**NAME: ………………………………………………..………………… INDEX NO: ………………………**

**SCHOOL: ……………………………..……………………………….. DATE: …………………………..**

**CANDIDATE’S SIGNATURE: ………………….…..……………**

**231/3**

**BIOLOGY**

**(PRACTICAL)**

**PAPER 3**

**TIME: 1 ¾ HOURS**

***Kenya Certificate of Secondary Education(K.C.S.E)***

**BIOLOGY**

Paper 3

**INSTRUCTIONS TO CANDIDATES:**

* *Write your* ***name*** *school and* ***index number*** *in the spaces provided at the top of this page.*
* *Sign and write* ***date*** *of examination in the spaces provided above*
* *Answer* ***all*** *the questions*
* *You are required to spend the first 15 minutes of the 1 ¾ hours allowed for this paper reading the whole paper carefully before commencing your work.*
* *Answers must be written in the spaces provided in the question paper.*
* *Additional page must not be inserted.*
* *Candidate will be penalized for recording irrelevant information and wrong spelling especially of technical terms*

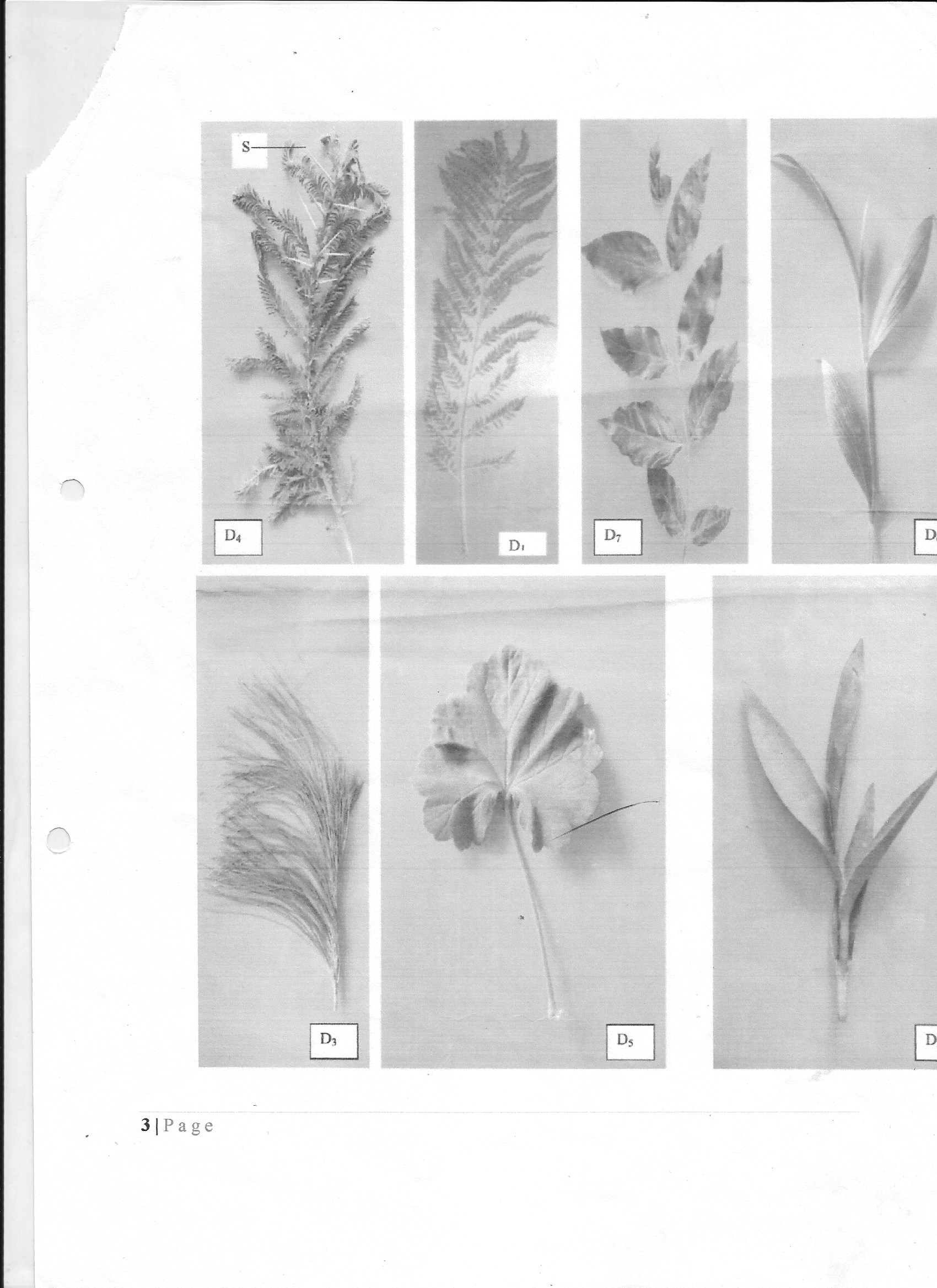
***For Examiner’s Use Only:***

|  |  |  |
| --- | --- | --- |
| **QUESTIONS** | **MAXIMUM SCORE** | **CANDIDATES SCORE** |
| 1 | 10 |  |
| 2 | 15 |  |
| 3 | 15 |  |
| **TOTAL** | **40** |  |

*This paper consists of 6 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

1. You are provided with seven specimens of plants. They are labelled **D1, D2, D3, D4, D5, D6**, and **D7**

The dichotomous key.



D3

D6

D7

D1

D4

D2

D5

1a) Leaves needle-like…………………………………………………………Go to 2

b) Leaves broad………………………………………………………………Go to 3

2a) Leaves arranged in clusters on stem…………………………………………*Pinaceae*.

b) Leaves not arranged in clusters on stem…………………………………….*Araucariaceae*

3a) Leaves compound…………………………………………………………..Go to 4

b) Leaves simple………………………………………………………………Go to 7

4a) Leaves pinnate……………………………………………………………Go to 5

