20. Human influences on ecosystems

20.3 Pollution

Paper 1 and 2

Question Paper

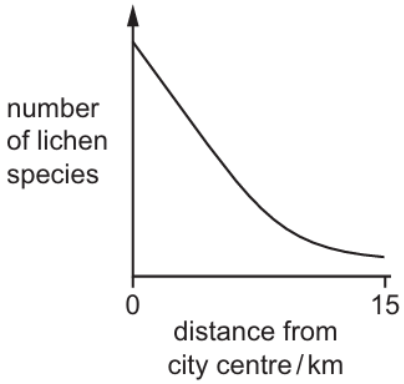
Paper 1

Questions are applicable for both core and extended candidates

1 Lichens are organisms that do **not** grow well in polluted air.

Which graph shows the change in the number of lichen species from the centre of a polluted city to the unpolluted countryside 15 km away?

A



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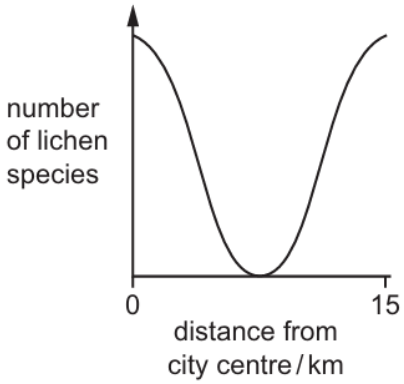

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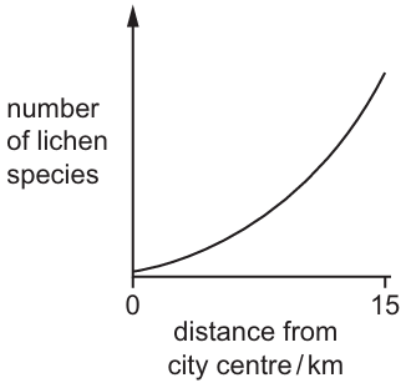

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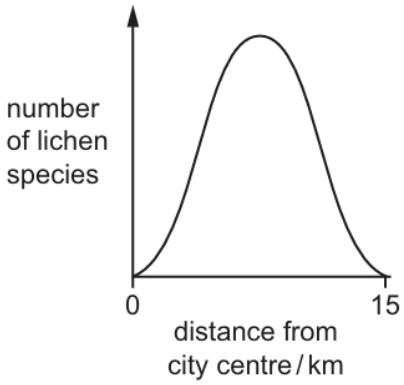


2 What are the effects of sewage pollution on the biodiversity and the number of bacteria in a river?

	biodiversity	number of bacteria
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

3 The increase of which gases contributes to an enhanced greenhouse effect?

A carbon dioxide and methane

B methane and nitrogen

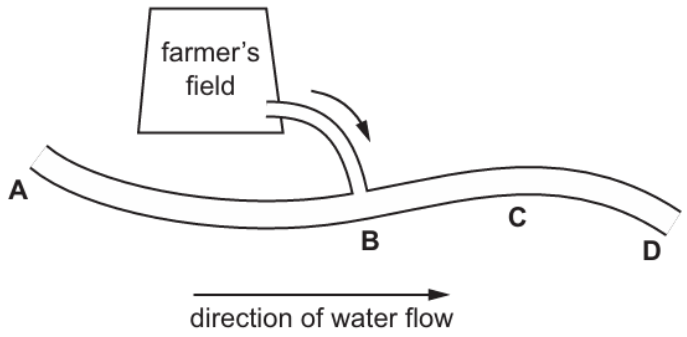
C nitrogen and oxygen

D oxygen and carbon dioxide

4 The diagram shows the position of a farmer's field near a river.

The farmer uses chemical fertilisers that drain into the river, causing pollution. High concentrations of the chemical fertiliser result in increased growth of aquatic plants.

