

Names:.....Index. No:.....

School Exam Number.....Signature:.....

Candidates should **NOT** write their Centre Name
or Centre Number anywhere on this booklet

P530/3
BIOLOGY
(PRACTICAL)
Paper 3
2 August 2024
3 ¼ hours



ENTEBBE JOINT EXAMINATION BUREAU

Uganda Advanced Certificate of Education

BIOLOGY

Paper 3

3 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **three** questions.*

*Answer **all** questions*

Write the answers in the spaces provided. No additional sheets of paper should be added.

*You are **not** allowed to start working within the first 15 minutes. You are advised to use this time to read through the paper and ensure that you have all the apparatus, chemicals and specimens you require.*

FOR EXAMINERS' USE ONLY		
QUESTION	MARKS	EXAMINER'S NO & INITIALS
1		
2		
3		
TOTAL		

1. You are provided with specimen **K** which is freshly killed.
- (a) Observe its head. Basing on the structures of the head, state the class and order of the specimen giving a reason in each case. (04 marks)

i) Class

Reason

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ii) Order

Reason

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- (b) (i) Using a ruler, measure the length of the tail and length of the whole body minus tail. Record your results in the table below. (02 marks)

Length of the whole body minus tail (<i>mm</i>)	
Length of the tail (<i>mm</i>)	

- (ii) Using your results in (b) (i) above, obtain the ratio of length of whole body minus tail to the whole body minus tail. (01 mark)

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- (iii) What is the significance of the ratio obtained in (b) (ii) to the survival of the specimen in its habitat? (02 marks)

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- (c) Examine the external features on the ventral side. Draw and label features on the posterior abdominal region that are typically of the class to which the specimen belongs including the upper part of the tail which should not be labelled.

(07 marks)

- (d) Pin the specimen with ventral side upper most.
- (i) Dissect it to display blood vessels that return blood from the right side of the head back to the heart.
 - (ii) Carefully cut out the alimentary canal and clear any fat tissue to display blood vessels supplying blood to the excretory system, reproductive system and left limb. Without displacing the heart, draw and label.

(24 marks)

2. You are provided with solutions **A, B, C, D, E, F** and specimen **S**. You are required to carry out tests on the solutions using specimen **S**, following the procedure provided.

Procedure

- a) (i) Label 6 test tubes as **A, B, C, D, E** and **F** and add 10 cm^3 of the corresponding solutions to each test tube.
- ii) Using a cork borer cut out 10 pieces from specimen **S**, measuring 4 cm long.
- iii) Put two pieces of **S**, made in (a)(ii) into each test tube and leave the setup for one hour.
- iv) After one hour, carefully pour out all the liquid from test tube **A** into a measuring cylinder leaving behind the pieces of **S** in the test tube.
- v) Record the final volume of the liquid from test tube **A** in the table below.
- vi) Repeat steps (iv) and (v) for the remaining test tubes to obtain the final volume of the liquids from test tubes **B, C, D, E** and **F**. Record each of them in the table. (06 marks)

Test tube	Final volume (cm^3)	Change in volume (cm^3) (final volume – initial volume)
A		
B		
C		
D		
E		
F		

- b) Work out the change in volume in each test tube and complete the table above. (06 marks)

- c) In the space provided, draw a histogram of change in volume against solutions A, B, C, D, E and F. (07 marks)

- d) Using your histogram, explain the changes in volume of each solution. (10 marks)

A

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B

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C

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D

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E

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F

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- e) From your results, which solution had the water potential closer to that of the cell sap of specimen **S**? Give a reason for your answer. *(02 marks)*

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3. You are provided with reproductive organs obtained from different plants labelled **M**, **N**, **O** and **P**.

- (a) Describe the flower arrangement of the inflorescence of:

- (i) Specimen **M**. *(03 marks)*

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(ii) Specimen **O**.

(02 marks)

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- (b) (i) With a named agent of pollination, how is specimen **O** adapted to reproduction from the plant it was obtained from? (06 marks)

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- (ii) Write the floral formula of specimen **O**.

(01 mark)

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- (iii) Remove all the structures to obtain the ovary of specimen **O**. Cut to obtain a thin transverse section and place it on a glass slide. Mount and observe under low power of a microscope. Draw and label the observed structures.

(08 marks)

- (c) Obtain a flower from each of the inflorescences of **O** and **P**. Carefully expose and observe their parts, using a hand lens if necessary. State **four** observable structural differences between them. (04 marks)

<i>O</i>	<i>P</i>

- d) By examining structural and internal structures of the flowers, construct a dichotomous key for their identification. (05 marks)