b) Leaves bipinnate………………………………………………………….Go to 6

5a) Leaflet attached to many small stalks that join to the main one……………*Mimosaceae*

b) Leaflets attached to one stalk……………………………………………….*Rosaceae*

6a) Leaflets attached to many small stalks that join the main one………………*Bignonaceae*.

b) Leaflets attached to one stalk………………………………………………..*Compositae*.

7a) Leaves green…………………………………………………………………Go to 8

b) Leaves purple………………………………………………………………..Go to 9

8a) Leaves parallel veined………………………………………………………*Graminaceae*

b) Leaves net veined……………………………………………………………..*Geranaceae*

9a) Leaves parallel veined……………………………………………………….*Commelinacea*

b) Leaves not veined…………………………………………………………….*Euphorbiaceae*

Use the ditochomous key to identify the taxonomics groups of each of the specimens in the photographs

provided. (5mks)

**Specimen Steps followed Identity**

**D1** ……………………………………… ………………………………

**D3** ……………………………………… ……………………………….

**D5** ……………………………………… ……………………………….

**D6** ……………………………………… ……………………………….

**D7**  ……………………………………… ……………………………….

(b)(i) Suggest the possible habitat that specimen **D4** is adapted to (1mk)

…………………………………………………………………………………………………………

(ii) Name **one** observable feature that adapts **D4** to the habitat you have mentioned in **(b) (i)**

above (1mk)

…………………………………………………………………………………………………………

(iii) State the importance of the structure labelled **S** oin specimen **D4**. (1mk)

…………………………………………………………………………………………………………

(c) (i) The stem of specimen **D2** was squeezed strongly. State the expected observations. (1mk)

…………………………………………………………………………………………………………

(ii) Suggest how specimen **D2** is adapted to its habitat. (1mk)

…………………………………………………………………………………………………………

1. The photographs lebelled **R, S, T** and **V** are bones obtained from a mammal.

Examine them.

