18.2 Biodiversity

Question Paper

Course	CIE A Level Biology
Section	18. Classification, Biodiversity & Conservation
Topic	18.2 Biodiversity
Difficulty	Easy

Time allowed: 30

Score: /20

Percentage: /100

Question 1a

Table 1 shows the total number of plant species, the total number of insect species and the number of habitats in three areas, **A**, **B** and **C**.

Table 1

Area	Total number of plant species	Total number of insect species	Number of habitats
A	6	5	1
B	15	23	4
C	362	70	12

Identify the area with the highest biodiversity.
Give reasons for your choice of area.

[3 marks]

Question 1b

Identify the area that is likely to be affected the most if the environment changes.

Give a reason for your choice of area.

[1 mark]

Question 1c

State **one** reason why it is important to conserve biodiversity in **all** three areas.

[1 mark]

Question 2a

Table 1 shows the results of pond sampling from two different ponds.

Table 1

Species	Pond A	Pond B
Stonefly nymph	12	1
Caddisfly larva	14	2
Bloodworm	0	25
Mosquito larva	0	53
Freshwater shrimp	15	19
Pond snail	17	3

Calculate the species richness for pond **A** and pond **B** in Table 1.

[1 mark]

Question 2b

The index of diversity for pond **B** is 2.83.

Using the formula below, calculate the index of diversity for pond **A**.

$$d = \frac{N\,(N-1)}{\sum n(n-1)}$$

[2 marks]

Question 2c

Explain why pond **B** has a higher species richness but a lower index of diversity than pond **A**.

[1 mark]

Question 2d

The species measured in Table 1 can all be used as 'indicator species'. This means that their presence or absence can provide information about the quality of the water they live in. Mosquito larvae and bloodworms are known for having a high tolerance for pollution, while mayfly and caddis fly larvae have a very low tolerance for pollution.

Use the information provided and the results in Table 1 to suggest why there is a difference in diversity index between pond **A** and pond **B**.

Explain how you reached your conclusion.

[2 marks]

Question 3a

When carrying out ecological sampling, state the **two** types of sampling that can be used to avoid bias on the part of the people carrying out the study.

[2 marks]

Question 3b

(i)
Define the ecological term *abundance*.

[1]

(ii)
Define the ecological term *distribution*.

[1]

[2 marks]

Question 3c

Some ecologists wishes to carry out quadrat sampling in a piece of parkland shown in Fig. 1.

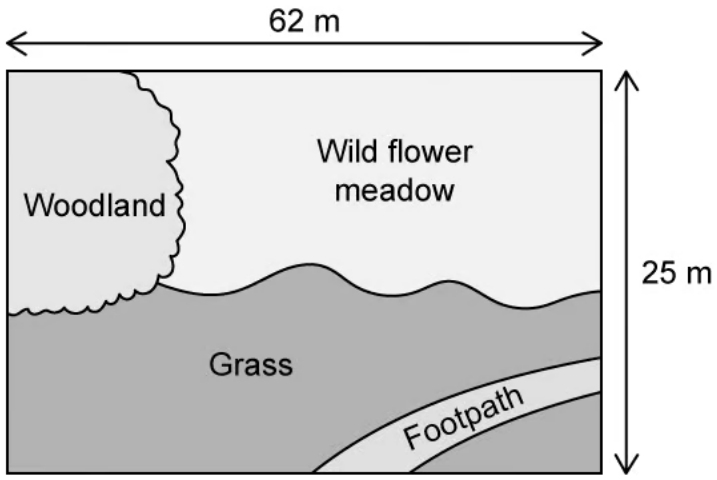

Fig. 1

The ecologists used square quadrats of 50cm × 50cm in size.

Calculate how many quadrats they would have to sample in order to perform 1% sampling of the field in Fig. 1.

[3 marks]

Question 3d

In the piece of parkland shown in Fig. 1, the ecologists noted that most human activity took place on the footpath and in its immediate vicinity.

They recorded a weak degree of correlation in the data. With increased distance away from the footpath came increased biodiversity of a particular region of the parkland.

Suggest a likely numerical value for the correlation coefficient that they calculated.

[2 marks]