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1360133771

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **May/June 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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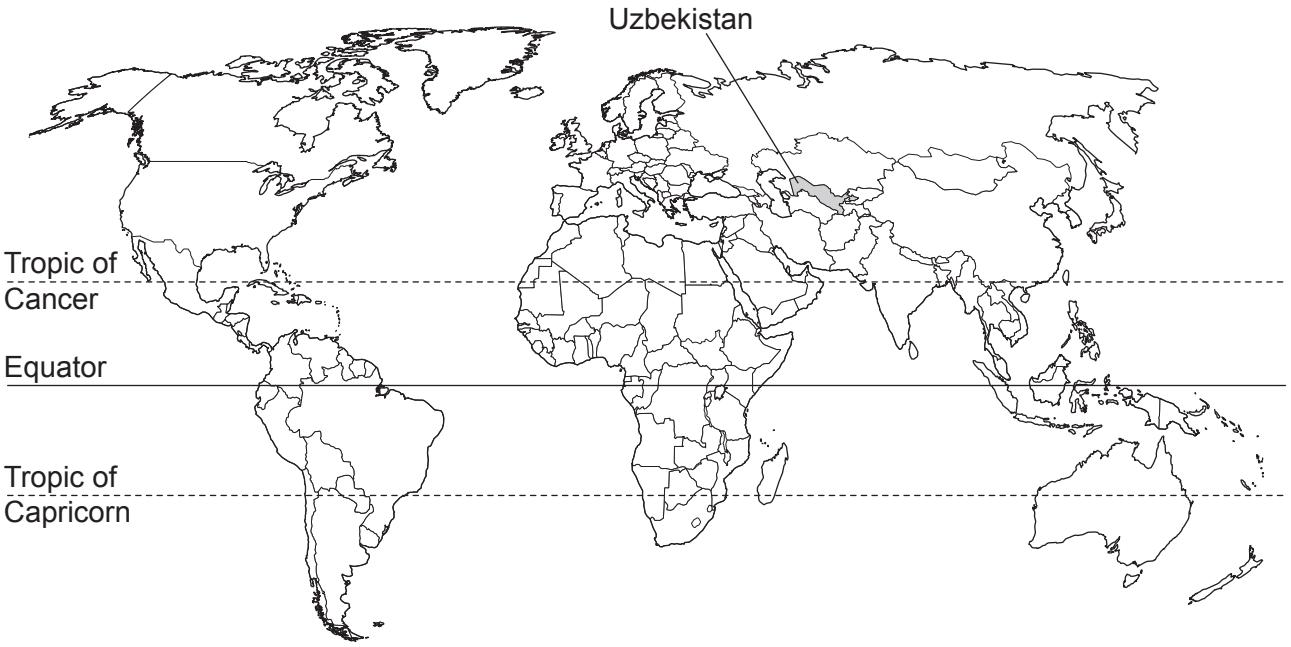
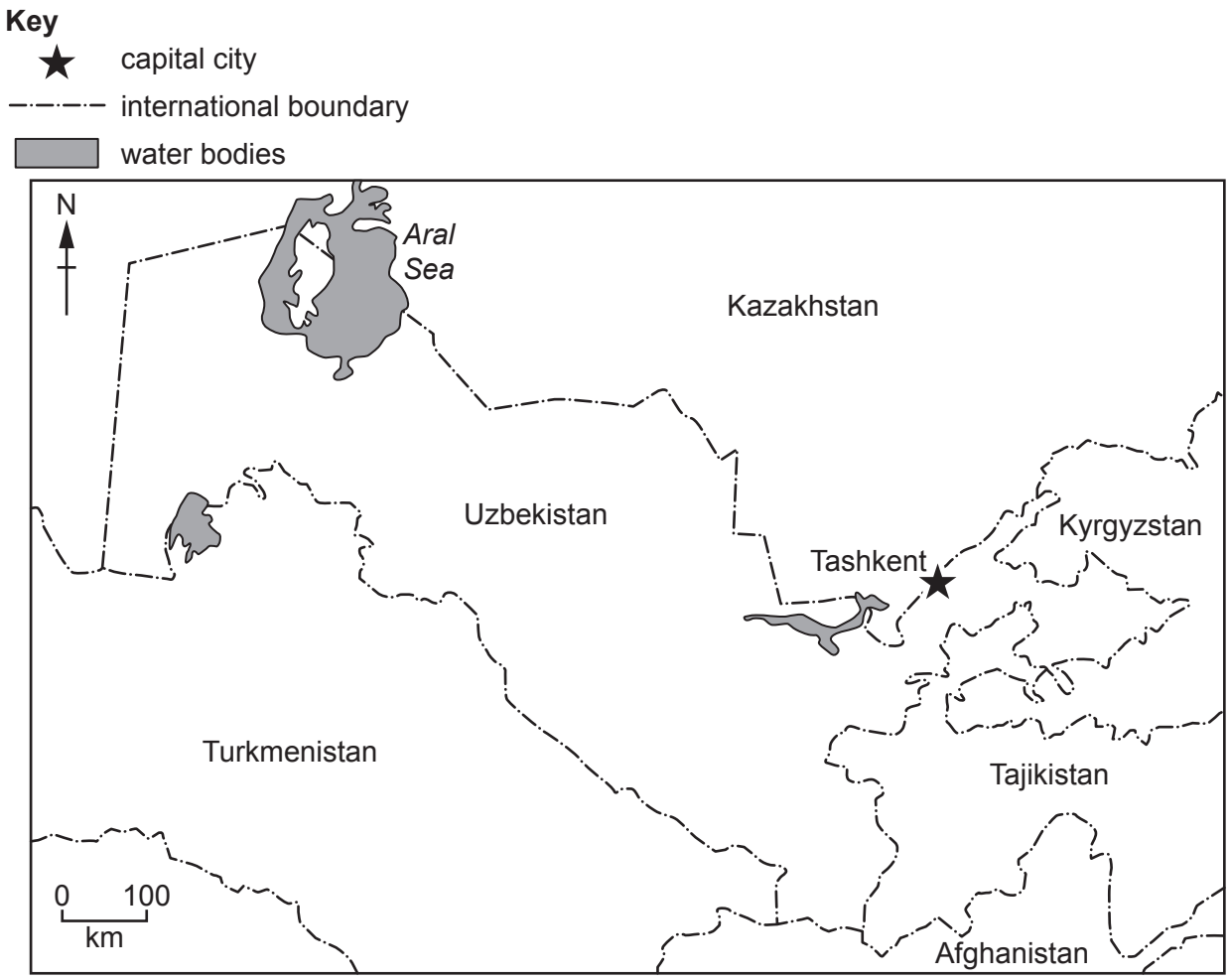
[Turn over

