Name's of student.....

School Name.....

BIOLOGY PAPER II
P530/2
SENIOR SIX
JUNE-JULY.

COMPREHENSIVE BIOLOGY TRANSFORMATION INITIATIVE.
UGANDA ADVANCED CERTIFICATE OF EDUCATION.
(UACE)

S.6 CANDIDATES- 2024

PAPER 2

RESOURCEFUL EXAMINATION

2 HOURS AND 30 MINUTES

INSTRUCTIONS TO THE CANDIDATES:

This paper consists of section A and B.

Answer question one in section A plus 3 questions in section B

Candidates are advised to read questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagram wherever necessary.

N.B <u>QUESTION ONE IS COMPULSORY TO ALL CANDIDATES</u>.

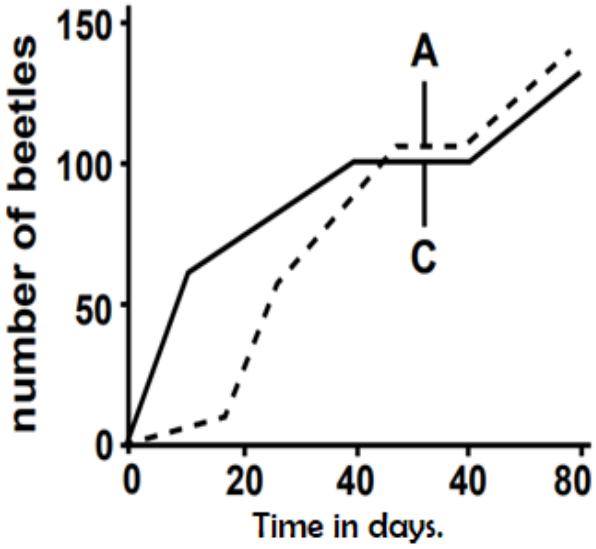
1. In an experiment to study the **interaction of two species of Beetles A and C. Species A was reared with much smaller beetles, Species C,** in **containers of flour in which a number of short lengths of glass tubing had been buried**.

Graph 1: Shows the results using **glass tubing narrower in diameter than the body size of species A** but **wider than that of species C**.

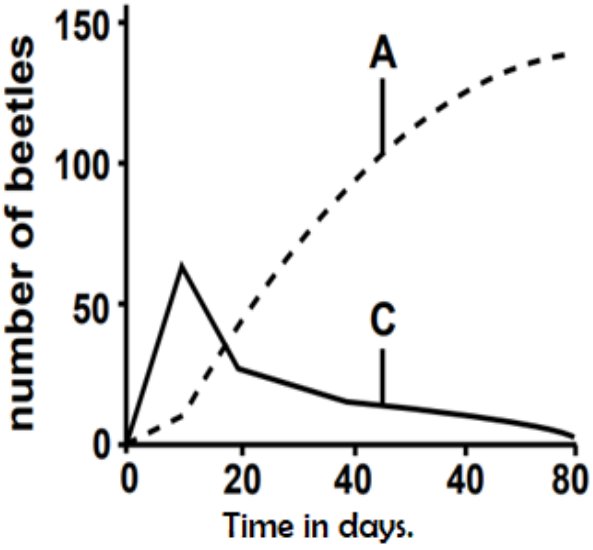
Graph 2: Shows the results **using glass tubing wider than the body sizes of both species A and C.**

Study the graphs and **provide suitable responses**.

Graph 1: (Narrow glass tubes)



Graph 2: (Wide glass tubes)



(a) **Compare** the **number of beetles** during **the time of the** experiment for **species A and C** in:

(i) Graph 1. **(07 marks)**

(ii) Graph 2. **(07 marks)**

(b) **Explain** the **differences in the number of the Beetle species** in:

(i) Graph 1. **(07 marks)**

(ii) Graph 2. **(07 marks)**

(c) Suggest what is shown by the **interaction of Species A and C in wide glass tubing.** **(03 marks)**

(d) From interaction of species in **Graph 1** and **Graph 2,** explain the **effect of interspecific competition.** **(05 marks)**

(e) **Suggest** what **would happen** if the

(i) **Experiment in Graph 2 continued for some time**.

(02 marks)

(ii) **Species C grown alone.**

(02 marks)

SECTION B (60 MARKS)

Answer two Questions from this Section.

2**(a)** Explain the:

(i) **Term Heterozygote Superiority**. **(05 marks)**

(ii) **Relationship between Speciation and Gene Migration**.

(07 marks)

(b) **In Guavas**, flower colour is determined **by a gene that has two alleles**, one producing **yellow flowers** and the other **white flowers**. Another gene determines the **colour of fruit**. Gene has two alleles, one producing **red fruit** and other producing **yellow fruits**. A Guava plant with **yellow flowers** and **red fruit** is **crossed** with a **Guava plant with white flowers** and **yellow fruits**. All F1 offspring had **yellow flowers** and **red fruit**s. A plant from F1 was **self-pollinated**.

(i) If the two genes **are linked or unlinked**. Predict the ratios **for F2 generations**. **(02 marks)**

(ii) When **a plant** in **F1 generation** was **self-pollinated**, the **actual results** were.

Yellow flowers and red fruit	**68**
Yellow flowers and yellow fruit	**07**
White flowers and red fruit	**07**
White flowers and yellow fruit	**18**

Using your **knowledge of genetics**, suggest what might have happened that would explain the **appearance** of the **unexpected varieties**.

(06 marks)

3(a) Explain the advantages of **carrying haemoglobin inside red blood** cells than in **the plasma solution**. **(08 marks)**

(b) (i) Describe the process of **unloading haemoglobin with Oxygen** at the **Mitochondrion of a metabolically active tissue.** **(12 marks)**

4(a)(i) Describe how the **electrons from water** are used to form Reduced **Nicotinamide Adenine Dinucleotide Phosphate (NADPH2).** **(10 marks)**

(ii) Explain why **Bundle sheath cells** have **Poorly** developed **grana.** **(05 marks)**

(b) Explain the role of **chemo-autotrophic bacteria in the Nitrogen cycle.** **(05 marks)**

5(a) Explain the **interaction** between the **products of digestion** and the **activities** of the **liver and pancreas.** **(10 marks)**

(b) Relate the methods of **nitrogenous waste excretion to the energy requirements and** control of the **water potential** in variety of animals. **(10 marks)**

6(a) Outline the **Major skeletal tissues** and **relate** their **distributions to Function** in organisms**.** **(12 marks)**

(b) Explain the role of the **properties** of the **skeletal Muscles in Man.** **(08 marks)**