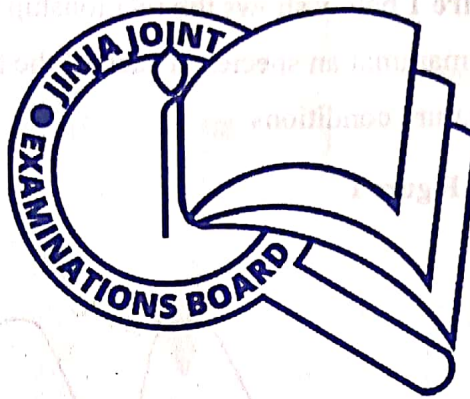


P530/2
BIOLOGY
(Theory)
Paper 2
AUGUST, 2023
2½ hours



JINJA JOINT EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

MOCK EXAMINATIONS – AUGUST, 2023

BIOLOGY

(THEORY)

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

*Answer question **ONE** in section **A** plus three others from section **B**.*

Candidates are advised to read questions carefully, organize their answers and present them precisely and logically.

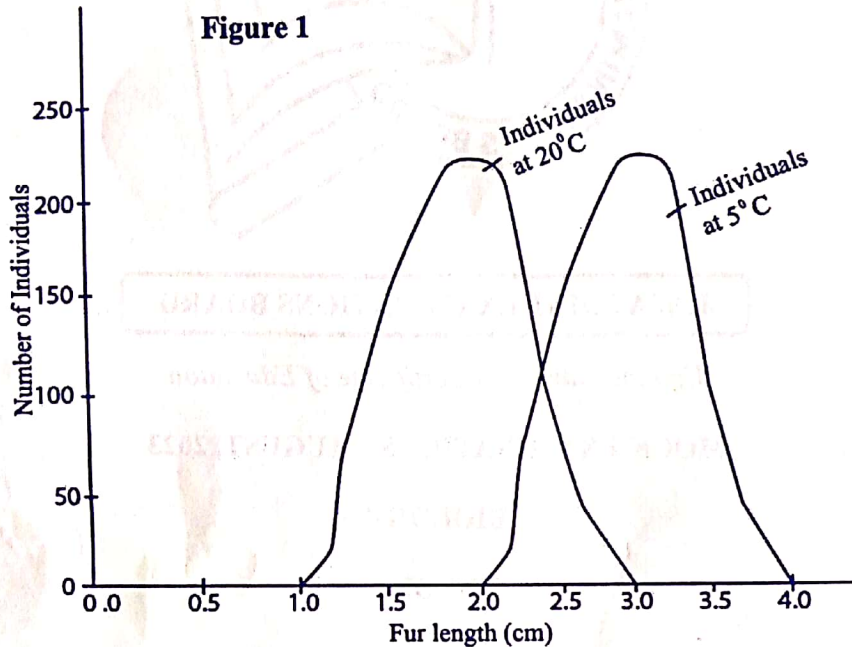
Illustrate, whenever necessary, with well labelled diagrams.

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Turn Over

SECTION A (40MARKS)

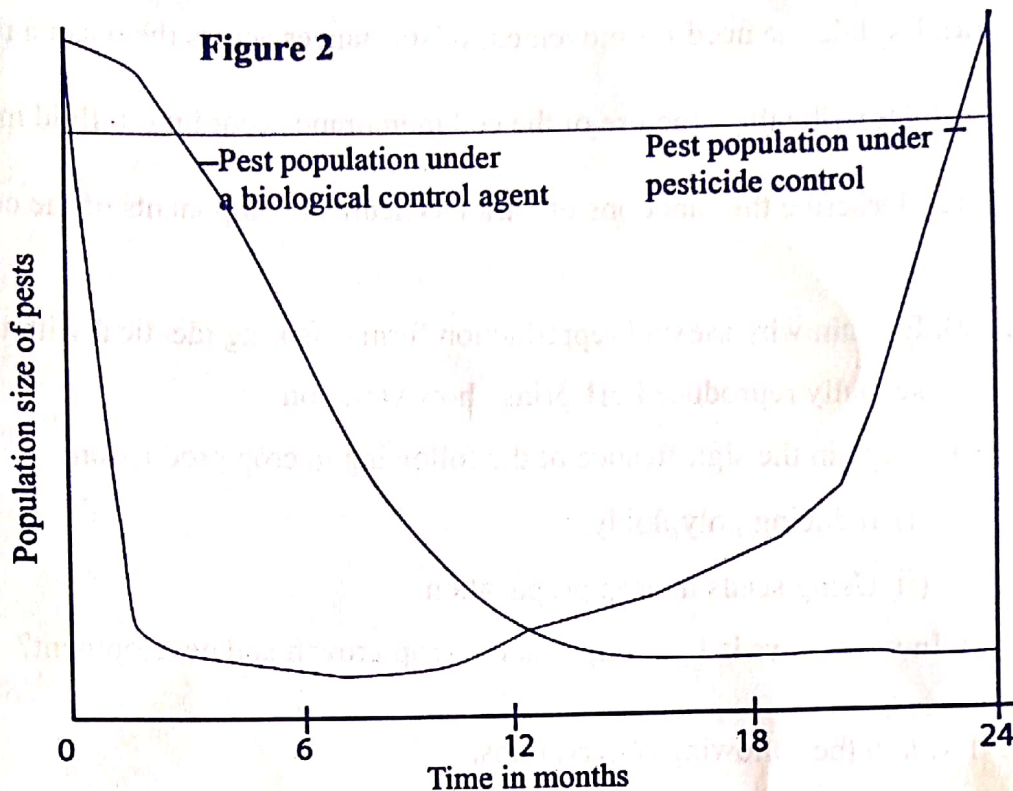
1. The graph in **figure 1** below shows the relationship between fur length and the number of individuals of a mammalian species in each of the two different terrestrial habitats of different temperature conditions.