world map showing the location of Uzbekistan



map of Uzbekistan



Area of Uzbekistan: 447 400 km^2

Population of Uzbekistan: 31 million (in 2021)

Children per woman: 1.73 (in 2021)

Life expectancy: 75.0 years

Currency: Uzbek Som UZS (10 755 UZS = 1.00 USD)

Language: Uzbek, Russian, Tajik

Climate of Uzbekistan: dry**,** long hot summers, cold winters

Terrain of Uzbekistan: mostly flat sandy desert with dunes, river valleys in east, Aral Sea in north west

Main economic activities of Uzbekistan: textile and chemical manufacturing, food processing, engineering, mining and oil extraction

51% of the population live in urban areas. The valleys in the east are the most densely populated.
The valleys are also good for agriculture. Cotton is an important crop. Uzbekistan is the world's fifth largest cotton exporter.

[Turn over

1 **(a)** **(i)** Calculate the population density in Uzbekistan in 2021.

..... people / km^2 [1]

(ii) 51% of the population of Uzbekistan live in urban areas.

Suggest **two** reasons why the population is **not** evenly distributed across the country.

1 .....

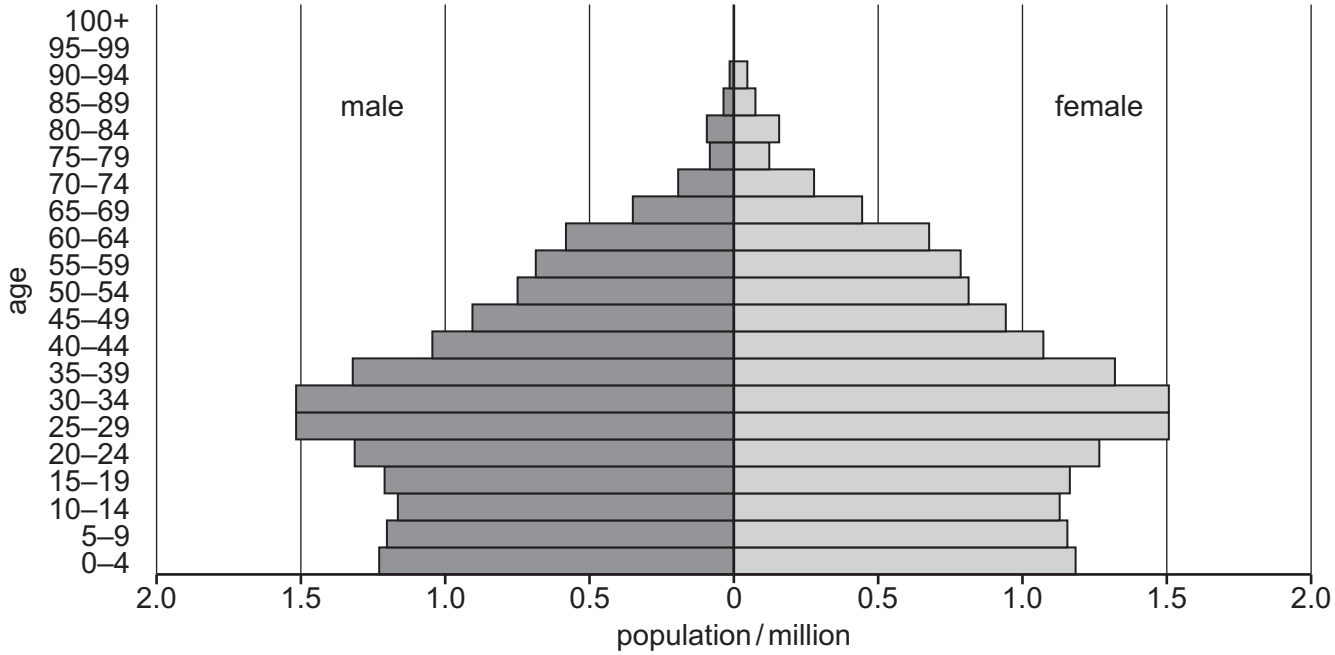
.....

2 .....

.....

[2]

(b) The diagram shows the population pyramid for Uzbekistan in 2021.



(i) Calculate the number of females between the ages of 25 and 34.

..... million [1]

(ii) Compare the population of males to females in the age ranges:

0–54 years .....

.....

55–100+ years. .....

.....

[2]

(iii) The birth rate of Uzbekistan has decreased in the past 30 years.
Suggest **two** reasons why there are fewer people aged 10–14 than people aged 25–29.

1 .....

.....

2 .....

.....

[2]

(iv) Suggest how a reduction in birth rate affects the economy of a country in the future.

.....

.....

.....

..... [2]

(c) The table compares three economic sectors in Uzbekistan.

economic sector	percentage of people employed	percentage contribution to the economy
agriculture	25.9	17.9
industry	13.2	33.6
services	60.9	48.5

State the economic sector which produces the greatest percentage contribution to the economy per person employed.

