16 Ecosystem

Section A

[2010-3]

Figure 3 shows the carbon cycle. Use it to answer the questions that follow:

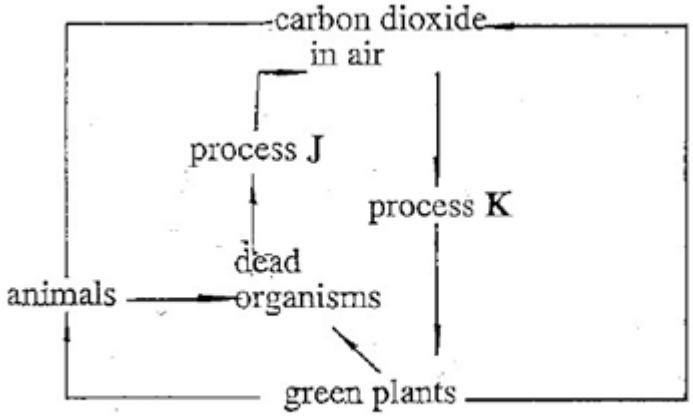

Figure 3

2010-3.

a. Name the processes **J** and **K**. (2 marks)

b. Mention one environmental problem that is caused by increased amounts of carbon in dioxide in the atmosphere. (1 mark)

[2007-4]

Figure 3 is a graph showing results of an experiment on the diet of two groups of rats. The graph is divided into three regions **A**, **B** and **C**. Use it to answer the questions that follow.

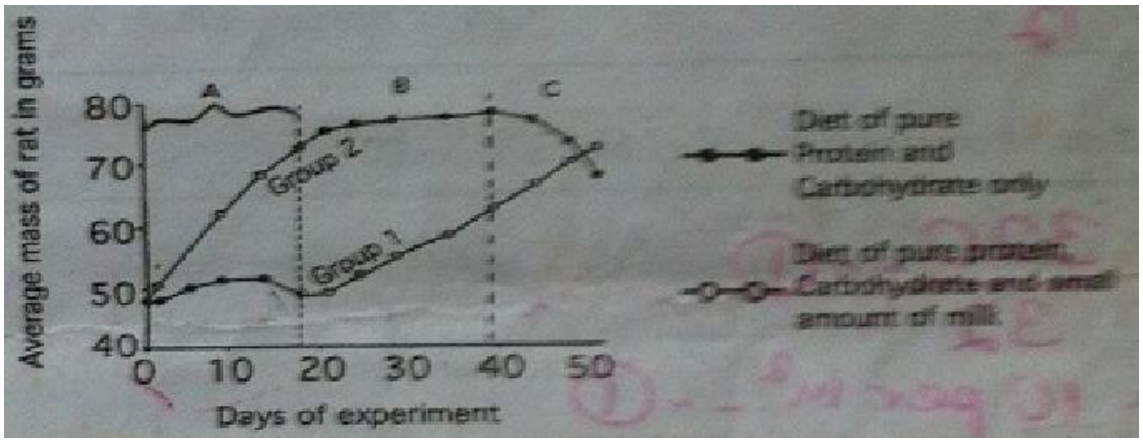

Figure 3

2007-4.

a. Describe what happened to the mass of group 2 rats in regions **B** and **C**.

(i) Region **B** (1 mark)

Explain your observation: (1 mark)

(ii) Region **C** (1 mark)

Explain your observation: (1 mark)

b. Mention any **two** variables that were kept constant during the experiment. (2 marks)

[2005-6]

Figure 2 is a diagram showing a food web in an aquatic ecosystem. Use it to answer the questions that follow.

