UNEB UACE BIOLOGY 2004

PAPER TWO

1. Graphs A,B and C show results of three experiments that were carried out to study the relationship between a predator, didinium and prey paramecium, under three sets of conditions.

In the first experiment, the paramecium was introduced into a culture at point P and Didinuim at point D as shown in graph A of figure 1.

In the second experiment, the paramecium and didinium were introduced together at point P+D at different population densities. This is shown in graph B of figure 1.

In the third experiment, paramecium and didinium were introduced together at point P+D at different densities and after every three days as shown by the arrows in graph C of figure 1.

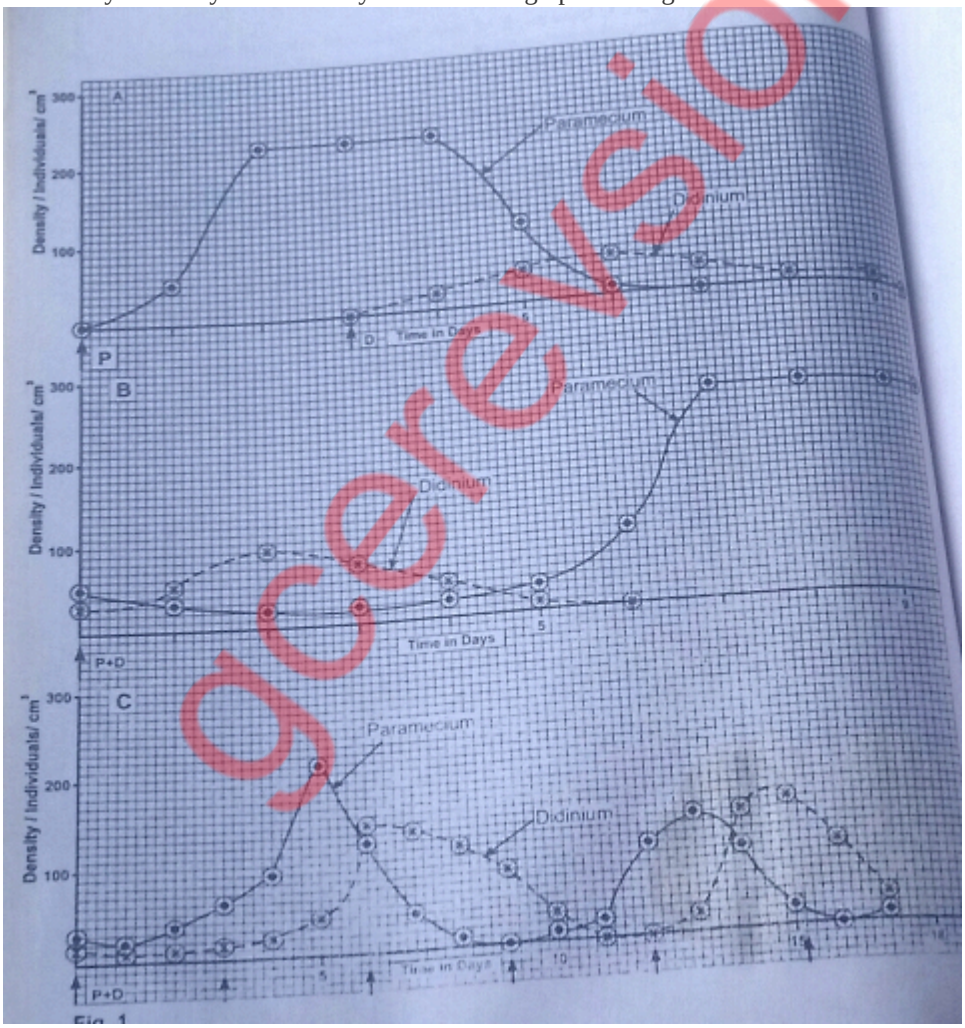

Fig. 1

a. Describe the trend of population growth of paramecium and didinium in graph
(i) A

(ii) B

(iii) C

b. Explain the interaction of the two species of organisms in graph
(i) A

(ii) B

c. Compare the trend of the population growth of the two species in graph B and C.

d. Supposing paramecium and didinium were introduced at the same time under natural environment conditions, sketch curves to show time expected trend of the populations with time.

e. Explain the trends of the population curves of paramecium and didinium you have drawn in (d)

SECTION B

2. Describe how xerophytes survive conditions of unfavorable water balance.

3. Giving an example, explain what is meant by discontinuous variation?

a. How does sexual reproduction cause variation?

b. Explain how the environment may influence the process of natural selection.

4. Using examples, explain the meaning of displacement activity.

a. What is the importance of each of the following forms of behavior to the survival of organisms in a community?
(i) Territorial behavior

(ii) Courtship behavior

5. Explain

a. The need for special respiratory surfaces and transport system pigments in higher animals.

b. How gaseous exchange occurs adequately in higher plants without transport system pigments.

6. What is biological pest control?

a. Explain the precautions to be taken in application of biological pest control.

b. Describe the ecological qualities of a good pesticide.