

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 QUESTION ONE IS COMPULSORY TO ALL CANDIDATES.

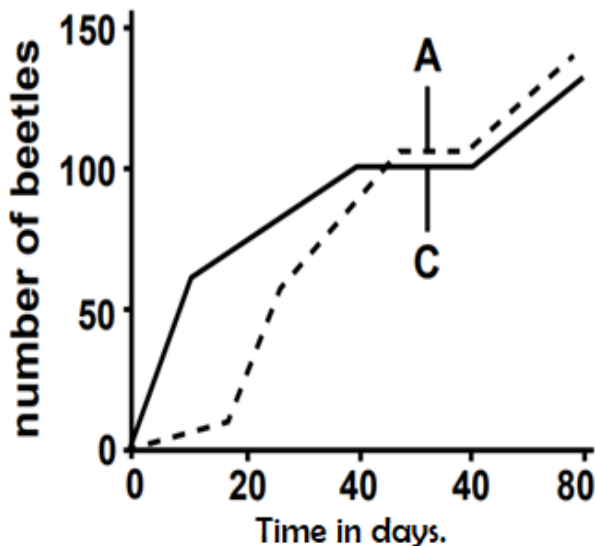
1. In an experiment to study the interaction of two species of Beetles A and C. Species A was reared with much smaller beetles, Species C, in containers of flour in which a number of short lengths of glass tubing had been buried.

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.

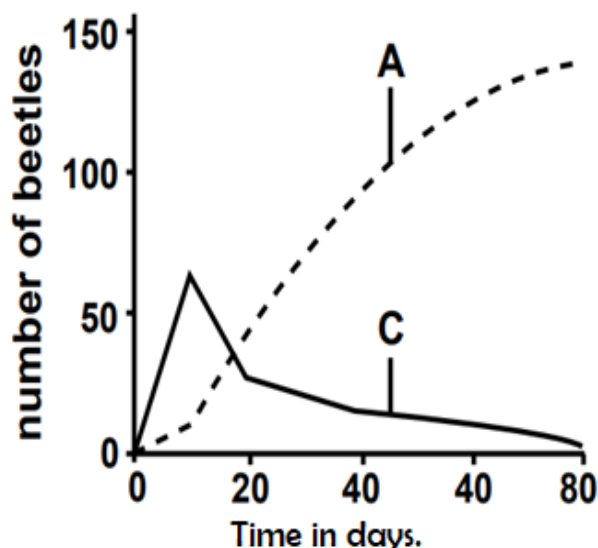
Graph 2: Shows the results using glass tubing wider than the body sizes of both species A and C.

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 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 fruits**. 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)

*CC- Comprehensive Biology Transformation Initiative.
Transforming Biology Pedagogy.
Contributions made by MUGWE MARTIN.*