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ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 Management in Context **October/November 2024**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

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[Turn over

world map showing the location of Türkiye (Turkey)



map of Türkiye (Turkey)

Key

★ capital city

• major city

----- international boundary

N

0 50

km



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Area of Türkiye: 783 562 km^2

Population of Türkiye: 83.0 million (in 2022)

Children per woman: 1.93 (in 2022)

Life expectancy: 76.21 years

Currency: Turkish Lira (16.57 TRY = 1 USD in 2022)

Language: Turkish, Kurdish

Climate of Türkiye: dry climate with hot summers, warm wet winters near the coasts, cold winters in the centre of the country

Terrain of Türkiye: many mountains with an area of high flat land in the centre; narrow areas of low land near the coasts

Main economic activities of Türkiye: tourism, coal, metal and mineral extraction, textiles, agriculture including apricots and hazelnuts

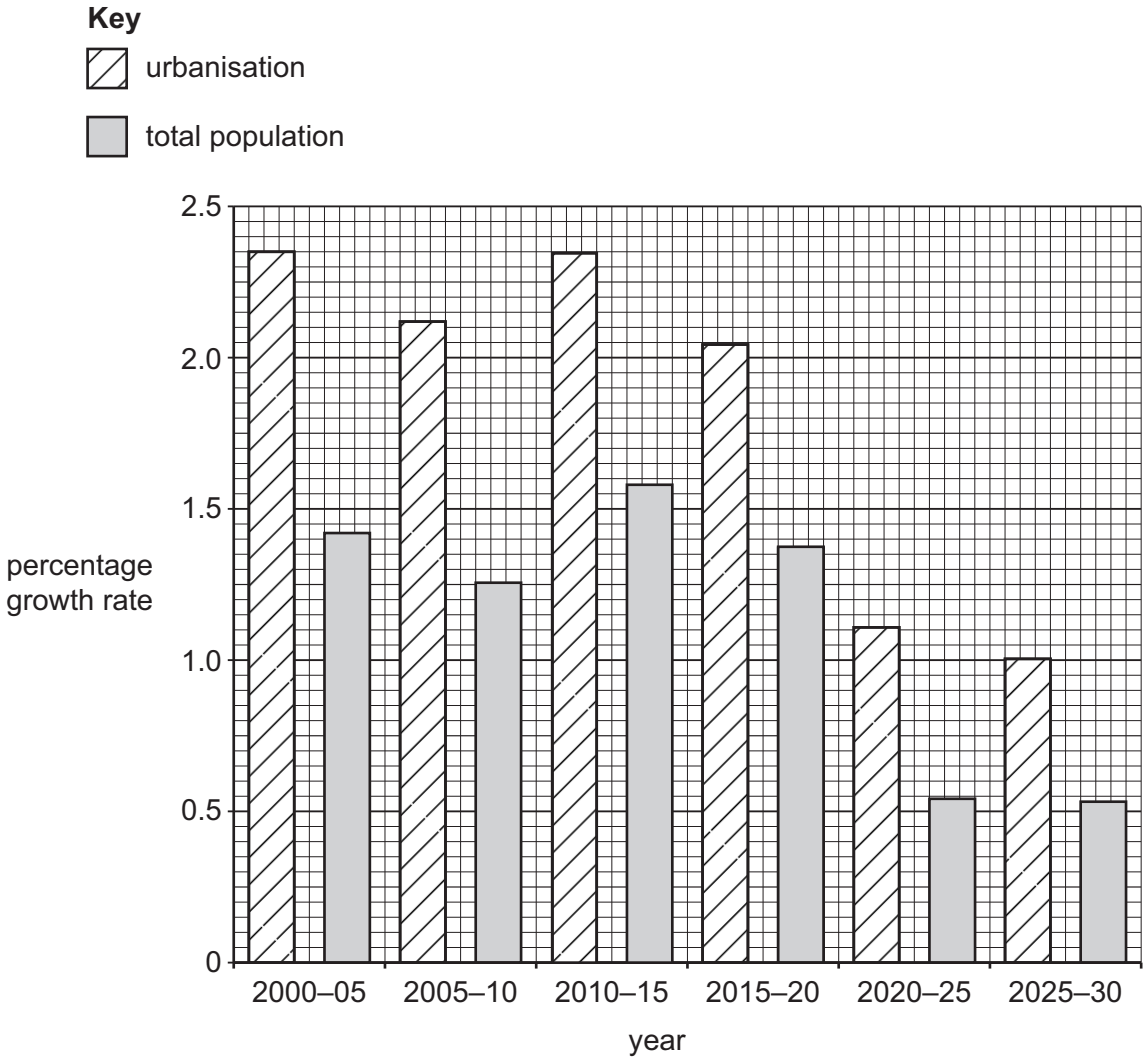
The capital city Ankara had a population of 5.1 million in 2022. Istanbul is the largest city, with 20% of the population. In Türkiye, 32% of the population are unemployed. 100% of the population have access to electricity. Türkiye's climate attracts many tourists. Earthquakes, landslides and flooding are frequent natural hazards.

