edexcel

INTERNATIONAL GCSE

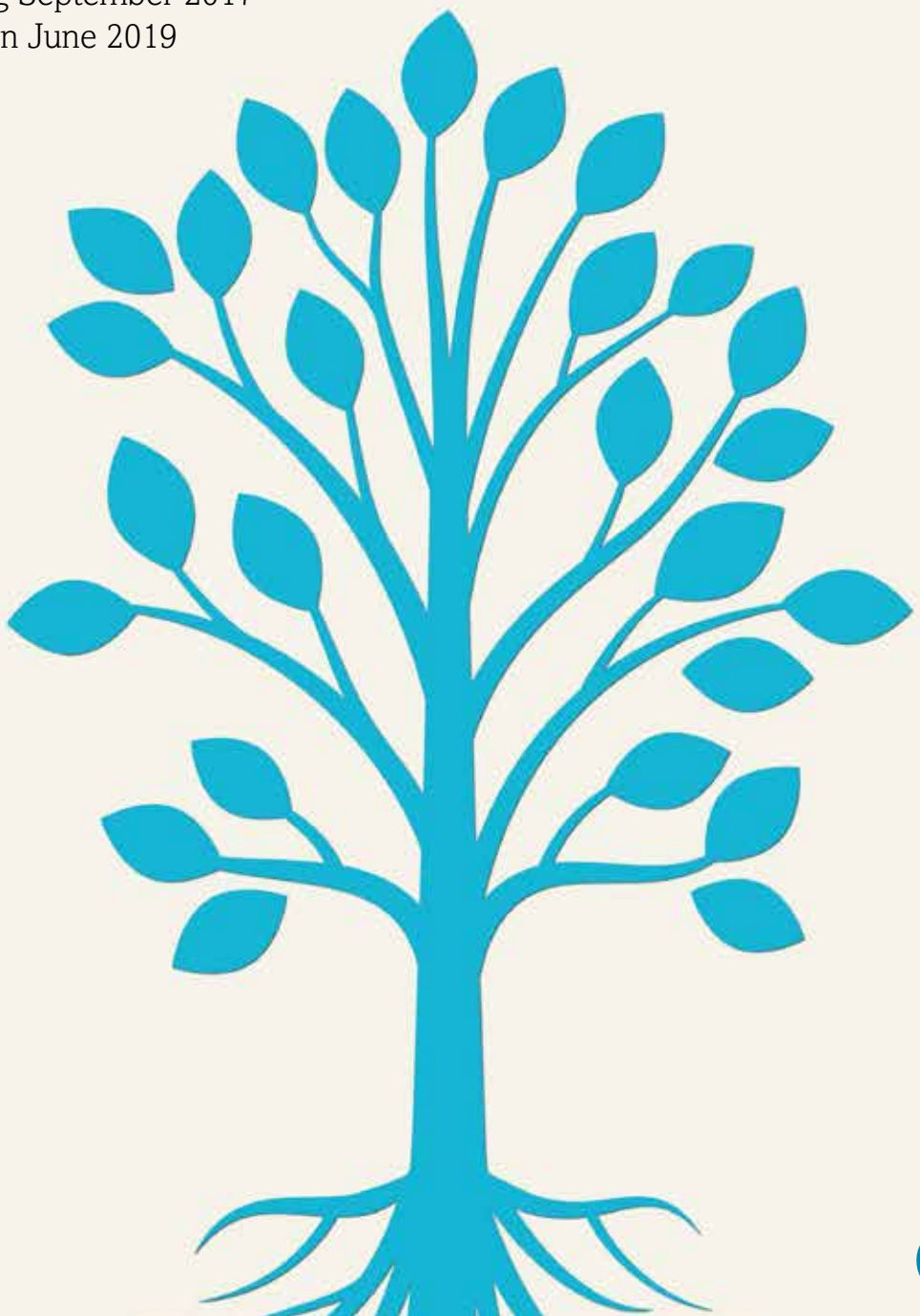
Geography (9-1)

SAMPLE ASSESSMENT MATERIALS

Pearson Edexcel International GCSE in Geography (4GE1)

For first teaching September 2017
First examination June 2019

Issue 2



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These sample assessment materials are Issue 2. Key changes are sidelined. We will inform centres of any changes to this issue. The latest issue can be found on our website qualifications.pearson.com

Acknowledgements

These sample assessment materials have been produced by Pearson on the basis of consultation with teachers, examiners, consultants and other interested parties. Pearson would like to thank all those who contributed their time and expertise to this development.

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All information in these sample assessment materials is correct at time of going to publication.

ISBN 978 1 4469 4934 4

Contents

Summary of Pearson Edexcel International GCSE in Geography (4GE1) sample assessment materials Issue 2 changes

Summary of changes made between previous issue and this current issue	Page number
Question Paper 1 – amended question 3(c)(i) and (ii)	16
Question Paper 1 – amended question 3(d)	17
Resource Booklet for Paper 1 – amended figure 3a	39
Mark Scheme for Paper 1 – amended answers for question 3(c)(i) and (ii)	56
Mark Scheme for Paper 1 – amended answers for question 3(d)	57

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.ht

Introduction

The Pearson Edexcel International GCSE (9-1) in Geography is designed for use in schools and colleges. It is part of a suite of International GCSE qualifications offered by Pearson.

