

Surname	Centre Number	Candidate Number
First name(s)		0



GCSE

C112U20-1



TUESDAY, 17 NOVEMBER 2020 – MORNING

GEOGRAPHY B – Component 2
Problem Solving Geography

1 hour 30 minutes

For Examiner's use only		
	Maximum Mark	Mark Awarded
Part A	35	
Part B	25	
Part C	12	
SPaG	4	
Total	76	

ADDITIONAL MATERIALS

Resource Folder.

In addition to this paper you may use a calculator and a ruler if required.

INSTRUCTIONS TO CANDIDATES

Answer **all** of the questions in this examination.

Use black ink or black ball-point pen. Do not use gel pen. Do not use correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Write your answers in the spaces provided in this booklet.

Additional space is provided for some questions within the booklet (if required). If further space is required for any question, you should use the lined page(s) at the end of this booklet. The question number(s) should be clearly shown.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part-question.

You are reminded that assessment will take into account your ability to spell, punctuate and use grammar and specialist terminology accurately in your answer to Part C.



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Growing cities in High Income Countries (HICs) need to plan for the future to ensure that they have a sustainable water supply. This is proving to be a challenge.

Some cities experience a Mediterranean type climate (warm wet winters, hot dry summers). Summer is usually a time when demand for water is greater than the supply. In recent years climate change has created even greater challenges. Average temperatures have increased, whilst rainfall amounts have become unreliable.

Part A: provides information about the causes and effects of water shortages in the Mediterranean climate zone. 35 marks

Part B: provides information about four strategies (ways) that cities have used to reduce the threat of water shortages. 25 marks

Part C: asks you to choose **two** of the strategies that you think **would work well together**, to help the city of Valencia (Spain) avoid water shortages in the future. 16 marks

Part A – The causes and effects of water shortages in cities in the Mediterranean climate zone.

You are advised to spend about 35 minutes on this part.

(a) Study **Figure 1** on **page 2** of the Resource Folder.

Identify **two** features that all four locations have in common. Use map evidence only. [2]

1:

2:

(b) Study **Figures 2** and **3** on **page 3** of the Resource Folder.

(i) San Diego (**Figure 2**) records its lowest rainfall figure and its highest temperature in August.

Identify the month that this pattern occurs in Perth (**Figure 3**). [1]

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(ii) Explain why latitude has an impact on temperature. [2]

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- (iii) Calculate **the range** of temperature for San Diego. Show your working in the space below

[2]

The range of temperature for San Diego is: °C

- (c) The Mediterranean climate, in San Diego, creates a number of challenges for people and the environment. Use **Figure 2**.

- (i) Suggest **one** challenge for people.

[3]

One challenge for people would be:

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- (ii) Suggest **one** challenge for the environment.

[3]

One challenge for the environment would be:

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- (d) The table below shows information about the population of three of the cities shown on **Figure 1**.

All three cities have experienced rapid growth in the last 40 years.

City	Population (in millions)		
	1979	2019	% increase in 40 years
San Diego	1.5	1.9	26.67%
Perth	1.6	2.1	31.25%
Valencia	1.4	1.7	

- (i) Calculate the percentage (%) increase for Valencia from 1979 to 2019. Show your working. [2]

Show your working here:

The percentage (%) increase for Valencia was %

- (ii) A geography student decides to represent the 1979 and 2019 population data for each city as proportional circles.

Suggest **one** advantage and **one** disadvantage of using this graphical technique. [2]

Advantage:

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Disadvantage:

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(e) Much of the growth of the three cities can be explained by migration.

(i) Describe what effects migration has had on a city in a HIC. [4]

The HIC city I studied was:

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(ii) Explain **one** push factor that causes people to migrate to cities in HICs. [2]

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- (f) With increasing populations, growing cities face a number of issues related to water shortages.

In the table below, identify if the issue is environmental, economic or social by writing **EN** or **EC** or **SO** in the second column. [6]

EN – environmental

EC – economic

SO – social

Issues related to water shortages	EN or EC or SO
If we abstract (take) too much water from underground stores (aquifers), surface rivers can dry up and ecosystems suffer.	
The cost of providing fresh water can be very high, so water bills for industry are constantly rising, which means lower profits for companies.	
Neighbourhood arguments break out when some households ignore appeals to save water and continue to water their gardens and wash their cars.	
Some farmers have abandoned the idea of growing highly profitable crops that need lots of water. These farmers earn less money.	
The look of the city is changing. There is less greenery. Grassed areas and borders planted with flowers are being removed in an attempt to save water.	
Turning sea water into fresh water (desalination) can damage coastal ecosystems reducing biodiversity.	