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1 **(a)** Calculate the number of people who lived in Istanbul in 2022.

..... million [1]

(b) The bar chart shows the percentage growth rates of urbanisation and of total population in Türkiye since 2000 and the estimated rates up to 2030.



Compare the data shown in the bar chart.

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(c) Urbanisation can increase atmospheric pollution.

Flue-gas desulfurisation is one strategy to reduce atmospheric pollution.

(i) Name the atmospheric pollution this strategy reduces.

..... [1]

(ii) Describe how flue-gas desulfurisation reduces atmospheric pollution.

.....

.....

.....

..... [2]

(d) Net migration rate is the difference between the number of people moving into a country and the number of people moving out of a country.

The net migration rate for Türkiye in 2021 was –1.55 per 1000 people.

Suggest why the net migration rate for Türkiye is negative.

.....

..... [1]

(e) The population pyramid of Türkiye is typical of an MEDC.

State **two** characteristics of an MEDC population pyramid.

1 .....

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2 .....

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[2]

(f) Explain why improved education can lower birth rates.

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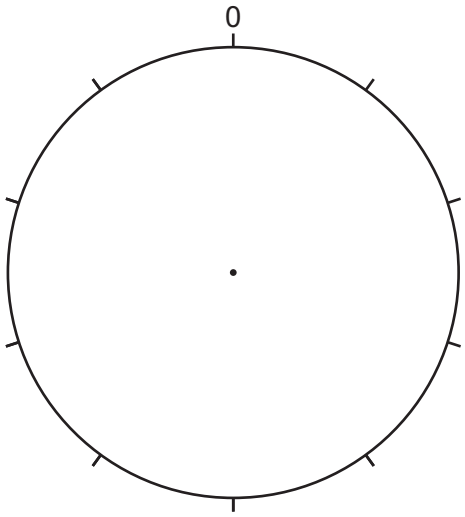
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[Total: 12]

2 **(a)** A report records how land is used in Türkiye.

land use	percentage of land
arable	30
pastoral	20
other	35
forest	15

Plot the data in the table as a pie chart and complete the key.



Key

.....

.....

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.....

[4]

(b) Wildfires have destroyed forests in Türkiye for thousands of years.

(i) State **three** other causes for deforestation.

1 .....

2 .....

3 .....

[3]

(ii) Two impacts of deforestation are a decrease in habitat and loss of biodiversity.

State **two** other impacts.

1 .....

2 .....

[2]

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(c) In 2020, a report stated that Türkiye imported 10.3 million tonnes of waste from other countries. Most of this waste became landfill or was incinerated.

(i) Suggest **one** benefit to Türkiye of importing waste.

.....

..... [1]

(ii) Suggest **two** negative impacts to Türkiye of importing waste.

1 .....

.....

2 .....

.....

[2]

(d) Landscapes damaged by mining can be used as landfill sites.

Explain how bioremediation restores landscapes damaged by mining.

.....

.....

.....

..... [2]

(e) Türkiye plans to increase recycling of its domestic waste.

Suggest **two** ways recycling can be encouraged.

1 .....

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2 .....

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[2]

(f) Recycling is a strategy to increase the sustainable use of materials.

State the meaning of sustainability.

.....

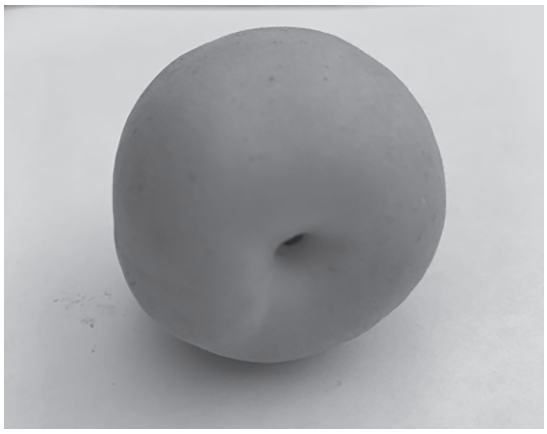
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3 Türkiye is the world's largest producer of apricots.

