Name……Signature…….

School…….

553/2

BIOLOGY

(Practical)

PAPER 2

March/April 2023

**EASTERN WING EXAMINATION OBSERVORS**

Uganda Certificate of Education

BIOLOGY

(PRACTICAL)

Paper 2

2 Hours

Instructions to Candidates:

- Attempt all the questions in this paper.
- Write your answers in the spaces provided.
- Drawings should be made in the spaces provided.
- Use sharp pencils only for your drawings.
- Work on additional sheet of paper will not be marked.

**FOR EXAMINERS' USE ONLY**

| Questions | Marks | Initials |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| Total | | |

(a) You are provided with solutions L and M. Solution L is a food containing solution. Solution M contains an active substance.

Carry out the following tests on solution L to identify the food substances present. Record your observations and deductions in the table below.

| TEST | OBSERVATION | DEDUCTION |
|---|---|---|
| (i) To 1 $cm^3$of solution L in a test tube, add 3 drops of iodine solution. | | |
| (ii) To 1 $cm^3$of solution L in a test tube, add 1 $cm^3$ f sodium hydroxide solution and then 3 drops of copper(II) sulphate solution. | | |

(b) State the food substances present in solution L.

……

……

……

(c) Label two test tube as 1and 2. Add the contents to the test tubes as shown in the table below.

| TEST TUBE | CONTENTS |
|---|---|
| 1 | 1 $cm^3$ of L + 1$cm^3$ of M |
| 2 | 1 $cm^3$ of L + 1 $cm^3$ of boiled and cooled M |

Insert the test tubes in a water bath maintained between 35$^o$ C to 40$^o$C for 20 minutes (You may proceed with another work in the meantime).

After 20 minutes of incubation, carryout the following tests. Record your observations and deductions in table 3 below.

| TEST | OBSERVATION | DEDUCTION |
|---|---|---|
| (i) To 1 $cm^3$of contents from test tube 1, in a test tube, add 3 drops of iodine solution. | | |
| (ii) Repeat test (i) above using contents in test tube 2 | | |
| (iii) To 1 $cm^3$ of contents from test tube 1, add 1 $cm^3$ of sodium hydroxide solution followed by 3 drops of copper(II) sulphate solution. | | |
| (iv) Repeat the procedure in (iii) using contents in test tube 2. | | |

(d) Explain your results in each test tube.

(i) Test tube 1.

……

……

……

……

(ii) Test tube 2.

……

……

……

……

(e) Giving one reason in each case, state the;

(i) nature of solution M.

……

……

…….....

(ii) identity of solution M.

……

……

……

(f) State two aims of this experiment.

……

……

……

……

(g) Suggest one factor investigated in this experiment.

……

……

……

……

(h) State two properties of solution M as shown in this experiment.

……

……

……

……..

2. You are provided with specimens P, Q, R and S which are plant parts.

(a) (i) State the identify the specimens P, Q, R and S.

……

……

(ii) Give two structural features to support your answer in (a) (i).

……

……

……

……

(b) State one main function performed by the specimens on the plants they were obtained.

……

……

(c) Describe three adaptations of these specimens to the function stated in (b) above.

……

……

……

……

……

……

……

……

(d) Describe the petiole of each specimen.

Specimen P.

……

……

……

……

Specimen Q.

……

……

……

……

Specimen R.

……

……

……

……

Specimen S.

……

……

……

……

(e) Using the descriptions in (d) only, construct a dichotomous key to identify specimens P, Q, R and S.

……

……

……

……

……

……

……

……

……

……

……

……

(f) Draw and label specimen Q. State your magnification.

3 You are provided with specimen Z. Observe the specimen using a hand lens and answer the questions that follow.

(a) (i) State the phylum to which the specimen belongs. Give three observable structural features to support your answer.

Phylum.

……

Observable structural features.

……

……

……

(ii) Identify the class to which the specimen belongs. Give three observable structural features to support your answer.

Class.

……

Observable structural features.

……

……

……

(b) (i) State the habitat of specimen Z. Give one observable structural feature to support your answer.

Habitat.

……

……

Observable structural feature.

……

……

(ii) Identify the sex of specimen Z. Give two observable structural features to support your answer.

Sex of specimen Z.

……...

Observable structural features.

……

……

(c) Using a razor blade, cut to remove the left outer wing and the left inner wings of specimen Z. Observe the wings using a hand lens.

(i) Suggest the function of the outer wing and the inner wing on the specimen. State three observable features to support your answer.

Function of the outer wing.

……

……

Observable structural features.

……

……

……

……

……

……...

Function of the inner wing.

……

……

Observable structural features.

……

……

……

……

(ii) State three differences between the outer wing and the inner wing.

| Outer wing. | Inner wing. |
|---|---|
| | |
| | |
| | |

(d) Using features on the head only, describe three adaptations of the specimen to survive in its habitat.

…….

……..

……..

……..

……

(e) Observe the thorax of specimen Z ventrally. Draw and label. State your magnification.

**END**

**Confidential**

**L**- 10 $cm^3$ of egg albumen and 2g of starch in 100 $cm^3$ of distilled water.

**M**- 3g of amylase enzyme dissolved in 100 $cm^3$ of distilled water.

**P**- Mature lantana camara leaf.

**Q**- Mature *Commelina benghalensis* leaf.

**R**- Mature coach grass leaf.

**S**- Mature Hibiscus leaf.

**Z**- Mature freshly killed cockroach.