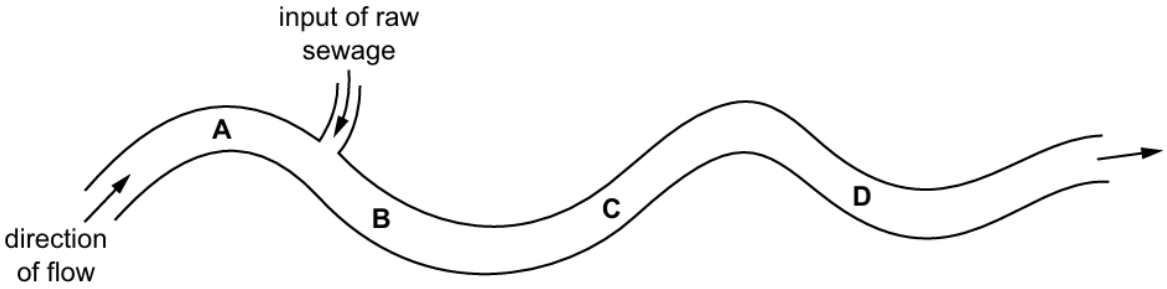
At which point is the growth of aquatic plants the **least** affected by fertilisers?



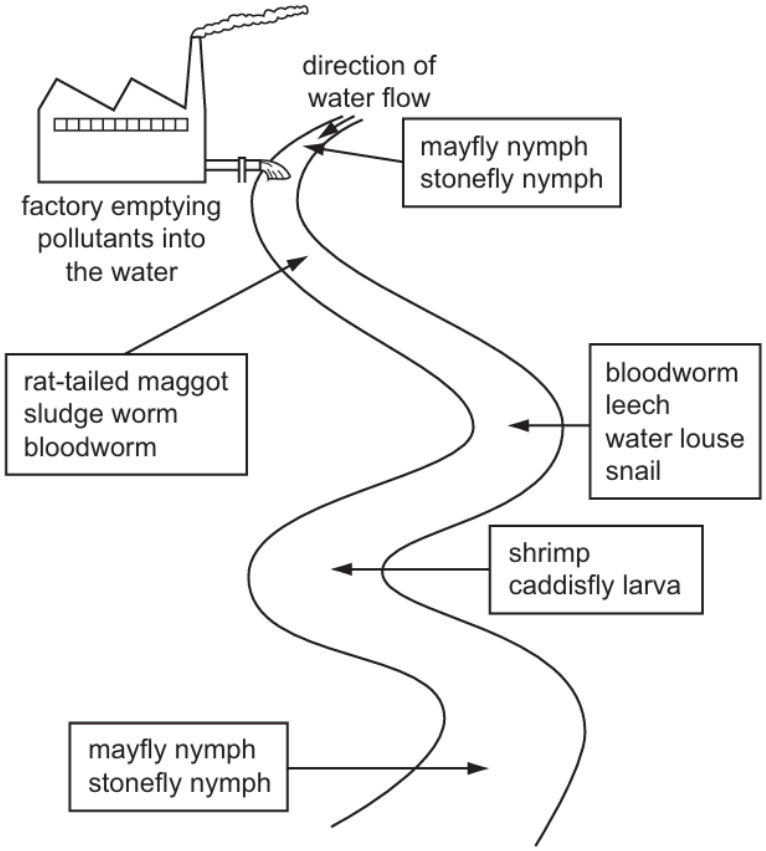
5 The bloodworm is an organism that is found in heavily polluted water.

The diagram shows where raw sewage flows into a river.

Where would there be fewest bloodworms?



6 The diagram shows the results of a survey on the types of animals found along a stretch of river near to a factory.



Which animal lives in the least polluted water?

A bloodworm

B caddisfly larva

C leech

D stonefly nymph

7 Which factors are believed to have contributed to the rise in sea levels?

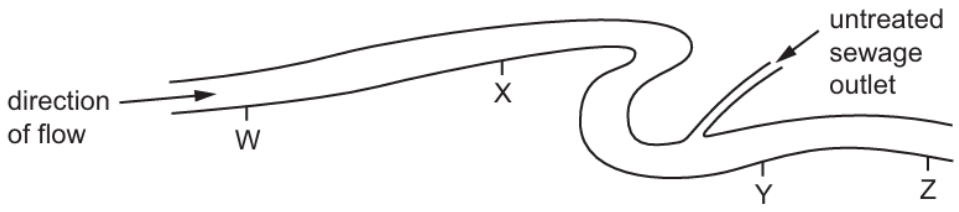
A pollution of the air by carbon dioxide only