..... [1]

(d) Improving irrigation systems increases agricultural yields.

State **three** other ways to increase agricultural yields.

1 .....

.....

2 .....

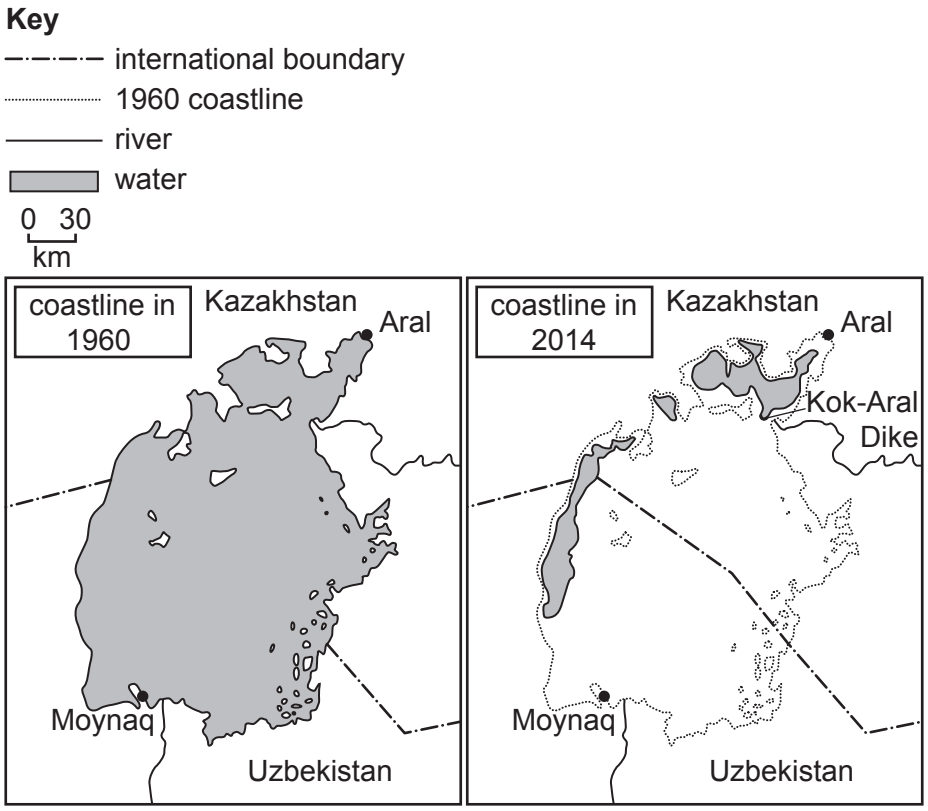
.....

3 .....

.....

[3]

(e) The Aral Sea is an area of salt water in Uzbekistan.
The size of the Aral Sea has changed over time.
The maps show this change.



(i) Calculate the straight-line distance from Aral to Moynaq in km.

distance = ... km [1]

(ii) In 1960, the volume of the Aral Sea was 1100 km^3.
In 2014, the volume was 95 km^3.

Calculate the percentage decrease in the volume between 1960 and 2014.

.....% [2]

(iii) Suggest how the changes in the Aral Sea have affected the economic activities of the people of Moynaq.

.....

.....

.....

..... [2]

(iv) Increased use of water to irrigate crops caused the decrease in the size of the Aral Sea.

State **three** ways farmers can use water more efficiently.

1 .....

.....

2 .....

.....

3 .....

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[3]

(v) The salinity has increased in the Aral Sea.

A scientist is concerned this has affected the biodiversity.

Describe how the scientist can randomly sample the Aral Sea.

.....

.....

.....

..... [2]

(vi) The scientist repeats the sampling at different times of the year.
Suggest **two** benefits of repeat sampling.

1 .....

.....

2 .....