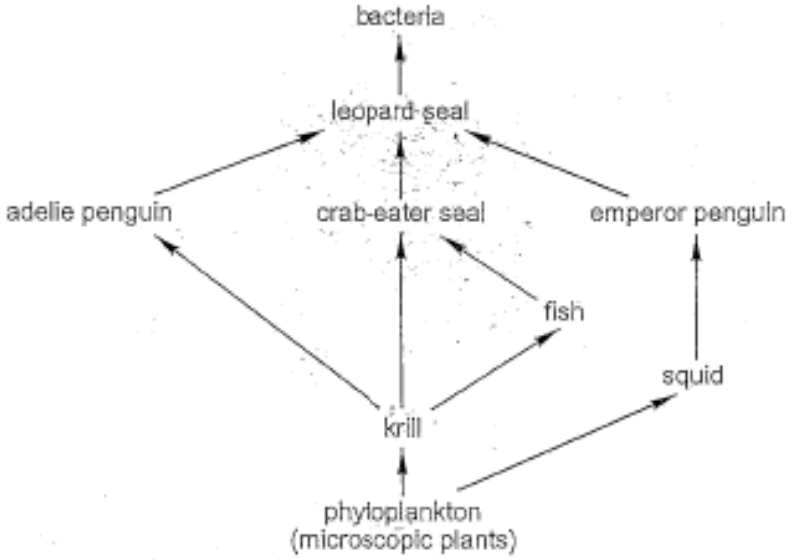

Figure 2

2005-6.

a. Name one organism which represents a:

(i) Herbivore (1 mark)

(ii) Decomposer (1 mark)

b. From the food web draw one food chain of six organisms. (2 marks)

c. Why would bacteria not belong to a specific feeding level? (1 mark)

2004-1.

a. Define the following terms:

(i) "ecosystem" (1 mark)

(ii) "community" (1 mark)

b. Suppose a particular ecosystem has 2 shrubs, 100 caterpillars and 3 birds, construct a pyramid of:

(i) number (1 mark)

(ii) biomass (1 mark)

2003-6.

a. Mention **one** abiotic factor that affects plant growth. (1 mark)

b. Give **two** way in which the activities of man can affect an aquatic ecosystem. (2 marks)

Section B

[2012-8]

Figure 5 shows one of the nutrient cycles in nature. Use it to answer the questions that follow.

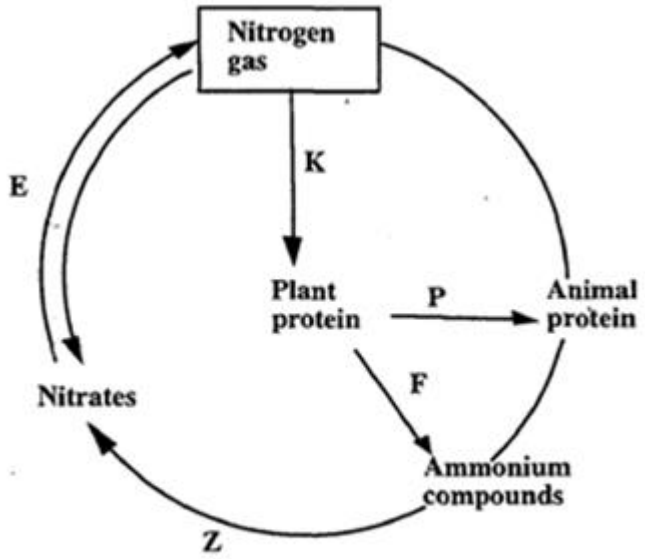

Figure 5

2012-8.

a. Name the processes taking place at **F**, **Z** and **P**. (3 marks)

b. Explain how the process at **K** takes place. (3 marks)

c. Under what conditions does the process at **E** take place? (1 mark)

[2010-13]

Figure 11 is a diagram showing recycling of materials in an ecosystem. Use it to answer the questions that follow.

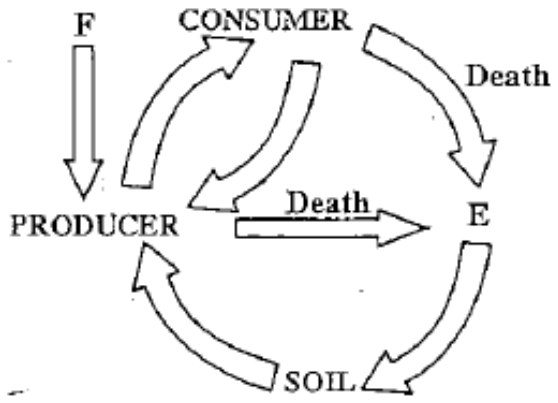

Figure 11

a. What does **F** represent? (1 mark)

b. Explain how the producer benefits from the activities of organisms represented by letter **E**. (3 marks)

[2009-13]

Table 2 shows results of an analysis of water in a stream and the organisms present in it. The stream was sprayed annually with an insecticide to kill larvae of mosquitoes. Use it to answer the questions that follow.