A farmer grows apricots to sell. The photograph shows an apricot fruit.



(a) State the term used for crops produced to be sold for a profit.

..... [1]

(b) Apricot trees are producers.

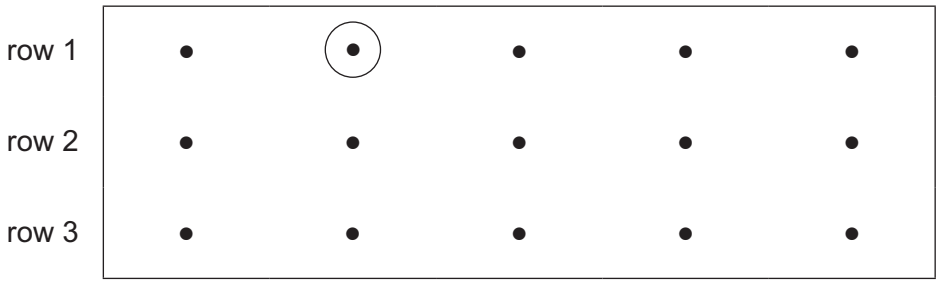
Explain why all the energy in a producer is **not** available to primary consumers in a food chain.

.....

..... [1]

(c) A farmer grows four different varieties of apricot tree, **A** – **D**. Each variety is grown in a different field.

The diagram shows a plan of variety **A** in one field.



The farmer investigates which variety produces the largest mass of apricot fruits.

The farmer uses this method to sample the trees:

- start at the beginning of each row
- sample every second apricot tree in each row
- sample a total of 6 trees.

(i) Circle the apricot trees the farmer samples in each row. The first tree has been done for you. [1]

(ii) Name this method of sampling.

..... [1]

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(d) The farmer samples four apricot fruits from each variety of tree.

The table shows the results.

variety	mass of apricot fruit / g			
	apricot 1	apricot 2	apricot 3	apricot 4
A	45	42	44	42
B	59	58	57	59
C	47	45	48	4
D	51	50	49	48

(i) Identify the anomalous result in the data.

variety .....

apricot .....

[1]

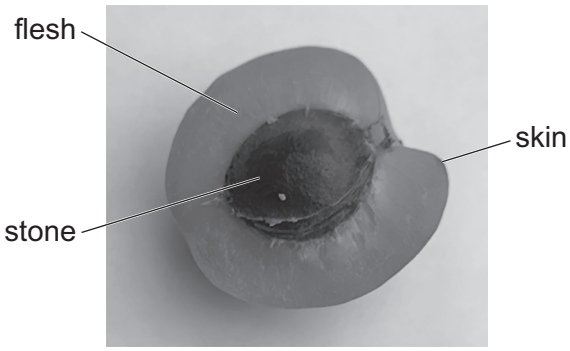
(ii) Calculate the range for variety **D**.

range = ... g [1]

(iii) Calculate the mean mass for variety **A**.
Give your answer to the nearest whole number.

mean = ... g [2]

(iv) The photograph shows parts of an apricot fruit.



Variety **B** has the largest mean mass of apricot fruit.

Farmers want apricot fruits with the largest mass of flesh.

Describe how the farmer can confirm that variety **B** has the largest mass of flesh.

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..... [2]