- (a). Describe the relationship between the fur length of the individuals and their number in each of the habitats. (03 marks)
- (b) Explain how
- (i) the fur lengths affect the distribution of the individuals of a mammalian Species in the two habitats of different temperatures (08 marks)
 - (ii) the relationship between fur length and the number of individuals of a mammal in the habitats affects the evolutionary change of the organisms. (04marks)
- (c). Explain the importance of maintaining constant body temperature in mammals (05marks)

The graph in **figure 2** below shows the variation in the population of the pest species of the fruit crops at two separate gardens both cultivated for same type of crop over a period of two years.

The necessity of two separate gardens was because some clients of the farmer wanted fruits and vegetables for their customers where no chemicals in form of pesticides and herbicides were not used in their production.



- (d). Describe the effects of using each type of control agent over the two-year period. (07marks)
- (e) (i). Suggest why some clients of the farmer were against fruits and vegetables for their customers from the gardens where pesticides, herbicides and other chemicals were applied in their production. (03marks)
- (ii) State the possible challenges which the farmer could have experienced in using the biological control agents to eliminate the arthropod pests. (03marks)
- (f) (i). What are the likely long term effects of using chemicals to control pests and diseases in crop plants. (03marks)
- (ii). Explain in evolutionary terms how change in the population of pests under control of pesticides could be of benefit in agricultural productivity. (04marks)

SECTION B (60 MARKS)

2. (a). Explain the importance of maintaining the pH of mammalian blood and tissue fluid within a narrow limit. (04marks)
- (b). How does the pH of blood regulate in mammals? (07marks)
- (c). State the form human bodies obtain protein and give the functions of the absorbed protein substances. (09marks)

3. (a). Explain the need for movement of substances across the plasma membranes. (04marks)
- (b). Describe the structure of the cell membrane according to fluid mosaic model. (08marks)
- (c). Describe the functions of various chemical components of the cell membrane. (08marks)
4. (a). Explain why asexual reproduction form offspring identical with the parents but sexually reproduced offspring show variation. (08marks)
- (b). Explain the significance of the following in crop production. (03 marks)
- (i) Inducing polyploidy. (04marks)
- (ii) Using seeds in crop propagation. (05marks)
- (c). In what ways is light important in crop growth and development? (05marks)
5. Explain the following observations.
- (a). A very little component of the ingested plant food material is absorbed and incorporated into our body than when the ingested food is from animal body. (05marks)
- (b). The guts of herbivorous mammals are relatively larger, longer and complicated than guts of omnivorous mammal such as humans. (05marks)
- (c). Populated human settlement areas are advised to use crop items as maize, beans etc. as source of food and firewood, charcoal, e.t.c as source of energy but not items like skin, fresh and bones from mammals. (05marks)
- (d). A good supply nitrates is essential to photosynthesizing food crops. (05marks)
6. (a). What is meant by species extinction? (02marks)
- (b). Explain human activities that may lead
- (i) to formation of new species in nature (03marks)
- (ii) to extinction of species (04marks)
- (c). Describe how variation, natural selection and isolation may contribute to formation of new species (11marks)