Table 2

Analysis	**Concentration of pesticide**
Stream water	2
Water plants	500
Fish type A	27,000
Fish type B	115,000
Fish eagles	160,000

2009-13.

a. Write down a food chain that includes all the organisms shown in the table. (3 marks)

b. Why is the insecticide concentration in the fish eagles higher than in the water plants? (2 marks)

[2008-7]

Figure 6 shows a closed aquarium which was set up in the sun by a group of students. Use it to answer the questions that follow.

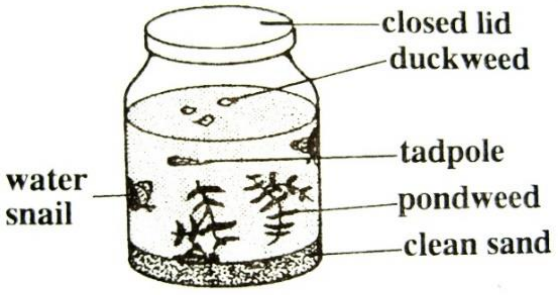

Figure 6

2008-7.

a. Besides feeding relationship, explain how the pond weeds and snails depend on each other in the aquarium. (4 marks)

b. If the following morning students observed that tadpoles and water snails had died explain the cause of death. (3 marks)

2007-5.

Student caught 64 grasshoppers in a school garden of area $32m^2$ and marked them with nail varnish. They released them into the same garden. After two hours the students captures 60 grasshoppers in the same area of which 12 had marks of nail varnish.

a. Name the sampling technique used by the students. (1 mark)

b. Calculate the total number of grasshoppers for this area. (3 marks)

c. Calculate the population density of the grasshoppers. (2 marks)

[2006-12]

Figure 9 is a diagram showing one of the relationships that exists among organisms in any ecosystem. Use it to answer the questions that follow.

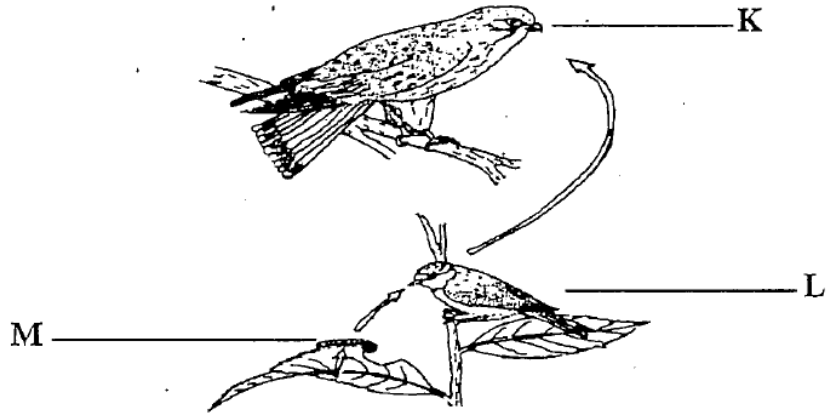

Figure 9

2006-12.

a.

(i) Name the type of relationship shown in **Figure 9**. (1 mark)

(ii) State **two** adaptations of organism **K** to survive in this relationship. (2 marks)

b. Explain briefly how organism **K** would be affected if the population of organism **M** was red. (2marks)

c. Apart from pesticide application, mention one way of reducing population of organism **M**. (1 mark)

[2004-7]

Figure 3 is a diagram showing recycling of materials in an ecosystem; Use it to answer the questions that follow.

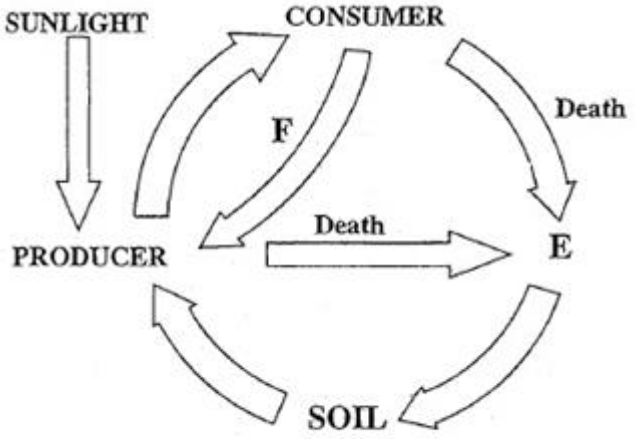

Figure 3

2004-7.

a. What do the letters **E** and **F** represent? (2 marks)

b. Explain how the consumer be affected if **E** was absent in the cycle. (3 marks)

c. How would a worm using the soil as a habitat benefit the producer? (3 marks)

[2004-9]

Figure 5 is a photograph of plant known as cactus. Use it to answer the questions that follow.