.....
[2]

(vii) The table shows the data from two identical sampling investigations of the Aral Sea.

	sampling year	
	1960	**2014**
mean salinity / arbitrary units	10	135
number of fish species	25	28
number of shellfish species	13	6
number of plant species	40	22

Write a suitable conclusion about the effect of salinity on the number of species in the Aral Sea.

.....

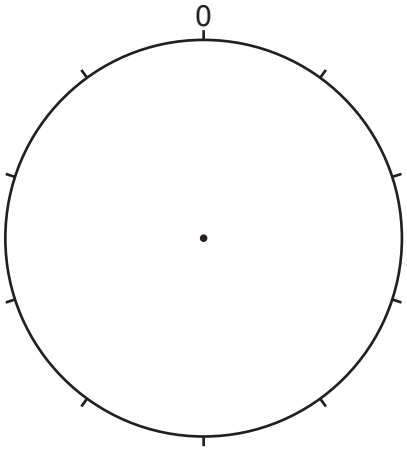
..... [1]

(f) Cotton is a major crop in Uzbekistan.

The table shows the percentage of water used at each stage of the production of cotton textiles.

production process	**percentage of water use**
crop irrigation	33
processing	25
colouring	23
finishing	19

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



Key

.....

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[4]

(ii) A student reads some information about the production of cotton textiles and synthetic textiles.
The synthetic textiles are made from oil.

	resources used to make 1 kg of textile	
textile	**energy use / MJ**	**water use / dm^3**
cotton	49	10 000
synthetic	109 000	10

The student concludes that the synthetic textile is less harmful to the environment.

Do you agree with the student's conclusion?
Use the information in the table to support your answer.

.....

.....

.....

..... [2]

[Total: 33]

2 **(a)** The government of Uzbekistan has introduced strategies to conserve biodiversity.

One strategy is a biosphere reserve in an area close to the Aral Sea.

(i) Explain how biosphere reserves conserve biodiversity.

.....

.....

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.....

.....

..... [3]

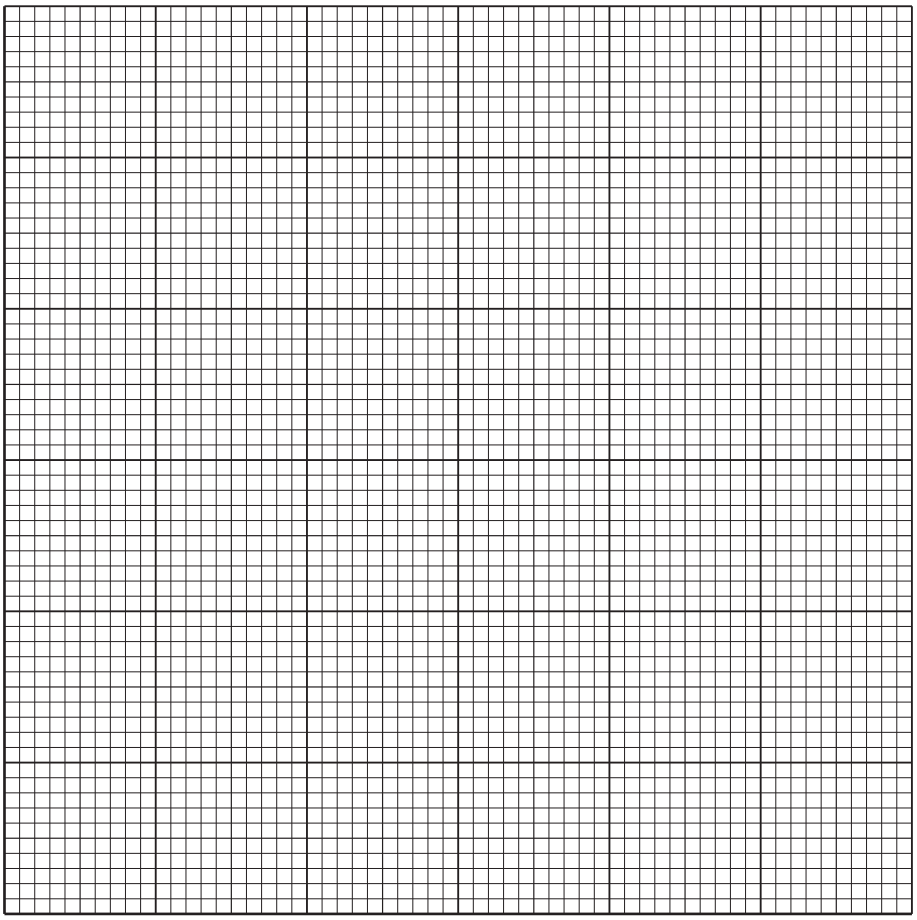
(ii) The photograph shows a Bukhara deer.