B pollution of the air by carbon dioxide and methane

C pollution of the sea by plastics only

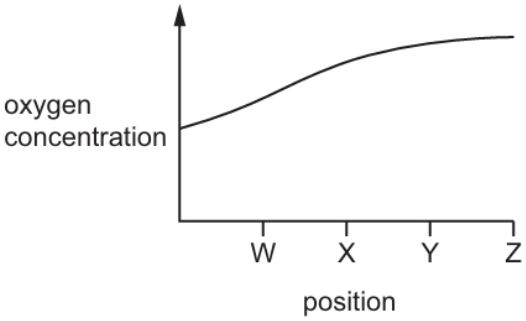
D pollution of the sea by insecticides and nuclear fall-out

8 The diagram shows four positions on a river where water samples were taken.



Which graph shows oxygen concentrations in the river?

A



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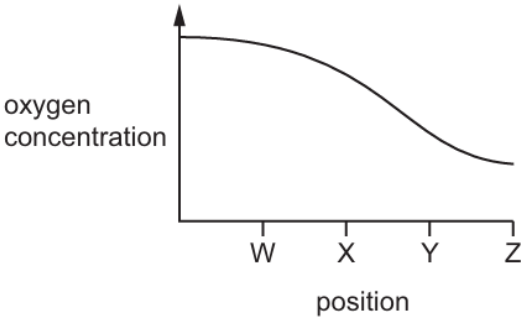

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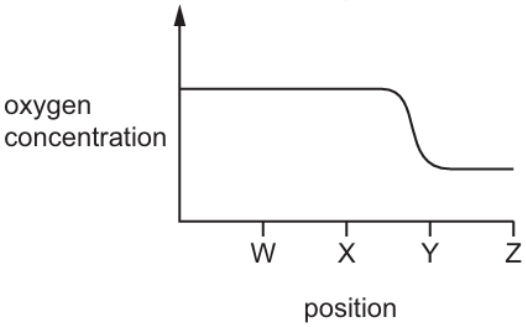

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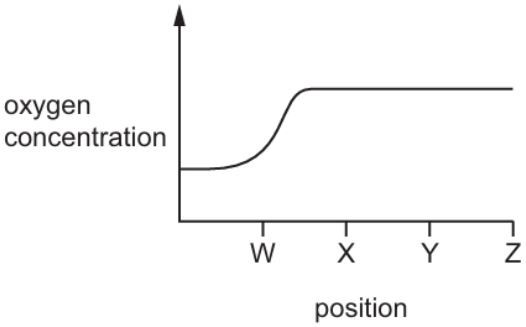


Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

9 A farmer has a small pond on their farm land.

One year, most of the organisms in the pond die.

The next year, the farmer decreases their use of nitrate fertilisers and fewer organisms in the pond die. **(extended only)**

Which statement explains why this will help **increase** the number of organisms living in the pond?

A There is a decrease in dissolved oxygen due to an increase in decomposition.

B There is a decrease in dissolved oxygen due to an increase in photosynthesis.

C There is an increase in dissolved oxygen due to a decrease in decomposition.

D There is an increase in dissolved oxygen due to a decrease in photosynthesis.

