Pearson Edexcel

GCSE (9-1) Geography A

Resource Management

Exam questions

Booklet 1

Name:

Questions

Q1.
Study the figure below.

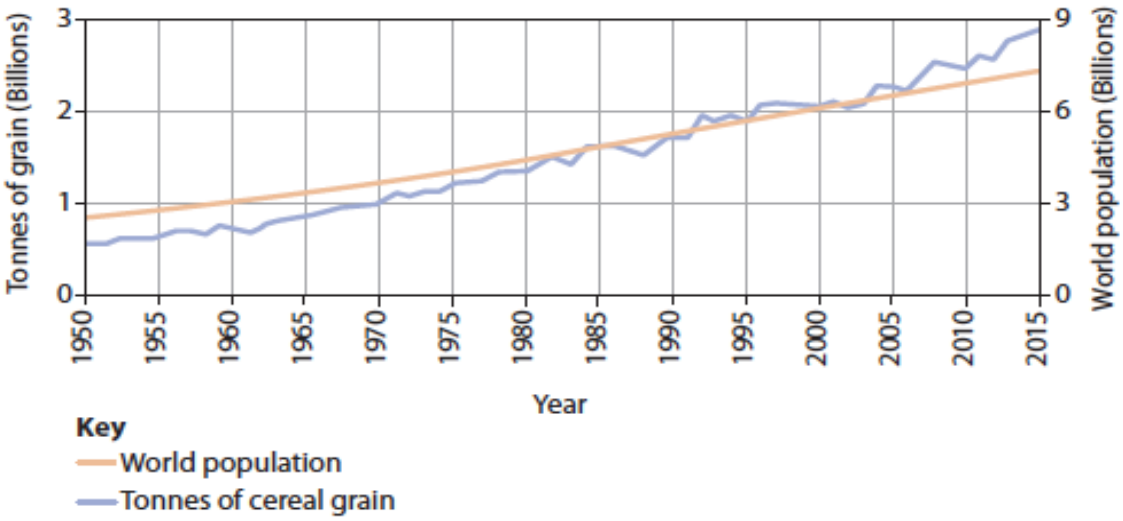


Figure 3

World production of cereal grain and world population, 1950-2015

(i) Compare the trends shown in Figure 3.

(2)

(ii) Suggest **two** negative impacts on the environment of the trend in cereal grain production.

(4)

(iii) One type of information that could be used to investigate the impact of farming on the environment is a website.
Describe **one** technique that could be used to process this information.

(2)

(Total for question = 8 marks)

Q2.

People exploit and can change environments in order to obtain natural resources.

(i) Define the term **abiotic**.

(1)

.....

.....

(ii) Identify **one** abiotic resource.

(1)

- ☒ **A** animals
- ☒ **B** birds
- ☒ **C** plants
- ☒ **D** oxygen

(Total for question = 2 marks)

Q3.

People exploit and can change environments in order to obtain natural resources.

Define the term **renewable resource**.

(1)

Q4.

Study the figure below.

Year	Amount of forest cover in Tanzania (%)
1990	63
1995	61
2000	59
2005	57
2010	55
2015	53

Figure 3

Changes in the amount of forest cover in Tanzania, 1990–2015

(i) Identify the amount of forest cover in 2020 if the trend shown on Figure 3 continues.

(1)

- ☒ **A** 51%
- ☒ **B** 53%
- ☒ **C** 55%
- ☒ **D** 57%

(ii) Calculate the mean amount of forest cover shown on Figure 3.

Answer to one decimal place.

You must show your workings in the space below.

(2)

(iii) Name **one** type of graph that could be used to present the data shown on Figure 3.

(1)

(iv) State **one** possible reason for the trend shown on Figure 3.

(1)

(v) Explain **two** ways in which the trend shown on Figure 3 could impact on the environment.

(4)

(Total for question = 9 marks)

Q5.

The distribution and demand for natural resources varies around the world.

Fish are a biotic resource. Name **two** other biotic resources.

(2)

Q6.

People exploit and can change environments in order to obtain non-renewable energy resources such as oil.

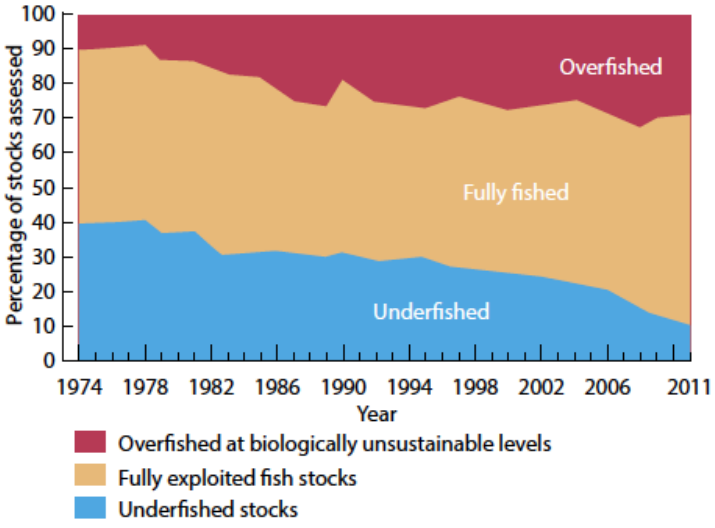
Oil is a non-renewable resource. Name **two** other non-renewable resources.

(2)

Q7.

The distribution and demand for natural resources varies around the world.

Study the figure below.



(Source: Extract from 'http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/')

Figure 3

Global trends in the state of marine fish stocks, 1974–2011 (FAO, 2014)

(i) Identify the percentage of stock that was overfished in 2011.

(1)

- ☒ **A** 28%
- ☒ **B** 58%
- ☒ **C** 78%
- ☒ **D** 98%

(ii) Calculate the difference between the percentage of total stock underfished between 1974 and 2011.

(1)

(iii) Suggest **one** reason for the trend in the percentage of stocks underfished shown in Figure 3.

(2)

(iv) Suggest **two** ways the trends shown in Figure 3 would impact on this environment.

(4)

(Total for question = 8 marks)

Q8.

People exploit and can change environments in order to obtain non-renewable energy resources such as oil.

Study the figures below.

