

AS Level Biology A
H020/02 Depth in biology

Question Set 12

1. (a) A group of students were studying a local field, Upper End Meadow. The students sampled plants from this field.

The students' results are given in Table 1.

Species	<i>n</i>
Meadow buttercup	6
Common daisy	7
Red clover	3
Ribwort plantain	8

Table 1

- (i) Calculate the Simpson's Index of Diversity for Upper End Meadow.

Use the information in Table 1 and the formula:

$$D = 1 - \left(\sum \left(\frac{n}{N} \right)^2 \right)$$

n = number of organisms of this species

N = total number of organisms

Show your working. Give your answer to **two significant figures**.

Answer.....

[3]

- (ii) Name a piece of equipment that you could use for the random sampling of the plants shown in Table 1.

[1]

- (b) The group of students attempted to extract and purify DNA from a plant in Upper End Meadow.

The students used the following steps:

1. Mix the plant sample with detergent.
2. Add salt.
3. Add protease enzyme.
4. Spool the DNA precipitate onto a glass rod.

Suggest whether this method would successfully extract and purify DNA. Justify your conclusion.

[3]

(c) The students found 50 animals in a soil sample collected from Upper End Meadow and identified them as follows:

- 2 click beetles
- 24 leatherjackets
- 23 meadow ants
- 1 wireworm

What can you conclude about the species evenness shown in the soil sample? Justify your answer.

Conclusion

Justification

[1]

Total Marks for Question Set 12: 8

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