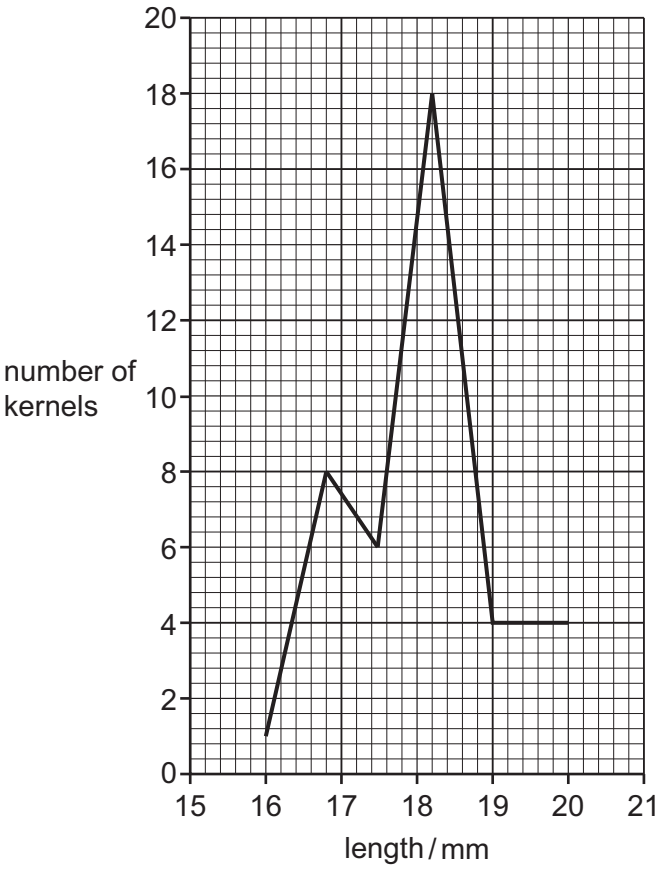
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(e) A scientist investigates apricot kernels.

The photograph shows apricot kernels.



The graph shows data about the length of apricot kernels.



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(i) State the minimum length of apricot kernels.

minimum length = ... mm [1]

(ii) State how many apricot kernels have the maximum length.

number of kernels = ... [1]

(iii) State the length which has the greatest number of kernels.

length = ... mm [1]

(iv) Uncooked apricot kernels contain a chemical which converts to cyanide after the kernel is eaten. Cyanide is toxic.

Some countries recommend that the maximum mass of apricot kernels an adult should eat is 0.37 g per day.

The scientist found the mean mass of an apricot kernel was 0.17 g.

Calculate the maximum number of apricot kernels that are safe to eat.

maximum number = ... [1]

(f) Many apricot fruits are processed to remove their stones and kernels.

Oil can be extracted from apricot kernels. The oil is a biofuel.

Suggest how extracting this oil makes apricot processing a sustainable activity.

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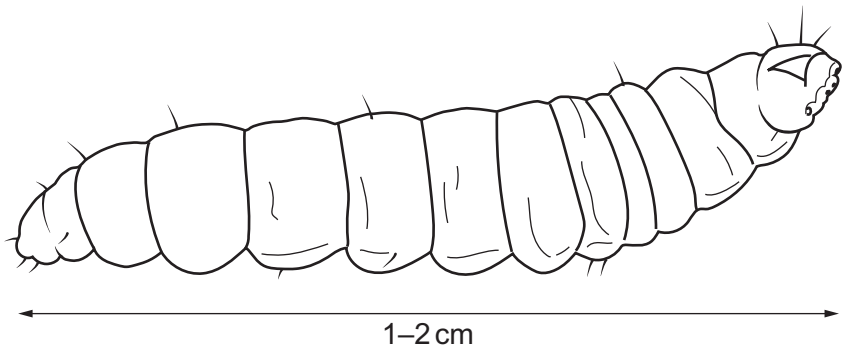
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(g) Oriental fruit moth, *Grapholita molesta*, is an insect pest of the apricot tree in Türkiye.

The diagram shows the Oriental fruit moth larva.



Insecticides are used to reduce the impact of the Oriental fruit moth larvae.

(i) Suggest **two** reasons why some farmers do **not** use insecticides.

1 .....

.....

2 .....

.....
[2]

(ii) Monitoring traps are attached to apricot trees to check for the Oriental fruit moth.

The traps contain a natural chemical that attracts Oriental fruit moths.

Suggest how the monitoring traps reduce the quantity of insecticide used on apricot trees.

.....

..... [1]

(h) Pollination is part of apricot tree reproduction.

Circle the part of an apricot flower that produces pollen grains.

anther **fruit** **stem** **stigma** [1]

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4 Lake Tuz is a large saltwater lake in Türkiye.