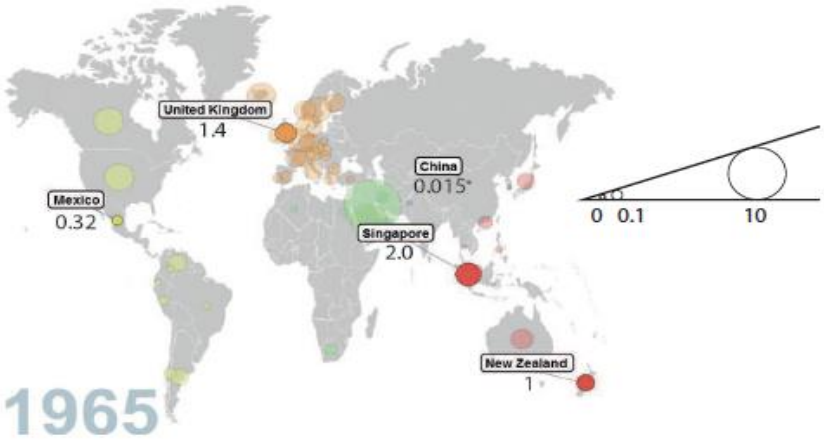


Figure 3a

Oil consumption (tonnes per person) in 1965

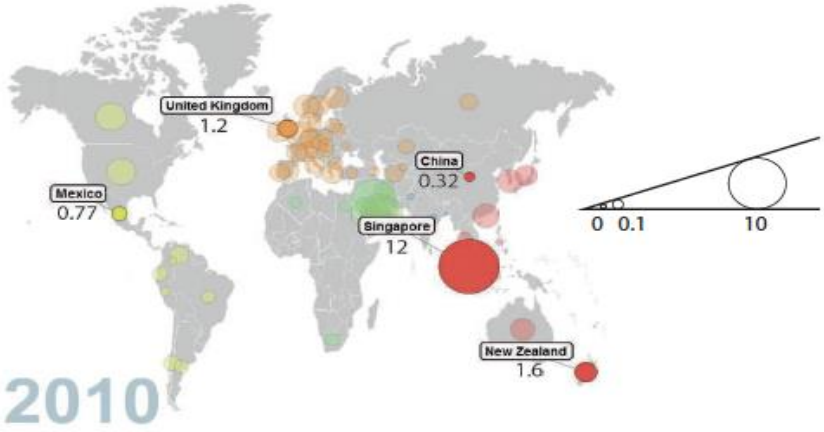


Figure 3b

Oil consumption (tonnes per person) in 2010

(i) Identify the country which had a decrease in oil consumption between 1965 and 2010.

(1)

- ☒ **A** China
- ☒ **B** New Zealand
- ☒ **C** Mexico
- ☒ **D** UK

(ii) Calculate the percentage increase in Singapore's oil consumption per person between 1965 and 2010.

(1)

(iii) Suggest **one** reason for the global trend in oil consumption shown in Figures 3a and 3b.

(2)

(iv) Suggest **two** ways how the trend shown in Figures 3a and 3b would impact on the environment.

(4)

(Total for question = 8 marks)

Mark Schemes

Q1.

Question number	Answer	Mark
(i)	Award 1 mark for each comparative statement, up to a maximum of 2 marks: World production of grain and world population have both increased (1) World population has had a greater (relative) increase (1) Production of grain has fluctuated more than world population (1) World population has been more of a steady/constant increase (1). Allow up to one mark for supporting data (1) e.g. population has changed from 2.8 to 7.5 billion (1) / grain has changed from 0.6 to 2.9 (1) **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
(ii)	Award 1 mark for identifying an impact, and a further 1 mark for further explanation of this impact or its cause, up to a maximum of 2 marks each. Greenhouse gases are released into the atmosphere (1) reducing air quality / increasing problems of global warming / due to the use of (farm) machinery (1) Soil exposed more often to the weather (1) which increases soil erosion / due to over-farming / over-ploughing of the land (1) Habitat loss (1) reducing biodiversity / due to deforestation or increased monoculture (1) Eutrophication / reduction in water quality (1) killing animals / due to the use of chemical fertiliser (1) Increase in non-biodegradable / plastic waste (1) due to packaging of final product (1) **Accept any other appropriate response**	**(4)**

Question number	Answer	Mark
(iii)	Award 1 mark for suitable technique, and a further mark for description of what this technique might show, up to a maximum of 2 marks: Use of 'wordle' – *or similar* (1) to analyse the text of the website about farming impacts (1) Use of a spreadsheet / Excel (1) to display data about farming impacts over time (1) Use of PowerPoint / Publisher (1) to transform the information about farming impacts into a poster (1) Create a table (1) to show the positive and negative impacts of farming (1) Drawing a graph (1) to show data from the website e.g. impacts of farming over time (1) **Accept any other appropriate response**	**(2)**

Q2.

Question number	Answer	Mark
(i)	Non-living things / not derived from organic matter **Accept any other appropriate response**	(1)

Question number	Answer	Mark
(ii)	**D** oxygen Incorrect responses: **A**, **B** and **C** are all examples of biotic resources.	(1)

Q3.

Question number	Answer	Mark
	Can be used again/never run-out/naturally replenished **Accept any other appropriate response.** **Do not accept:** It can be recycled	(1)

Q4.

Question number	Answer	Mark
(i)	**A 51%** Incorrect responses: The trend in Figure 3 clearly shows a decrease of 2% every year. **B** 53%: this is the *same* percentage as 2015 **C** 55%: this is an *increase* of 2% **D** 57%: this is an *increase* of 4%	(1)

Question number	Answer	Mark
(ii)	Working to show: Addition of the six percentages for each year, and the division of his by six (1) The correct calculation, arriving at a mean of 58.0% (1). Maximum of 1 mark if no working out is shown. **Accept any other appropriate workings**	(2)

Question number	Answer	Mark
(iii)	Award 1 mark for any of the following: Line graph (1). Histogram (1). Pictogram (1) Bar graph/chart (1)	(1)

Question number	Answer	Mark
(iv)	Award 1 mark for any of the following: Deforestation (1) Increased demand for farmland/cattle ranching/palm (vegetable) oil (1) Increased demand for timber/fuelwood (1) Clear land for mineral extraction/mining/housing (1) To encourage landless people to set up small farms (1). Growth of illegal logging being allowed (1). Trend might be due to a growing population / urbanisation in Tanzania (1). To build more roads (1). **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
(v)	Award 1 mark for suggesting one impact, and a further 1 mark for further explanation / application of knowledge and understanding, up to a maximum of 2 marks each. Reduced the size of wildlife habitats (1) which means that species numbers / biodiversity may fall (1). Producers are killed / there are fewer producers in the food chain to feed off (1) which means that some species may become extinct (1 There is a reduction in the amount of decaying leaves on the forest floor (1) which means that there is a reduced soil fertility (1). Increased flooding (1) because run-off increases (1). Increased soil erosion (1) because there is less protection for the soil from heavy rainfall (1). Increased global warming (1) because there are fewer trees to remove the carbon dioxide from the atmosphere (1). Increased risk of drought (1) because fewer trees will lead to a reduction in transpiration (1). **Accept any other appropriate response.**	**(4)**

Q5.

