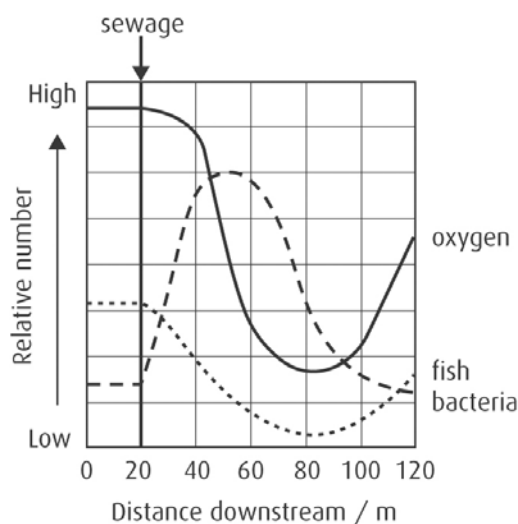


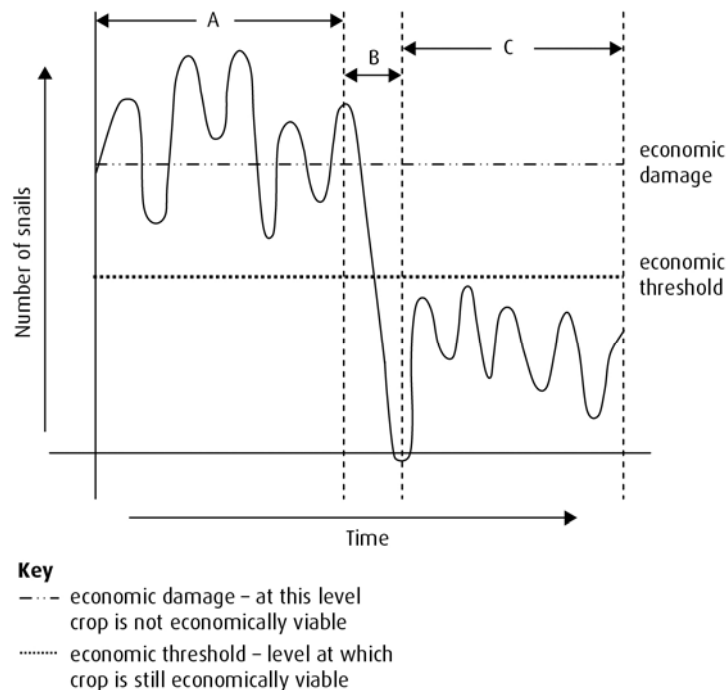
Extension worksheet – Option G

- 1 The graph shows the effect of sewage entering a river on the oxygen level and the relative numbers of bacteria and fish.



- a How is the number of bacteria affected by the sewage entering the river? (1)
- b i How is the fish population affected by the sewage entering the river? (1)
- ii What are the main reasons for this change? (2)
- c As the distance downstream increases, the concentration of sewage falls. Suggest **two** reasons for this. (2)
- d Invertebrates found in the stream are used as 'indicator species'. What is an indicator species? (1)
- e Suggest indicator species that might be found at 60 m and 120 m downstream from the sewage outfall. (2)
- f Why are indicator species sometimes a more accurate measure of environmental quality than simple measurement of abiotic factors? (2)

- 2 a** Introduced alien species can cause damage to native plants or crops. The graph shows how the population of introduced snails, which are a pest in a field growing crop plants, varied over a number of years.



- i** Suggest why the population of the snails changed over period A. (3)
 - ii** Was the livelihood of the farmer threatened by the snails at any time? Explain your answer. (2)
- b** Outline a suitable method that might be used to measure the population of snails. (2)
 - c** At the start of period B, a biological control species was introduced. Suggest a type of control species that could be used. (1)
 - d** Describe and explain the change in the snail population over period B. (2)
 - e** Suggest the most likely reason for the pattern of snail numbers over the period of time C. (1)
 - f** Discuss the probability that the snail population will be permanently controlled by this method. (2)

- 3 a Outline what is meant by the term ‘biodiversity’ in an ecosystem. (1)
- b Why is it important to maintain biodiversity in a rainforest? (2)
- c A survey was carried out to compare the invertebrates found in an area of rainforest and a deciduous woodland. The data are shown in the table below.

Species	Number of invertebrates found (<i>n</i>)	
	Rainforest site	Deciduous woodland site
A	3	6
B	0	3
C	20	8
D	18	2
E	7	2
F	8	3
G	19	4
H	9	4
I	10	2
J	5	7
K	15	3
L	9	5
Total (<i>N</i>)	123	
Simpson index <i>D</i>	9.30	

- i Calculate the Simpson index, *D*, for the deciduous woodland. (2)
- $$D = \frac{N(N-1)}{\sum n(n-1)}$$
- ii What differences are there in the biodiversity of the two sites? (2)
- iii Suggest possible reasons for the differences observed. (2)
- d It has been suggested that global warming may accelerate the loss of biodiversity. Give **two** reasons why this may be the case. (2)