Figure 5

2004-9.

a.

(i) Suggest a possible environment where the plant in **Figure 5** would grow. (1 mark)

(ii) State **one** adaptation shown in the photograph which would assist the plant to survive in its habitat. (1 mark)

(iii) Explain how the adaptation in 9.a.(ii) would help the plant to survive in its habitat. (1 mark)

[2004-12]

Figure 6 shows cross-sections through stems **6A** and **6B** of two plant species. Use it to answer the questions that follow.

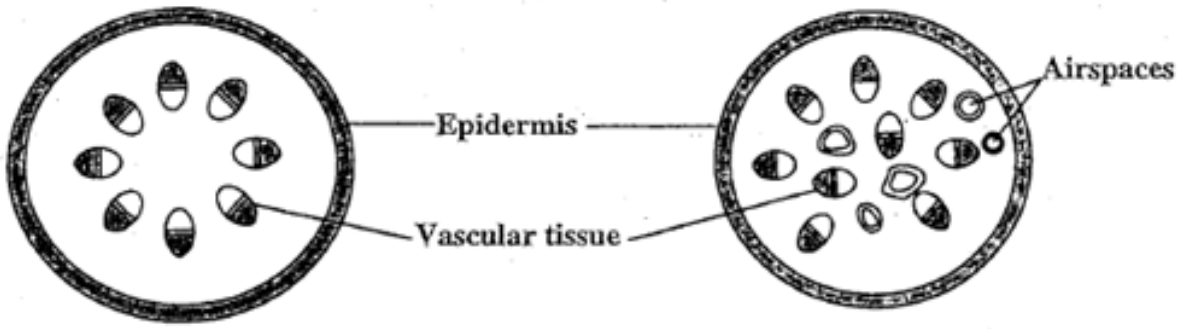

Figure 6A Figure 6B

2004-12.

a. State **two** structural between **Figure 6A** and **6B**. (2 marks)

b.

(i) Which cross-section belongs to an aquatic plant? (1 mark)

(ii) Explain your answer to 12.b.(i). (2 marks)

[2003-15]

Figure 7 is a graph showing the effect of untreated sewage on concentration of oxygen in a stream. Use it to answer the question that follow.

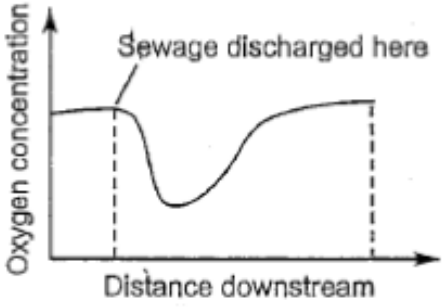

Figure 7

2003-15.

a. Describe the effect of untreated sewage on oxygen concentration from the point of sewage discharge as distance increases down stream. (2 marks)

b. Explain why there is a change in oxygen concentration from the point where sewage is discharged into the stream. (2 marks)

c. Suppose there were fish in the stream, what effect would untreated sewage have on the population of fish? Explain your answer.

Effect (1 mark)

Explanation (1 mark)

Section C

2009-16.

Suppose you are an environmental officer in an area where people are not aware of the causes of environmental degradation. Explain any **five** causes and effects of environmental degradation you would include in your advice to people in the area. Your answer should be in an essay form. (10 marks)

2008-15.

Discuss the energy flow in a tropical woodland. Your answer should be in essay form. (10 marks)

2007-13.

Describe how the population of a plant in an open field can be estimated. Write your answer in an essay form. (10 marks)

2003-18.

Design an experiment that would be used to estimate the density of grasshoppers in a school garden. (10 marks)