Question number	Answer	Mark
	Award 1 mark for each of the following, up to a maximum of 2 marks: humans (1) worms (1) dogs (1) cattle (1). **Accept any other appropriate response**	**(2)**

Q6.

Question number	Answer	Mark
	Award 1 mark for each of the following, up to a maximum of 2 marks: Coal (1) (Natural) gas (1) Nuclear/uranium (1) Biomass (1) Wood (1) **Accept any other appropriate response**	**(2)**

Q7.

Question number	Answer	Mark
(i)	A	**(1)**

Question number	Answer	Mark
(ii)	Accept between 31% and 27%	**(1)**

Question number	Answer	Mark
(iii)	Award 1 mark for suggesting one reason, and a further 1 mark for an appropriate extension, up to a maximum 2 marks: increase in overfishing creates stock reduction for the future (1), which leads to an unsustainable stock level for future generations (1) more overfishing leads to a decline in the percentage of stocks that are underfished (1) because of a reduction in juvenile fish (1) increase in marine pollution/impact of global warming on the oceans (1), leading to a general decline in the health of fish stocks (1). **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
(iv)	Award 1 mark for a basic environmental impact of overfishing and a further 1 mark for extension through description or explanation, up to a maximum of 4 marks: fewer fish left in the sea/ocean (1) use of data from Figure 3 to support (1) reducing the amount of fish that predators eat (1), therefore having knock-on effects further up the food chain (1). increases the species further down the food chain that the fish would have consumed (1) a decline in fish stocks in one area (1) could lead to other un-tapped parts of the ocean might becoming exploited (1). **Accept any other appropriate response.**	**(4)**

Q8.

Question number	Answer	Mark
(i)	D	(1)

Question number	Answer	Mark
(ii)	500%	(1)

Question number	Answer	Mark
(iii)	Award 1 mark for suggesting one reason, and a further 1 mark for an appropriate extension, up to a maximum 2 marks. Some countries are experiencing industrialisation (1) which means that businesses/factories require significant amounts of oil in order to operate (1). Increasing wealth in some countries (1) which leads to the demand for cars which require oil for fuel (1). The process of globalisation (1) means that people travel more often, using oil to fuel airplanes/cars (1). Growing concerns over energy security (1) means that more oil reserves are explored/exploited as other resources are depleted (1).	(2)
	In some emerging countries (such as China) there has been a growth in manufacturing (1) which means oil consumption has gone up to meet the demand for energy supply, change from .015 to 0.32 per person (1) (mirror image of decreasing use in developed countries such as the UK where oil consumption has fallen from 1.4 to 1.2 as a result of changes in government policies, economic change and environmental policy). **Accept any other appropriate response**	

Question number	Answer	Mark
(iv)	Award 1 mark for an impact on the environment of increased oil exploitation and a further 1 mark for a development of this point, up to a maximum of 4 marks. Wildlife migration routes/habitats are disrupted (1) by the noise and pollution from vehicles/drilling for oil (1). Marine ecosystems/sea birds are disrupted (1) when oil accidentally spills into the sea/onto the land during its extraction (1). Deforestation to make way for oil extraction activities (1) could increase rates of soil erosion/flooding (1). Increased light pollution at night time (1) because of the machinery/gas flares that are part of the oil industry (1). **Accept any other appropriate response**	(4)

Pearson Edexcel

GCSE (9-1) Geography A

Resource Management (Water)

Exam questions

Booklet 2

Name:

Questions

Q1.
Study the figure below.

Figure 5

Water usage on a potato farm in the UK, a developed country

(i) Identify the type of water usage shown in Figure 5.

(1)

- ☒ **A** desalination
- ☒ **B** infiltration
- ☒ **C** channelisation
- ☒ **D** irrigation

(ii) The photograph in Figure 5 provides some information about water usage in a developed country.

State **two** additional pieces of information that would help to investigate the differences in water usage between developed, and emerging or developing countries.

(2)

(iii) Suggest **one** reason why this type of water usage is common in the area shown in Figure 5.

(4)

(Total for question = 7 marks)

Q2.

The development, production and consumption of different water resources needs to be managed carefully.

* Assess the importance of annual rainfall for the water supply of countries at different levels of development.

(8)

Q3.

In this question, up to four additional marks will be awarded for your spelling, punctuation, grammar and use of specialist terminology.

Areas around the world have challenges in managing their water resources.

Assess the reasons why there are differences in water consumption between a developed country and **either** an emerging **or** a developing country.

(8)

Q4.

The development, production and consumption of different energy resources needs to be managed carefully.

* Assess the impacts on people of developing non-renewable and renewable energy resources.

(8)

Q5.

Assess the views held by organisations and governments on the management of water resources.

(8)

Q6.

Some countries suffer from a water deficit.

Define the term **water deficit**.

(1)

Q7.

Evaluate different approaches used by **either** a named developing **or** emerging country to manage and use water resources in a sustainable way.

(8)

Q8.

Areas around the world have challenges in managing their water resources.

Explain **one** way a named developed country has attempted to manage its water resources in a sustainable way.

(4)

Q9.

Explain **one** reason why the development of water resources can have positive impacts.

(4)

Q10.

Areas around the world have challenges in managing their water resources.

Explain **one** disadvantage of desalination.

(2)

Q11.

Explain **one** reason why there is a difference in domestic water usage between different countries.

(3)

Q12.

The development, production and consumption of different water resources needs to be managed carefully.

Explain **one** reason why water availability has decreased in the last 50 years.

(2)

Q13.

Explain **one** reason why some parts of the world have a water deficit.

(2)

Q14.

The development, production and consumption of different water resources needs to be managed carefully.

Explain why water resources need to be managed.