They prefer to live in large groups in the biosphere reserve.

Scientists recorded the number of Bukhara deer in the biosphere reserve.

year	1980	2000	2010	2015	2020
Bukhara deer population	20	58	500	750	2100

Plot a line graph of the data.



[4]

(b) A scientist is concerned that the population of Bukhara deer is now greater than the carrying capacity of the biosphere reserve.

(i) Define the term carrying capacity.

.....

..... [1]

(ii) Suggest what will happen if the Bukhara deer population continues to increase in the biosphere reserve.

.....

.....

.....

..... [2]

(c) Scientists want to move some Bukhara deer to a new location to start a new population. The location is a disused surface mine.

(i) Describe what must be done to this disused surface mine before the Bukhara deer are introduced.

.....

.....

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.....

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..... [3]

(ii) Suggest the benefits and negative impacts of introducing Bukhara deer to a new location.

benefits .....

.....

.....

.....

.....

.....

negative impacts .....

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.....

.....

[4]

[Total: 17]

3 **(a)** Uzbekistan is rich in energy resources.

The table shows reserves of energy resources and their annual extraction.

energy resource	reserves / arbitrary units	annual extraction / arbitrary units	remaining supply / years
natural gas	2240	60.0	37.3
oil	178	0.7	.....
coal	1950	4.0	487.5
uranium	97	3.6	26.9

(i) Complete the table for oil. [1]

(ii) Suggest **three** reasons why Uzbekistan has been slower to invest in renewable energy sources than some other countries.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(iii) The government of Uzbekistan plans to increase its generation of electricity from renewable sources by 2026. This will reduce the country's emission of carbon dioxide gas.

Explain why reducing emissions of carbon dioxide gas is important.

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..... [3]

(b) The table shows the percentage electricity consumption for different economic sectors in Uzbekistan.

economic sector	percentage electricity consumption
industry	40
domestic	23
agriculture	20
services	.....
transport	3
construction	1

(i) Complete the table for the services sector. [1]

(ii) Describe strategies to reduce electricity consumption in the domestic sector.

.....

.....

.....

.....

.....

..... [3]

(iii) Suggest reasons why the amount of electricity consumed by the transport sector differs between a less economically developed country (LEDC) and a more economically developed country (MEDC).