1. Identify the bones and name the part of the mammalian body from which each bone was obtained.

(4mks)

|  |  |  |
| --- | --- | --- |
| **Bone** | **Identify** | **Where found** |
| **R** |  |  |
| **S** |  |  |
| **T** |  |  |
| **V** |  |  |

(b) (i) Name the joint formed between bones **S** and **T** at point marked **X**. (1mk)

…………………………………………………………………………………………………………

(ii) Give the characteristics of the joint named in (b) (i) above. (1mk)

…………………………………………………………………………………………………………

(c) (i) Name the bone structure labeled **Y**. (1mk)

…………………………………………………………………………………………………………

(ii) State **one** function of the bone structure named in **C** (i) above. (1mk)

…………………………………………………………………………………………………………

(d) (i) Using observable features give **two** adaptations of the bone labeled **R**. (2mks)

…………………………………………………………………………………………………………

…………………………………………………………………………………………………………

(ii) On bone **V**, draw a diagram of bone **R** to show the articulation between the two bones. (2mks)

…………………………………………………………………………………………………………

…………………………………………………………………………………………………………

(e) Name the part labelled **Z** in the bone **S** and state its function. (2mks)

Part **Z** …………………………………………………………………………………………………

Function …………………………………………………………………………………………………

…………………………………………………………………………………………………

1. Name the joint formed by bone **T** with adjacent bone at its distal end. (1mk)

…………………………………………………………………………………………………………

**3. You are provided with the following:**

* Solution labelled **A**
* Benedict’s solution labelled solution **B**
* Solution **C**
* 0.1% NaCl solution
* 1.4% / NaCl solution
* Iodine solution labelled solution **E**

Label three test tubes, **P, Q** and **R**. Into each test-tube, place 3ml of the solution **C**

1. Put a drop of solution **P** on a white tile and add a drop of iodine (solution **E**)

Repeat the procedure for each test tube **Q** and **R**.

Record your observations in the table below. (3mks)

|  |  |
| --- | --- |
| **Test-tube** | **Observation** |
| **P** |  |
| **Q** |  |
| **R** |  |

1. To test tube **Q** add 3 drops of 0.1% sodium chloride solution and 2ml of solution **A**. To test

tube **R**, add three drops of 1.4% sodium chloride solution and 2ml of solution **A**. Place the test tube **P**. **Q** and **R** in a water bath and maintained at 370C for 30 minutes. Using a drop of the solution from each test tube, repeat the procedure in (a) above and spare the rest for next question. Record your observations in the table below. (3mks)

|  |  |
| --- | --- |
| **Test-tube** | **Observation at the end of experiment** |
| **P** |  |
| **Q** |  |
| **R** |  |

(c) Put 2cm3 of solution from test tube **P** in a clean test tube and add 2cm3 of Benedict (solution **B**)

shake then heat the mixture to boil in a hot water bath.

Record your final observations in the table below.

Repeat the procedure for solution **Q** and **R**. (3mks)

|  |  |
| --- | --- |
| **Test-tube** | **Observation after experiment** |
| **P** |  |
| **Q** |  |
| **R** |  |

(d) Why was the test tube **P** included in the experiment? (1mk)

…………………………………………………………………………………………………………

1. Account for observations made in test tube **Q** and **R** at the end of the experiment.

(i) Test tube **Q**  (2mks)

…………………………………………………………………………………………………………

…………………………………………………………………………………………………………

1. Test tube **R**

…………………………………………………………………………………………………………

…………………………………………………………………………………………………………

1. Suggest the identity of solution **A**. (1mk)

…………………………………………………………………………………………………………

(h) Why was the water bath maintained at 370C? (1mk)

…………………………………………………………………………………………………………