Students Name: …………………………………………………………………

School Name:…………………………………… Index Number ……………

553/3

BIOLOGY

PAPER 3

Nov/Dec 2020

2 Hours



**HES MOCK EXAMINATIONS 2020**

**UGANDA CERTIFICATE OF EDUCATION**

BIOLOGY

**PAPER 3**

**2 HOURS**

**INSTRUCTIONS:**

 *Answer* **all** *questions.*

 *Drawings and answers should be made and written in the spaces provided respectively.*

 *Use a sharp HB pencil for your drawings.*

 *Coloured pencils or crayons should* **not** *be used.*

 No *additional sheets of writing paper are to be inserted in this booklet.*

 *Work on additional sheets will* **not** *be marked*

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| **For Examiners’ use only** |
| **Question** | **Marks** | **Examiner’s Signature** |
| **1.** |  |  |
| **2.** |  |  |
| **3.** |  |  |
| **Total** |  |  |

1. You are provided with specimen ***O,*** which is an organ from a plant. Peel the organ removing only a thin layer. Chop the tissue into small cubes (about 15) of equal size; $(5 mm ×5 mm×5 mm)$.

 (a) Use the cubes of the tissue as instructed in the tables below; (08 marks)

***Table I***

|  |  |  |
| --- | --- | --- |
| **Test** | **Observation** | **Deduction** |
| 1. To $3cm^{3}$of hydrogen peroxide in a test tube add 2 cubes.
 |  |  |
| 1. To $3cm^{3}$ of hydrogen peroxide in a test tube add $2cm^{3}$ of solution $N$, test the mixture with litmus paper. Add 2 cubes to the mixture.
 |  |  |
| 1. To $3cm^{3}$ of hydrogen peroxide in a test tube add $2cm^{3}$ of solution $M$, test the mixture with litmus paper. Add 2 cubes to the mixture.
 |  |  |
| 1. To $3cm^{3}$of hydrogen peroxide in a test tube add $2cm^{3}$ of distilled water. Test the mixture with litmus paper. Add 2 cube to the mixture.
 |  |  |

 (b) (i) Explain your results in test (i) in table I above. (02 marks)

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 (ii) Identify the active ingredient in the tissue. (01 mark)

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1. Make a general conclusion about the activity of the active ingredient mentioned in (b) (ii) above, basing on the results in test (ii), (iii) and (iv) in table I. (02 marks)

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(d) Work out; (07 marks)

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| --- | --- | --- |
| **Test** | **Observation** | **Deduction** |
| 1. To $3cm^{3}$of hydrogen peroxide in a test tube add 1 (one) cube.
 |  |  |
| 1. To $3cm^{3}$ of hydrogen peroxide in a test tube add 1 (one) crushed cube.
 |  |  |
| 1. To $3cm^{3}$ of hydrogen peroxide in a test tube add 3 crushed cubes of the tissues.
 |  |  |
| 1. To $3cm$ of distilled water in a test tube add 1 (one) cube.
 |  |  |

(e) (i) State **two** factors that affect the activity of the active ingredient in the

tissue, that are investigated in tests (i) and (ii) and (iii) table II.

 (02 marks)

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 (ii) State the property of the active ingredient investigated in test (iv) in table II. (01 mark)

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2. Specimens ***P***, $Q$, $R$, $S$, $T$ and $U$ are leaves of plants.

 (a) (i) State the group of plants to which the parent of specimen $P$ belongs. (01 mark)

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 (ii) Give **two** reasons for your answer in (a) (i) above. (02 marks)

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 (b) How is the structure of specimen ***P*** related to its function? (03 marks)

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(c) (i) Make a drawing of specimen $S$, on it label on the major parts of a leaf. (04 marks)

 (ii) Identify the parallel veins in specimen $S$. (01 mark)

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 (d) (i) Fill the table below. (04 marks)

**Table III**

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| **Specimen** | **Description of petiole** |
| $$Q$$ | ………………………………………………………………………...………………………………………………………………………...………………………………………………………………………...………………………………………………………………………... |
| $$R$$ | ………………………………………………………………………...………………………………………………………………………...………………………………………………………………………...………………………………………………………………………... |
| $$S$$ | ………………………………………………………………………...………………………………………………………………………...………………………………………………………………………...………………………………………………………………………... |
| $$T$$ | ………………………………………………………………………...………………………………………………………………………...………………………………………………………………………...………………………………………………………………………... |
| $$U$$ | ………………………………………………………………………...………………………………………………………………………...………………………………………………………………………...………………………………………………………………………... |

 (ii) Usingfeatures of the petioles only make a dichotomous to identify the

specimens considered in table III. (04 marks)

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3. You are provided with specimens ***W***, $X$ and ***Y***, which are all freshly killed animals.

(a) (i) Identify the phylum to which the animals belong. (01 mark)

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(ii) State **three** reasons for your answer in (a) (i) above. (03 marks)

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 (b) Make a labeled drawing of the dorsal view of the head of specimen $X$. (05 marks)

(c) State the habitat of each animal and the role the animal plays in the habitat.

 (03 marks)

(i) ***W***; habitat ……………………………………………………………………

 Role:

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(ii) ***X***; habitat ……………………………………………………………………

 Role:

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(iii) ***Y***; habitat ……………………………………………………………………

 Role:

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(d) Show how the structure of specimen ***W*** has enabled it to survive in its habitat. (06 marks)

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**END**