(4)

Q15.

Areas around the world have challenges in managing their water resources.

Identify the meaning of the term **water surplus**.

(1)

- ☒ **A** the supply of useable water is greater than its demand
- ☒ **B** the amount of rainfall is lower than the amount of evaporation
- ☒ **C** the water quality has declined due to pollution from industry
- ☒ **D** the supply of useable water is lower than the demand

Q16.

The development, production and consumption of different water resources needs to be managed carefully.

Identify the percentage of the Earth's water that is fresh water.

(1)

- ☒ **A** 3%
- ☒ **B** 40%
- ☒ **C** 60%
- ☒ **D** 97%

Q17.

The development, production and consumption of different water resources needs to be managed carefully.

Identify the percentage of water on the Earth that is available as fresh water.

(1)

- ☒ **A** 0.2%
- ☒ **B** 3%
- ☒ **C** 25%
- ☒ **D** 60%

Q18.

Study the figure below.

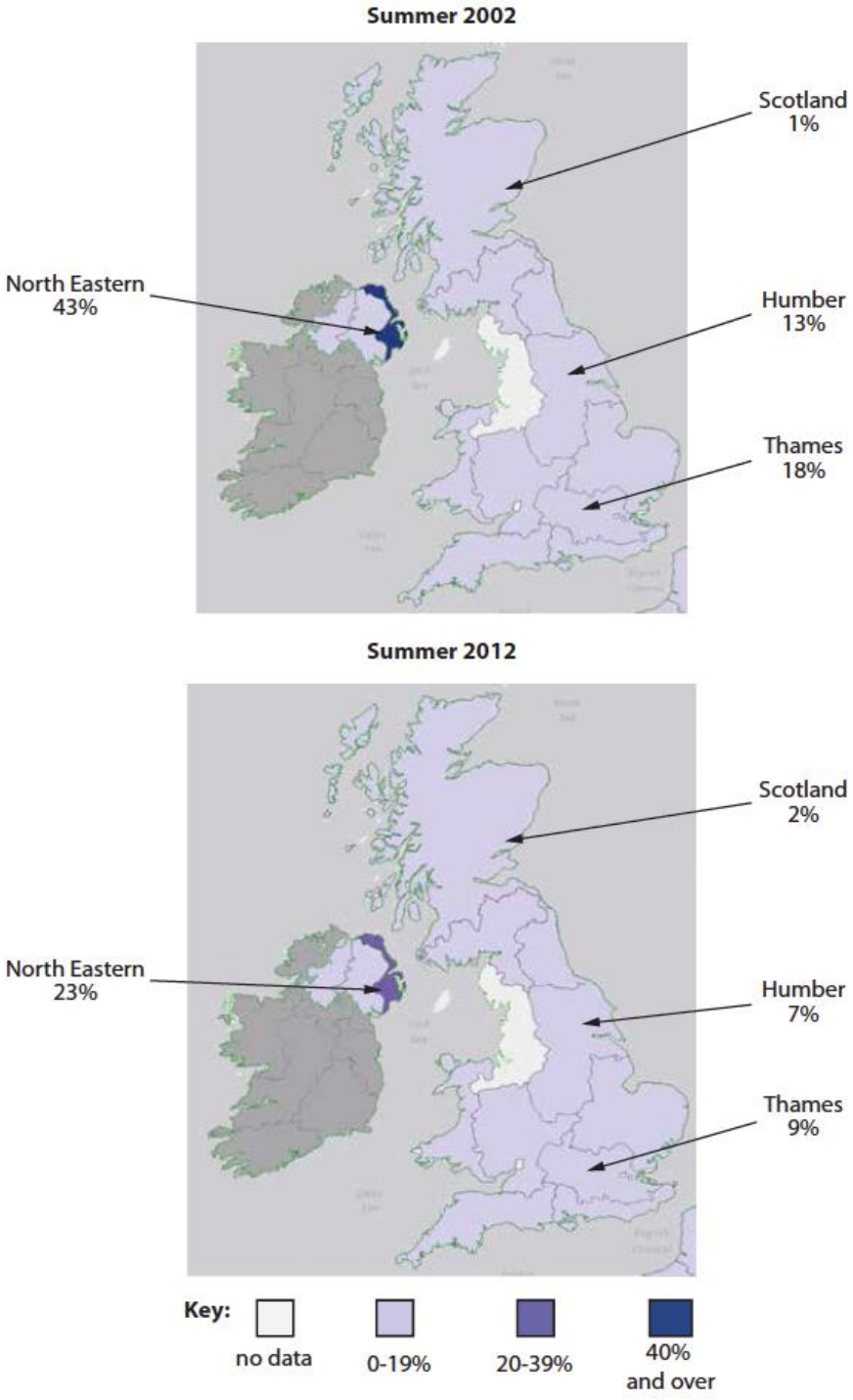


Figure 5

Water Exploitation Index (WEI) for selected areas in the UK

Areas around the world have challenges in managing their water resources.

Water stress can be measured using the Water Exploitation Index (WEI).

Identify the decrease in the Humber area's WEI.

(1)

- ☒ **A** 2%
- ☒ **B** 4%
- ☒ **C** 6%
- ☒ **D** 8%

(ii) Identify the area with the smallest change in WEI between summer 2002 and summer 2012.

(1)

(iii) State **two** possible reasons for the change in the North Eastern area's WEI shown on **Figure 5**.

(2)

Q19.

Areas around the world have challenges in managing their water resources.

State **one** reason why some areas have water supply problems.

(1)

Q20.

The increasing global consumption of water resources requires careful management.

Identify what is removed from water by desalination.

(1)

- ☒ **A** acid
- ☒ **B** mercury
- ☒ **C** salt
- ☒ **D** methane

Q21.

The development, production and consumption of different water resources needs to be managed carefully.

Study the figure below.