- (g) In recent years the water authorities in cities like San Diego and Perth have warned people that the situation is serious.



When water demand exceeds supply we can't continue to ignore the problem. It's just not sustainable.

The situation has been made worse in recent years as droughts have become more frequent.

The comment refers to **sustainability** and **drought**. Tick (✓) the **two** boxes that best gives an accurate meaning for each term. [2]

Sustainable means using a resource:	Tick (✓) the correct box
when it is needed, without worrying about the future.	
carefully, so that the cost remains low for all to afford.	
wisely, so that it is not depleted or permanently damaged.	

Drought means:	Tick (✓) the correct box
a time when people use up all of the available water.	
a period of short, heavy rainfall.	
a prolonged period when expected rains do not fall.	



(h) Transferring water between countries can be used to solve water shortages.

Describe **two** challenges of managing water in this way.

[4]

Challenge 1

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Challenge 2

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End of Part A



Part B – Four strategies (ways) that cities have used to reduce the threat of water shortages.

You are advised to spend about 35 minutes on this part.

In this part you will be introduced to four strategies that cities like San Diego and Perth have used to manage their water supplies more effectively. Each strategy has positive and negative features.

Strategy 1 – Using underground water stores (aquifers).

(a) Study the information on **page 4** of the Resource Folder.

(i) Explain why climate influences stores and flows of water. [4]

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(ii) If the wells used by farmers dry up, their profits will fall. Suggest **one** reason why. [2]

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Strategy 2 – Building desalination plants.

(b) Study the information on **page 5** of the Resource Folder.

Desalination plants remove salt from the water. They burn large amounts of fossil fuels.

(i) Explain why environmentalists are against the use of fossil fuels. [3]

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(ii) Desalination plants are rarely found in LICs (low income countries) and NICs (newly industrialised countries). They may seek help from MNCs (multi-national companies) to develop such infrastructure.

Give **one** reason to explain why these countries might need investment from MNCs. [3]

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Strategy 3 – Persuading people to use less water.

(c) Study the information on **page 6** of the Resource Folder.

The table below shows how people living in different cities feel about three strategies used to overcome water shortages.

The percentage (%) of people who believe that			
Cities	Using groundwater is the best option	Using desalination is the best option	Passing strict new laws is the best option
Perth	50% %	10%
San Diego	45%	45%	10%
Cape Town	85%	10%	5%

(i) Complete the table by adding the % figure for desalination use in Perth. [1]

(ii) What conclusions can you reach from the data provided in the table? [2]

1st conclusion:

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2nd conclusion:

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(iii) Suggest **one** reason why the introduction of strict new laws can be an unpopular way to reduce water use. [2]

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Strategy 4 – Stopping the future growth of ‘thirsty’ industries.

(d) Study the information on **page 7** of the Resource Folder.

Growing crops, such as almonds and avocados, and mining for rocks, such as bauxite, require a huge quantity of water. These processes have a large water footprint.

(i) What is a water footprint? [2]

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(ii) When MNCs are prevented from expanding in an area, they are likely to move to other locations.

Explain why **social** problems can occur in areas that lose major employers. [4]

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(e) The city of **Valencia** in Spain is facing a difficult decision about its **water supply**. The city has many of the same challenges as San Diego and Perth.

- the population is increasing
- the Mediterranean climate has natural periods when water supply is short
- the city has a growing tourist industry

With climate change the warm temperatures often last well into the autumn and the low rainfall figures make it a more attractive destination for tourists.

The problem is the city is already facing some water shortages.

I'm not sure what decisions will be reached about how we deal with this.



Suggest why the tourist industry has a large water footprint.

[2]

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End of Part B



Part C – How should the city of Valencia reduce the threat of water shortages in the future?

You are advised to spend about 20 minutes on this part.

Which **two** strategies would work well together to help the city of Valencia reduce the threat of water shortages in the future?

Justify why you think these two strategies would work well together **and** why you rejected other combinations. [12]



Use the information in this examination paper and the Resource Folder. Your ability to spell, punctuate and use grammar and specialist terminology accurately will be assessed in your answer. [4]

You may use the space above to help organise your ideas. Your report should start on the next page.



Additional space for **Part C** only:

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End of Part C
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