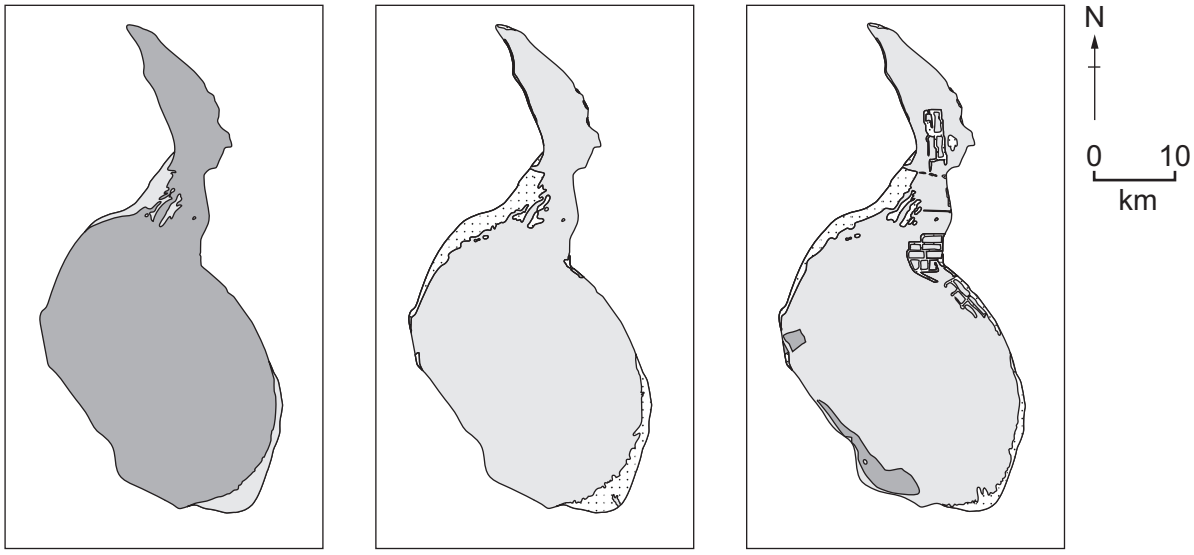
(a) The diagrams show aerial views of Lake Tuz from 1988 to 2020.

Key

saltwater

marsh land

salt deposits



1988 2016 2020

(i) Describe how the lake changes between 1988 and 2020.

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..... [3]

(ii) Suggest **three** reasons for the changes shown in the diagrams.

1 .....

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2 .....

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(b) The soil around Lake Tuz contains a high concentration of salt. Many plants cannot grow in salty conditions.

Describe how genetic modification allows plants to grow in areas of high salt concentrations.

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(c) The photograph shows flamingo birds at Lake Tuz.



It is estimated there are up to 35 000 flamingos at the lake.

A conservationist uses three different methods to estimate the population of flamingos at the lake.

method 1

- Take a photograph of the lake from the air.
- Divide the photograph into a grid of 100 squares.
- Count the number of flamingos in 10 squares.

method 2

- Count the number of flamingos seen flying in the sky above the lake on one day.

method 3

- Walk around the lake and count the number of flamingo nests.

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(i) Explain how the total number of flamingos can be estimated using method 1.

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..... [2]

(ii) Suggest **two** limitations of method 2.

1 .....

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2 .....

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[2]

(iii) Suggest **two** limitations of method 3.

1 .....

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2 .....

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[2]

(d) Describe how captive breeding can increase the population of flamingos in the wild.

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..... [2]

(e) Suggest **two** strategies to increase the population of flamingos in the wild, other than captive breeding.

1 .....

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2 .....

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[2]

[Total: 19]

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5 Marine mucilage is a very thick and sticky organic material that floats on the surface of sea water. It has similar properties to oil. Strategies for dealing with oil spills are used to control the impact of marine mucilage.

(a) The photograph shows equipment used to control the impact of marine mucilage on the Marmara Sea in Türkiye.



(i) State the name of the equipment used to control the marine mucilage shown in the photograph.

..... [1]

(ii) Suggest how marine mucilage kills marine animals.

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..... [2]

(iii) Suggest ways marine mucilage impacts human activities in Türkiye.

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(b) Marine mucilage forms when nutrient-rich sewage enters sea water.

Chlorination is a stage in sewage treatment.

(i) State the purpose of chlorination.

..... [1]

(ii) Name **one** risk to human health of drinking water **not** treated by chlorination.

..... [1]

(c) Nutrient enrichment of lake water can cause eutrophication.

The stages of eutrophication are shown.

A Aquatic animals suffocate and die.

B Algae rapidly increase in number and bloom in the water.

C Bacteria increase in number as they decompose dead water plants.

D Bacteria use up the oxygen content of water when they respire.

E Sunlight cannot reach water plants.

F Water plants cannot photosynthesise and die.

Put the stages of eutrophication in the correct order. Two have been done for you.

				D	**A**

[2]

(d) State the word equation for respiration.

..... [2]

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