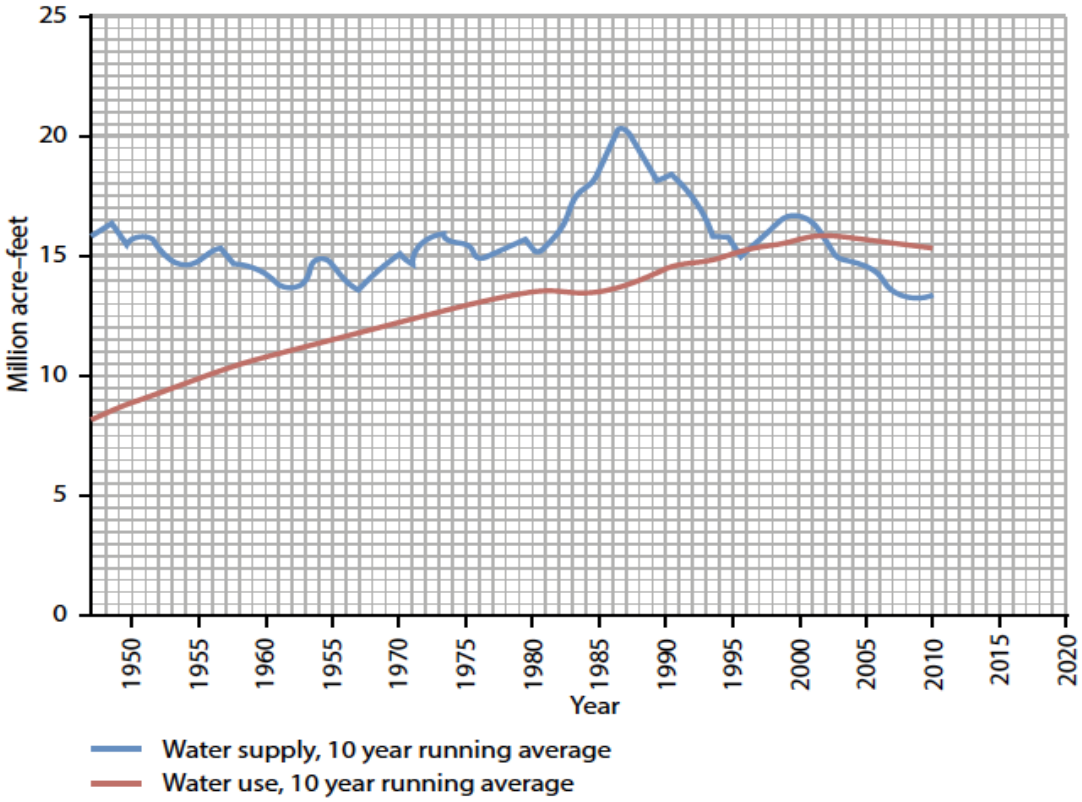


Figure 5

Water supply and water use in the Colorado River Basin, 1950–2010

(i) Calculate the increase in water use between 1950 and 2010.

(1)

(ii) Calculate water use as a percentage of water supply in 1986.

(1)

(iii) Identify the total water use in 2020 if the trend shown on Figure 5 continued.

(1)

- ☒ **A** 11.5
- ☒ **B** 13
- ☒ **C** 14.5
- ☒ **D** 18

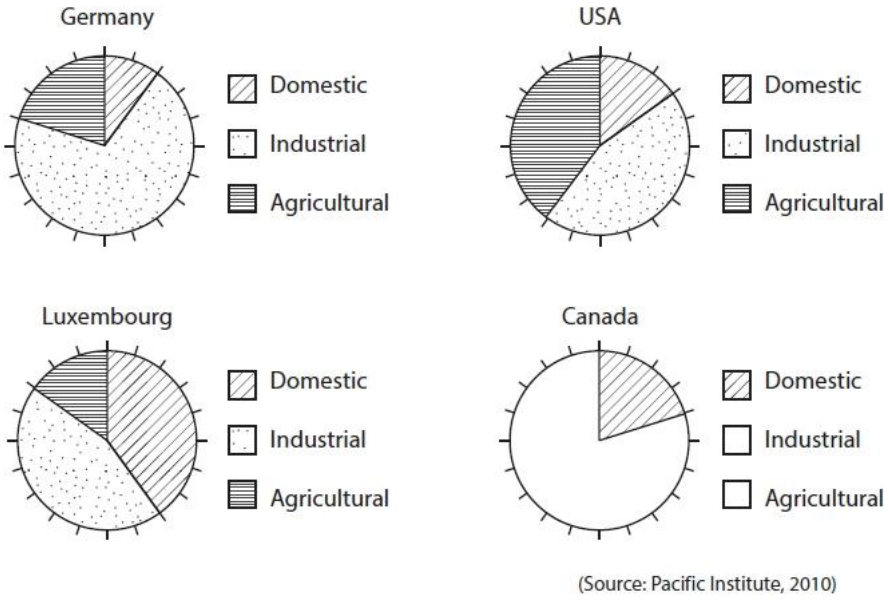
(iv) Suggest **one** reason for the changes in water supply between 1950 and 2010 on Figure 5.

(2)

Q22.

The increasing global consumption of water resources requires careful management.

Study Figure 5 below.



(Source: Pacific Institute, 2010)

Figure 5

Total consumption of freshwater by sector in selected developed countries, 2010

(i) Plot the data for Canada given in the table below by completing the pie chart on Figure 5.

(2)

Country	Sector	
	Industrial	Agricultural
Canada	70%	10%

(ii) Identify which country's agricultural sector consumes the most freshwater.

(1)

- ☒ **A** Germany
- ☒ **B** USA
- ☒ **C** Luxembourg
- ☒ **D** Canada

(iii) State **two** reasons why the agricultural sector's freshwater consumption varies in Figure 5.

(2)

(Total for question = 5 marks)

Mark Schemes

Q1.

Question number	Answer	Mark
(i)	**D** irrigation Incorrect responses: **A**, **B** and **C** are incorrect because these are not shown on Figure 5.	**(1)**

Question number	Answer	Mark
(ii)	Award 1 mark for each additional piece of information, up to a maximum of 2 marks. Data/spreadsheet/graph about how much water is used (in different sectors) (1) Data/spreadsheet/graph about population (1) Information about income (1) Data/spreadsheet/graph about how accessibility to water supplies (1) Economic data (e.g. GDP per capita / HDI score) (1) Interviews with local people about their water usage habits (1) Climate/rainfall data (1) Information about water storage/transfer schemes (1) Proximity of water supply in relation to settlements / houses (1) Government policy/investment into water supply schemes (1) Ownership of water sources (1) **Accept any other appropriate response**	**(2)**

Question number	Answer	Mark
(iii)	Award 1 mark for a reason why irrigation is used in the UK / the area shown in Figure 5, and a further one mark for explanation, up to a maximum of 4 marks. Rainfall in some parts of the UK is low (1) which means that in some areas, there is not enough rainfall for the crops (1) which means that irrigation is needed to water the land (1) otherwise the crops will not grow (1). Rainfall is unbalanced / varies seasonally in the UK (1) with most of the rain falling during winter (1) which means that irrigation is needed to overcome shortages in summer (1) which means that water wastage will be minimised (1). The UK is a developed country which can afford irrigation technology (1) which increases crop yield (1) as the growing season is prolonged (1) which means that the demand by the growing population is met (1). This type of water usage is needed to help plants/crops grow (1) as the rainfall might be quite low (1) which means that irrigation allows enough crops to be grown to meet the needs of the population / maximise profits for the farmer (1) and reduce the need to import food supplies (1). This type of water usage an effective way of watering a large area of land (1) as it is less labour intensive than watering it manually (1) which means that it can be done more quickly (1) which will maximise crop yield (1) **Accept any other appropriate response**	**(4)**

Q2.