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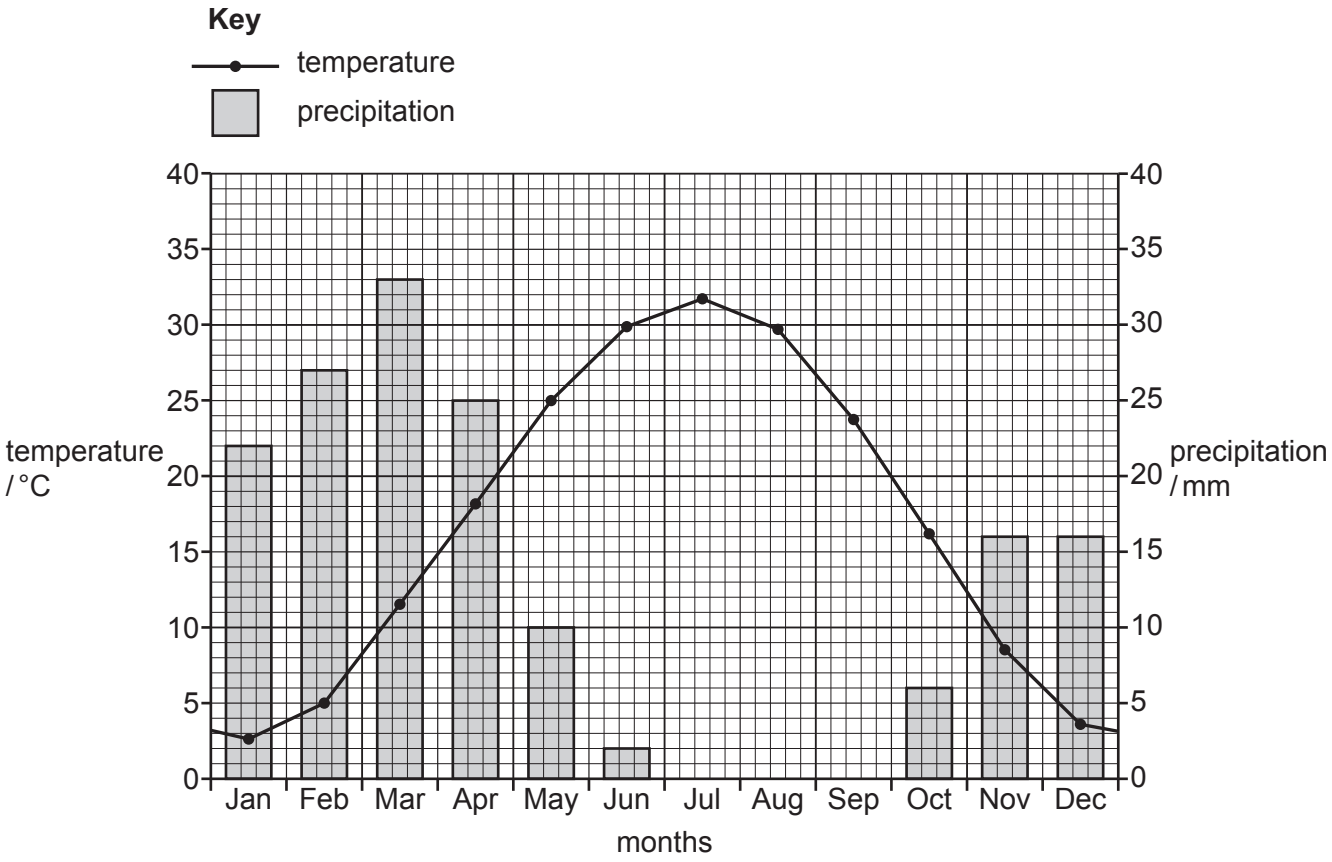
..... [2]

[Total: 13]

4 The graph shows the mean temperature and precipitation at a weather station in Uzbekistan over a ten-year period.



(a) (i) Calculate the temperature range at this weather station.

.....°C [1]

(ii) State the months of the year with the lowest precipitation.

..... [1]

(iii) Explain why low rainfall can increase the risk of soil erosion.

.....

.....

.....

..... [2]

(b) (i) The table shows some components of soil.
Complete the table.

component of soil	example
mineral particles	
mineral ions	
organic matter	

[3]

(ii) Describe ways the addition of organic matter improves the fertility of a soil.

.....

.....

.....

..... [2]

(iii) Soil contains air. Carbon dioxide is a gas in air.

State **two** processes in the carbon cycle that release carbon dioxide.

1 .....

2 .....
[2]

(iv) State **two** other gases in clean air.

..... and ..... [1]

(v) State **two** ways the concentration of atmospheric carbon dioxide can be reduced.

.....

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..... [2]

(c) Explain why it is important for ecosystems to be managed sustainably.

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..... [3]

[Total: 17]

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