM**

**BIOLOGY (231/3)**

**FORM (4)**

**Time:** $1\frac{3}{4}Hours$

**Name**: …………………………………………………………. **Adm** **No**: ……………….

**School**: ……………………………………………………….. **Class**: …………………..

**Signature**: …………………………………………………….. **Date**: …………………...

**INSTRUCTIONS TO CANDIDATES:**

1. Write your **name,** **admission number** and **school** in the spaces provided above.
2. **Sign** and write the **date** of examination in the spaces provided above.
3. Answer all the questions in the spaces provided.
4. You are required to spend the first **15** minutes of the **1¾** hours allowed for
5. this paper reading the whole paper carefully before commencing your work.
6. This paper has **three** questions.
7. Students should check the question paper to ascertain that all the papers are printed as indicated and that no questions are missing.
8. Candidates should answer the questions in English.

**FOR EXAMINER’S USE ONLY:**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum****Score** | **Candidate’s****Score** |
| **1** | **14** |  |
| **2** | **14** |  |
| **3** | **12** |  |
| **Total Score** | **40** |  |

**1**. You are provided with specimen T.

a) Cut a 1 cm slice from the specimen and remove its peel. Place the soft inner part into a boiling tube labelled A.

Cut another 1 cm slice from the specimen and remove its peel. Using a pestle mash the soft inner part into a paste. Place the paste into a boiling tube labelled B.

Add 4 cm3 of dilute hydrogen peroxide solution into each of the boiling tubes A and B.

i) Record your observations (2mks)

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ii) Account for the results in 1. a) i) above (2mks)

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iii) Write an equation for the breakdown of hydrogen peroxide (1mk)

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b) Cut a 2 cm slice from specimen T and remove its peel. Place the soft inner part in a mortar, and using a pestle mash it into a fine paste. Add a little of distilled water and stir the mixture. Pour the mixture into a beaker and allow it to stand for 2 minutes. Using the reagents provided, test for the food substances in the mixture. Record procedure, observation and conclusion in the table below (9mks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Food substance being tested** | **Procedure** | **Observation** | **Conclusion**  |
| **Starch**  |  |  |  |
| **Vitamin C** |   |  |  |
| **Reducing Sugar** |  |  |  |

2. The following photomicrographs K and L illustrate cross sections of an organ as found in different plants. Use the photomicrographs to answer the questions below.

 K L



1. Name the organ from which the above cross- sections have been obtained giving a reason for your answer. (2mks)

Organ ……………………………………………………………………………………

Reason …………………………………………………………………………………..

1. Label the following parts on the photomicrograph K; (3mks)

 Xylem

 Phloem

 Endodermis

1. State the differences between cross section K and cross section L. (2mks)

|  |  |
| --- | --- |
|  cross section K |  cross section L |
|  |  |
|  |  |

1. Identify any two differences between xylem and phloem. (2mks)

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1. State two adaptations of xylem to their function. (2mks)

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1. Name a tissue present in photomicrograph K that is absent in photomicrograph L. (1mk)

……………………………………………………………………………………………..

1. Give the function of each of the following tissues; (2mks)

Cortex ……………………………………………………………………………………..

Endodermis ……………………………………………………………………………….

3. Below are photographs labelled **L1, L2, L3, L4** and **L5** of twigs obtained from plants. Examine them.

  **L1**   **L2**

 

L3 L4

 

 L5

 

a) Using observable features in the photographs, complete the dichotomous key given below (2mks)

**i. a) Leaves compound ………………………………………………… go to 2**

 **b) \_\_\_\_\_\_\_\_\_\_\_ …………………………………………………. go to 3**

**ii. a) Leaf bipinnate …………………………………………………… Mimosaceae**

 **b) Leaf trifoliate .…………………………………………………… Oxalidaceae**

**iii. a) Leaf with network venation ………………………………………………… go to 4**

 **b) \_\_\_\_\_\_\_\_\_\_\_ …………………………………………………….. go to 5**

**iv. a) Leaf with entire margin …………………………………………………..Nyctaginaceae**

 **b) Leaf with serrated margin .…………………………………………………Verbenaceae**

**v. a) Leaf with solid petiole ………………………………………………… Agavaceae**

 **b) Leaf with sheath like petiole ………………………………………………Graminae**

b) Use the completed dichotomous key to identify the family to which each plant belongs. In each case show the steps you followed to arrive at the identity (10mks)

|  |  |  |
| --- | --- | --- |
| **Specimen** | **Steps** | **Identity** |
| **L1** |  |  |
| **L2** |  |  |
| **L3** |  |  |
| **L4** |  |  |
| **L5** |  |  |