Question number	Indicative content
*	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • Water supply is not just about the availability of clean drinking water in a country; water supply also covers water quality and provision for uses other than domestic supply. • There are a number of different factors that can influence that water supply in a country, e.g. annual rainfall, infrastructure of storing and moving water (including sewage and water pipes) and human intervention (e.g. dams/reservoirs and geopolitical agreements). • Annual rainfall varies globally – which has a direct impact on the amount of water available in a country for domestic, agricultural and industrial usage. • In many parts of the world, annual rainfall is not even throughout the year. This presents countries with the challenge of storing water when it is not required and moving water supplies from areas of high rainfall to areas of high demand. • The management and sustainable use of water is essential to ensure a regular and consistent water supply; the way in which this is done varies between countries at different levels of development.
	AO3 • Water supply needs to be managed to meet demand – and there are different types of demand within a country, e.g. for agriculture, industry and domestic uses. • The ability to successfully manage the water supply sustainably within a country may be just as, or even more, important than the annual levels of rainfall in the first place. For example, mismanagement of water supplies could actually lead to water-quality problems and therefore reduce the availability of supply for domestic use. • More-developed countries often have a greater capacity to manage their water resources (e.g. through large top-down projects such as dams and reservoirs) which reduce the reliance on a regular, high annual rainfall. Also, more-developed countries often have the technology and infrastructure to overcome distribution problems; if one area of the country receives a low annual supply then water can be transported from an area with a high supply and lower demand. • Sustainable management is required to reduce water supply problems in the future – and this can vary between countries, depending on various political, social, economic and environmental factors.

Q3.

Question number	Indicative content
*	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • Water consumption can be defined as the amount of water used by a person, group of people or country. • The main categories of water consumption are agriculture, industry and domestic usage. • Countries at different levels of development tend to have different patterns of water consumption. • In developing/emerging countries, the largest sector for water consumption is usually agriculture (e.g. for irrigation), whereas the smallest sector is for domestic use (e.g. cooking and drinking). • In developed countries, agriculture is often the largest sector, but with a smaller proportion compared with developing/emerging countries; therefore, the proportions for industrial and domestic consumption are often much higher compared to developing/emerging countries. **AO3** • A very large proportion of water consumption in developing/emerging and developed countries is for agricultural purposes; however much of this water is not used efficiently due to a lack of technology/resources. In developed countries, water for agriculture is used more efficiently with less wastage due to the greater availability of sprinklers/irrigation systems. • A small proportion of water is used for industrial purposes in developing/emerging countries because there a fewer large factories compared to developed countries – although this is changing as a result of globalisation/FDI/the growth of TNCs. In developed countries, a greater proportion of water is used in industry as these countries have a greater number of large-scale factories that require water as part of the manufacturing process. • The proportion of water consumption for domestic purposes in developing/emerging countries is low as infrastructure (e.g. water pipes and sewage management) is much less developed compared to developed countries – where issues of cost and affordability are also important. In developed countries, a higher standard of living/greater wealth per person raises the demand for domestic water for drinking/washing/cleaning/leisure purposes. • The patterns of water consumption are not fixed: as countries experience changes in their levels of development (due to factors such as globalisation, population change and political decisions) – so does the proportions by which sectors use water resources.

Q4.

Question number	Indicative content
*	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • Renewable energy sources are those energy sources whose flow is continuous and will never run out, whereas non-renewable energy resources (e.g. fossil fuels – oil, coal and natural gas) will eventually run out. • The development of non-renewable energy resources can have **negative** impacts on people, e.g. coal mining can be dangerous and damaging to health as workers may have to endure cramped conditions deep below the surface. • The development of non-renewable energy resources can have **positive** impacts on people such as providing employment opportunities. • The development of renewable energy resources can have **negative** impacts on people, e.g. through the development of windfarms, which some people believe spoil the scenery or disrupt TV/radio/mobile phone signals. • The development of renewable energy resources can have **positive** impacts on people such as it agrees with their ethics/viewpoints about reducing the effects of global warming. The development of renewable energy resources (e.g. solar, wind, tidal) that do not emit greenhouse gases – which is ultimately healthier for people as no air pollution is created.
	AO3 • Impacts are often inter-related, with one impact often leading to another, potentially more serious, impact. The burning of non-renewable energy resources (e.g. coal, oil) can lead to air pollution, which can then lead to respiratory problems and an increase in the cases of asthma in a particular region. • People are often aware of the negatives of developing non-renewable resources but accept these as the potential outcomes (i.e. jobs/money) are perceived to be worth the risk. • Different groups of people can be affected differently within a country, e.g. in some parts of the world, owners of TNCs will benefit from non-renewable resources as their development is relatively cheap and the technology is readily available. However, other people in the same country may suffer as a result of the environmental impacts and on an international scale there might be wider impacts such as global warming or the increasing cost of these resources for consumers. • The impacts of non-renewable and renewable energy resources can vary significantly depending on the type of resource, the nature of the country wanting to develop it and the way it is being (sustainably) managed. For example, laws about planning permission, carbon emissions and waste disposal can all have indirect positive or negative impacts on people.

Q5.