10 During eutrophication, what causes the death of fish? **(extended only)**

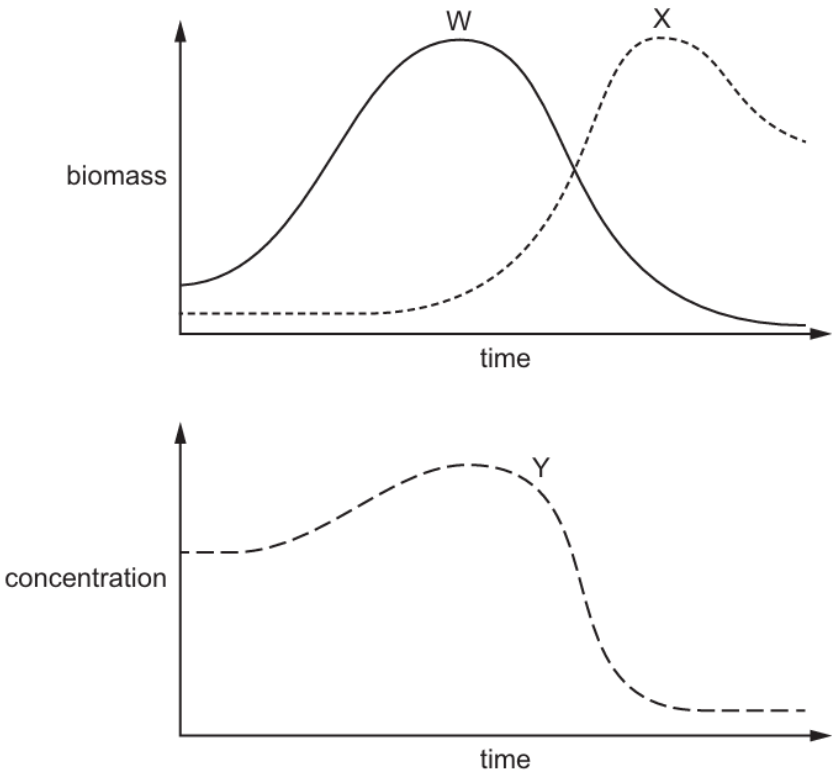
A increased growth of producers

B increased photosynthesis by producers

C decreased concentration of carbon dioxide in the water

D decreased concentration of oxygen in the water

11 The graphs show changes that occur in a lake during the process of eutrophication.



What are the labels for W, X and Y? **(extended only)**

	W	X	Y
A	decomposers	producers	oxygen
B	decomposers	producers	sulfur dioxide
C	producers	decomposers	oxygen
D	producers	decomposers	sulfur dioxide

12 If the nitrate concentration in a lake increases, fish may die due to the events listed.

1 increased aerobic respiration by decomposers

2 increased decomposition of dead producers

3 increased growth of producers

4 reduction in dissolved oxygen

Which sequence of events would lead to the death of the fish? **(extended only)**

A $1 \rightarrow 3 \rightarrow 2 \rightarrow 4$

B $2 \rightarrow 1 \rightarrow 4 \rightarrow 3$

C $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$

D $3 \rightarrow 4 \rightarrow 1 \rightarrow 2$

13 The process of eutrophication begins with the increased availability of nitrate ions and other ions in water.

The processes involved in eutrophication are listed.

1 increased aerobic respiration by decomposers

2 increased death of producers due to lack of light

3 rapid growth of producers

4 oxygen concentration in the water decreases and more organisms die

What is the correct sequence? **(extended only)**

A $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$

B $3 \rightarrow 4 \rightarrow 2 \rightarrow 1$

C $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$

D $4 \rightarrow 1 \rightarrow 3 \rightarrow 2$

14 The hormones from the female contraceptive pill can pollute water courses.

What effect do they have?

A decrease the amount of oxygen for fish

B decrease the sperm count of men

C increase the growth of producers

D increase the number of decomposers

15 When a river is polluted by fertiliser, the following processes may occur.

1 increased aerobic respiration of decomposers

2 increased growth of producers

3 decreased oxygen concentration in the water

What is the correct sequence for these processes? **(extended only)**

A $1 \rightarrow 2 \rightarrow 3$ **B** $1 \rightarrow 3 \rightarrow 2$ **C** $2 \rightarrow 1 \rightarrow 3$ **D** $2 \rightarrow 3 \rightarrow 1$

16 When nitrates enter a lake they cause rapid growth of algae on the surface of the water. This causes the following changes in the lake:

1 a decrease in the concentration of dissolved oxygen in the water

2 fish and other aquatic animals die

3 an increase in aerobic respiration by decomposers

4 producers die and decomposition increases

In which order do these changes occur? **(extended only)**

A 1 → 2 → 4 → 3

B 3 → 1 → 2 → 4

C 4 → 2 → 3 → 1

D 4 → 3 → 1 → 2

17 Pieces of plastic between 1 μm and 1 mm in size are called microplastics. Microplastics are put into some face creams and are produced during clothing manufacture. They can now be found in increasing quantities in oceans all over the world.

As well as their small size, which other property of microplastics make them dangerous to living organisms?

A They are lightweight.

B They are non-biodegradable.

C They are non-reactive.

D They are toxic.

18 The statements describe some of the events that occur during eutrophication.

What is directly responsible for the increase in bacteria? **(extended only)**

A a decrease in dissolved oxygen concentration

B an increase in nitrate concentration

C an increase in the population of algae

D an increase in the death of producers