Question number	Indicative content
	AO2 (4 marks)/AO3 (4 marks) **AO2** • The world's population is growing, which is going to increase the demand for water resources. • If demands for water are to be met in the future, water resources are going to require sustainable management. • Sustainable management is where water resources are used in a way that ensures that environmental degradation does not occur and the needs of future generations are met. • Broader implications linked to pollution and waste management need to be considered. • Countries are also looking to secure water supplies for geopoloitical reasons as well as meeting the needs of their population. • Future issues linked to climate change need to be considered as this could place further pressure on water supplies. • More sustainable uses of water resources are slowly being developed, but these are often costly and people are often reluctant to change their habits. • Different groups of people have different views on the management and sustainable use of water resources; these views are often complex, contradictory and vary according a country's level of development.
	AO3 • Some organisations will have the view that they need to water their crops regardless issues to sustainability; this is because reduced water usage might lead to a reduction in crop yield, which will have a negative financial impact on the farmer. • A country's government will have contrasting priorities; they will want to ensure that there is enough water to supply the population, but they will also need to ensure that supplies in a way that there will be enough in the future. • Conservation groups will want to ensure that levels of water quality are high and wildlife habitats are not damaged by new developments; this may conflict with water companies and governments wanting to develop water supplies to meet the needs of growing demand. • Some organisations/governments in developed countries may be reluctant to conserve water as they can afford to pay for it; they may have other views e.g. developments for leisure / water sports are equally as important as developments for drinking water. • Water companies are trying to balance supply and demand, but this is difficult given the ageing infrastructure (including leaking pipes) in some areas which could lead to inefficient distribution of water around the country. They might have the view that the government should be spending more money on upgrading old pipes, but the government's priorities may lie elsewhere. • Some governments in emerging/developing country may recognize the importance of developing clean water supplies for a healthier working population which could lead to economic development; however, they might not have the capacity to implement any new developments or have to rely on aid and international support from NGOs such as Water Aid.

Q6.

Question number	Answer	Mark
	Award 1 mark for any one of the following: Water demand is greater than /exceeds supply (1) A place that has less water than required (1) **Must have idea of supply and/or demand; do not credit 'water shortage' or 'lack of water' unless linked to supply or demand.** **Accept any other appropriate response**	**(1)**

Q7.

Question number	Indicative content
*	**AO2 (4 marks)/AO3 (4 marks)** **AO2** • There are problems in supplying water in developing/emerging countries including the lack of availability of clean water, diseases spread via the water supply and water pollution. • Growing populations, particularly in urban areas, mean that the number of people who do not have access to safe water is growing. • Sixty million children are born each year in developing/emerging countries who do not have access to safe water – this is a major barrier to further development. • Top-down and bottom-up strategies have been used to manage water resources in developing/emerging countries, with the aim of improving water supply and reducing water pollution. Both strategies have their advantages and weaknesses, but many believe that bottom-up approaches that use appropriate/intermediate technology is usually the best way to manage supply. • Examples of intermediate technology included the collection of clean drinking water from a manmade well - but the supply can be unreliable and sometimes the well itself can be a source of disease. • Gravity-fed schemes are used where there is a spring on a hillside. The water can be piped from the spring down to the villages. • Boreholes can require more equipment to dig, but can be dug quickly and usually safely. They require a hand or diesel pump to bring the water to the surface. • In addition to locating new sources of water, some strategies help to reduce the need for water. These include harvesting (collecting) rainwater landing on buildings, recycling waste water to use on crops, improving irrigation techniques, growing crops less dependent on a high water supply and minimising evaporation of water.

	AO3 Evaluation will depend on the specific case studies, but may include: • As cities in developing/emerging countries grow, so does the demand for water. The problem doesn't end when water supplies have been improved and pipes put in place. The water has got to come from somewhere, and the source of supply may be scarce. • Without safe water people cannot lead healthy and productive lives. Areas which are in poverty are likely to remain in that way. • One example where non-governmental charities have helped break this cycle is in Nigeria. In Nigeria only 38 per cent of people have access to sanitation. A community led total sanitation project (CLTS) was started by one non-governmental charity. In one year, the project helped 2.5 million people gain access to sanitation. Areas with poor infrastructure, high rates of illness and poverty were identified, and the charity worked with the local population in these areas. The teams worked with the people and educated them as to how poor hygiene and sanitation can make people ill. This included how it can also make others in the community ill. Toilets were built using local, affordable materials. Key people in the community led the work. • Jakarta in Indonesia has a rapidly growing population and water companies do not have the resources to supply reliable and safe water to everyone. In addition, salt water is also contaminating groundwater, which is making the problem worse. This is a particular problem in shantytowns such as Marunda. • Like most shantytowns, Marunda lacks basic services such as water supply, sanitation and electricity. People there have a poor standard of living and a low quality of life. Conditions are crowded and disease spreads easily, contributing to low life expectancy and high infant mortality rates.

Q8.

Question number	Answer	Mark
	Award 1 mark for the identification of a national/regional strategy to manage water resources in a sustainable way, plus a further 2 marks for extension through explanation and 1 mark for exemplification, up to a maximum of 4 marks. National/local governments develop specific policies about water usage (1) which means that water companies must act responsibly (1) by regulating the amount of water that is taken from rivers to meet demand (1) supporting detail of same (1). Governments may impose specific regulations on housing developments (1) which means that planners/builders may have to build more water-efficient homes (1) for example by installing dual-flush toilets in all new-builds (1) supporting detail of same (1). Schemes are being developed to involve more people in the management of river catchment areas (1) which will mean that all stakeholders will have a say in how the water resource is used (1) and control extraction in a sustainable way (1) supporting detail of same (1). Homeowners and industries are being made aware about why it is important to conserve water (1) for example through the installation of water meters (1) which reduces the bills for those people who use less water than others (1) which means that they might be encouraged to use the shower more, rather than the bath (1) **Accept any other appropriate response.**	**(4)**

Q9.

Question number	Answer	Mark
	Award 1 mark for a positive impact and a further 1 mark for explanation of its effect, up to a maximum of 4 marks. The development of water resources may lead to clean drinking water becoming more widely available (1), which will improve the health of the population (1), because illnesses will be reduced (1) which will increase the prosperity/economy of the area (1). Water supply can be regulated to reduce flooding (1) and ensure a steady supply for farmers (1) which would increase productivity in the area (1) which could facilitate reinvestment into further water management (1). **Accept any other appropriate response**	**(4)**

Q10.

Question number	Answer	Mark
	Award 1 mark for identification of a disadvantage and a further 1 mark for an extension of this idea, up to a maximum of 2 marks. Desalination is not a very efficient process/only a small proportion of useable water is created (1) which means that this is unlikely to be a large-scale solution (1). Large quantities of salt water are created as a waste product (1) which may disrupt the balance of marine ecosystems when disposed of into the sea (1). Desalination plants require frequent maintenance to prevent a build-up of bacteria (1) which is expensive/time-consuming (1). Fish/marine creatures can get trapped /killed (1) which will reduce biodiversity (1). A large of quantity of energy resources is needed to power desalination plants (1) which may result in carbon emissions/greenhouse effect (1). Desalination plants have very high set-up / running costs (1) which means that they are not a viable option in every country (1). Limiting locational factors e.g. land-locked (1) which means that they are not a viable option in every country (1). **Accept any other appropriate response.**	**(2)**

Q11.

Question number	Answer	Mark
	Award 1 mark for a reason why there is a difference, and a further 1 mark for explanation of why this has an effect on domestic water usage, up to a maximum of 3 marks. Little government investment into infrastructure (1) which means that households have limited access to piped water to households (1) as there are limited funds available to develop the infrastructure (1). Different countries have different levels of development (1) which means that people in developed countries can afford to use more water (1) so they tend to have more baths / showers / swimming pool / kitchen appliances that use water (1). In some countries, there are restrictions on how much water can be used each day (1) because rainfall levels are low each year / seasonal variation (1) which means that people have to use water much more sparingly (1). It is much easier to access clean drinking water some countries (1) because the government has invested more in infrastructure (1) which may lead to some people using (and wasting) more as it is easily replaced (1) There is a smaller supply of water to start with (1) due to low rainfall / pollution of water courses by industry (1) which means that restrictions on domestic usage are in place (1). **Accept any other appropriate response**	**(3)**

Q12.

Question number	Answer	Mark
	Award 1 mark for point about water consumption and a further one mark for explanation of reason for the change, up to a maximum of 2 marks: changes in levels of rainfall (1) such as periods of drought or above average rainfall (1) over-abstraction of ground water (1), leading to lower levels of discharge into the river basin (1) climate change (1) leading to long term decline in precipitation/river flow since 1987 (1) **Accept any other appropriate response**	**(2)**

Q13.

Question number	Answer	Mark
	Award 1 mark for a reason for a water deficit and a further 1 mark for further extension, up to a maximum of 2 marks. The population in some parts of the world is growing rapidly (1) which means demand for water is higher than supply (1). Some parts of the world have low rainfall/arid climates (1) which means that the supply of water is lower than demand (1). Some parts of the world do not have the technology or funds to transfer water (1) which means that water collected in areas of high rainfall cannot reach the areas of high population (1). Water has been used in an unsustainable way in industry (1) so that groundwater stores have not had chance to have been replenished (1). **Accept any other appropriate response**	**(2)**

Q14.

Question number	Answer	Mark
	Award 1 mark for point about water resource and a further one mark for explanation of reason for management, up to a maximum of 4 marks: to ensure/increases the availability of (clean) drinking water (1), which will improve the health of the population (1) to reduce flooding (1), allowing for the necessary infrastructure for industry to be established (1) to increase opportunities for leisure and recreation (1), which could bring jobs to an areas (1) to prevent water supply becoming polluted (1), which has a negative impact on the health of the local population (1) water resources are finite (1) but the global population/demand is growing (1). **Accept any other appropriate response**	**(4)**

Q15.

Question number	Answer	Mark
	A the supply of useable water is greater than its demand Incorrect responses: **B, C and D** do not refer to water supply being greater than demand	**(1)**

Q16.

Question number	Answer	Mark
	A	**(1)**

Q17.

Question number	Answer	Mark
	B 3% Incorrect responses: **A, C** and **D** are incorrect because these are not the correct percentage of water on the Earth that is available as fresh water.	**(1)**

Q18.

Question number	Answer	Mark
(i)	**C** 6% **A** 2% = incorrect subtraction of 7% from 13% **B** 4% = incorrect subtraction of 7% from 13% **D** 8% = incorrect subtraction of 7% from 13%	(1)

Question number	Answer	Mark
(ii)	Scotland	(1)

Question number	Answer	Mark
(iii)	Award 1 mark for any of the following, up to a maximum of 2 marks. Higher rainfall in 2012 than in 2002 (1) New water supplies have been found (1) Development of technology /desalination plants (1) Infrastructure/pipes have now been repaired/maintained (1) Demand for water resources has fallen (1) Less wastage through leaking pipes (1) More (waste) water treatment / recycling plants (1) New laws introduced to conserve water supplies (1)/ **Accept any other appropriate response.**	(2)

Q19.

Question number	Answer	Mark
	Award 1 mark for any of the following: Lack of rainfall (1) ageing infrastructure (1) leaking pipes (1) seasonal imbalances of rainfall (1) some areas have experienced a population increase / marked increase in demand (1) poverty (1) prone to drought (1) **Accept any other appropriate response.** **Do not accept** Reasons for water quality problems	(1)

Q20.

Question number	Answer	Mark
	C	(1)

Q21.

Question number	Answer	Mark
(i)	7.5 million acre-feet	(1)

Question number	Answer	Mark
(ii)	65.8% Accept between 60% and 70%	(1)

Question number	Answer	Mark
(iii)	C	(1)

Question number	Answer	Mark
(iv)	Award 1 mark for suggesting one reason, and a further 1 mark for an appropriate extension, up to a maximum 2 marks: between 1950 and 1980, the area received a similar amount of rainfall (1) so the water supply did not change very much during that period (1) the Government might have been trying to conserve water since 1988 (1) which has led to a fall in water supply (1) water transport systems / pipes may be leaking and in need of repair (1), which is why water supply has been falling in the last 20 years (1) increased amount of rainfall / wetter seasons (1) increased the water supply during the early-mid 1980s (1). **Accept any other appropriate response**	(2)

Q22.

Question number	Answer	Mark
(i)	1 mark for a correctly drawn line to create two sectors (1). 1 mark for correctly shading both sectors (1).	(2)

Question number	Answer	Mark
(ii)	B	(1)

Question number	Answer	Mark
(iii)	Award 1 mark for each statement stating one reason, up to a maximum 2 marks. USA may have more areas of farmland (1). USA larger area of farmland that may require irrigation (1). Some countries may already have high levels of rainfall (1). Some countries require less water for irrigation purposes (1). USA may have more arable land whereas the other countries might have more pastoral farming (1). **Accept any other appropriate response**	(2)