These sample assessment materials have been developed to support this qualification and will be used as the benchmark to develop the assessment students will take.

General marking guidance

- All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark scheme – not according to their perception of where the grade boundaries may lie.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification/indicative content will not be exhaustive. However different examples of responses will be provided at standardisation.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, a senior examiner must be consulted before a mark is given.
- Crossed-out work should be marked **unless** the candidate has replaced it with an alternative response.

Marking guidance for levels based mark schemes

How to award marks

The indicative content provides examples of how students will meet each skill assessed in the question. The levels descriptors and indicative content reflect the relative weighting of each skill within each mark band.

Finding the right level

The first stage is to decide which level the answer should be placed in. To do this, use a 'best-fit' approach, deciding which level most closely describes the quality of the answer. Answers can display characteristics from more than one level, and where this happens markers must use the guidance below and their professional judgement to decide which level is most appropriate.

Placing a mark within a level

After a level has been decided on, the next stage is to decide on the mark within the level. The instructions below tell you how to reward responses within a level. However, where a level has specific guidance about how to place an answer within a level, always follow that guidance. Statements relating to the treatment of students who do not fully meet the requirements of the question are also shown in the indicative content section of each levels based mark scheme. These statements should be considered alongside the levels descriptors.

Markers should be prepared to use the full range of marks available in a level and not restrict marks to the middle. Markers should start at the middle of the level (or the upper-middle mark if there is an even number of marks) and then move the mark up or down to find the best mark. To do this, they should take into account how far the answer meets the requirements of the level:

- If it meets the requirements fully, markers should be prepared to award full marks within the level. The top mark in the level is used for answers that are as good as can realistically be expected within that level
- If it only barely meets the requirements of the level, markers should consider awarding marks at the bottom of the level. The bottom mark in the level is used for answers that are the weakest that can be expected within that level
- The middle marks of the level are used for answers that have a reasonable match to the descriptor. This might represent a balance between some characteristics of the level that are fully met and others that are only barely met.

Write your name here

Surname	Other names

Pearson Edexcel International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Geography

Level 1/2
Paper 1: Physical geography

Sample assessment material for first teaching September 2017

Time: 1 hour 10 minutes

Paper Reference **4GE1/01**

You must have:
Resource Booklet, calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- In Section A, answer **two** questions from Questions 1, 2 and 3.
- In Section B, answer **one** question from Questions 4, 5 and 6.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Calculators may be used.
- **You must show all your working out with your answer clearly identified at the end of your solution**.

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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S 5 4 7 4 6 A 0 1 2 8

Pearson

SECTION A

Answer TWO questions from this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If you answer Question 1 put a cross in the box ☐ .

1 River environments

(a) Identify the meaning of the term 'groundwater flow'.

(1)

☐	**A** Movement of water over the Earth's surface
☐	**B** Movement of water within the soil
☐	**C** Movement of water through the rocks below the soil
☐	**D** Movement of water through plants and trees

(b) (i) Identify **one** process of river erosion.

(1)

☐	**A** Suspension
☐	**B** Abrasion
☐	**C** Channelisation
☐	**D** Traction

(ii) State **one** physical factor affecting the rate of river erosion.

(1)

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.....

(iii) Explain **one** type of physical weathering in river valleys.

(2)

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(c) Study Figure 1a in the Resource Booklet.

Suggest **two** factors that have led to the river regime shown on Figure 1a.

(4)

1 .....

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2 .....

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(d) Explain **one** way that human activity has reduced water quality.

(3)

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(e) Study Figure 1b below.

(Source: © Terry Smith Images/Alamy Stock Photo)

Figure 1b

A river landscape in Arkansas, USA

Identify landform X shown in Figure 1b.

(1)

.....

(f) Explain the formation of a waterfall.

(4)

(g) Study Figures 1c and 1d in the Resource Booklet.

Analyse the differences in the hydrographs for rivers P, Q and R.

(8)

(Total for Question 1 = 25 marks)

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If you answer Question 2 put a cross in the box ☐ .

2 Coastal environments

(a) Identify **one** type of soft engineering used to manage coastal landscapes.

(1)

☒	**A** Groynes
☒	**B** Beach nourishment
☒	**C** Revetments
☒	**D** Riprap

(b) (i) Identify **one** process of marine erosion.

(1)

☒	**A** Hydraulic action
☒	**B** Saltation
☒	**C** Acid rain
☒	**D** Freeze-thaw

(ii) State **one** type of mass movement that affects coastal landscapes.

(1)

.....

.....

(iii) Explain **one** type of biological weathering on cliffs.

(2)

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(c) Study Figure 2a in the Resource Booklet.

Suggest **two** factors that have led to the differences in coastal retreat shown in Figure 2a.

(4)

1 .....

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2 .....

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(d) Explain **one** cause of coastal flooding.

(3)

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(e) Study Figure 2b below.

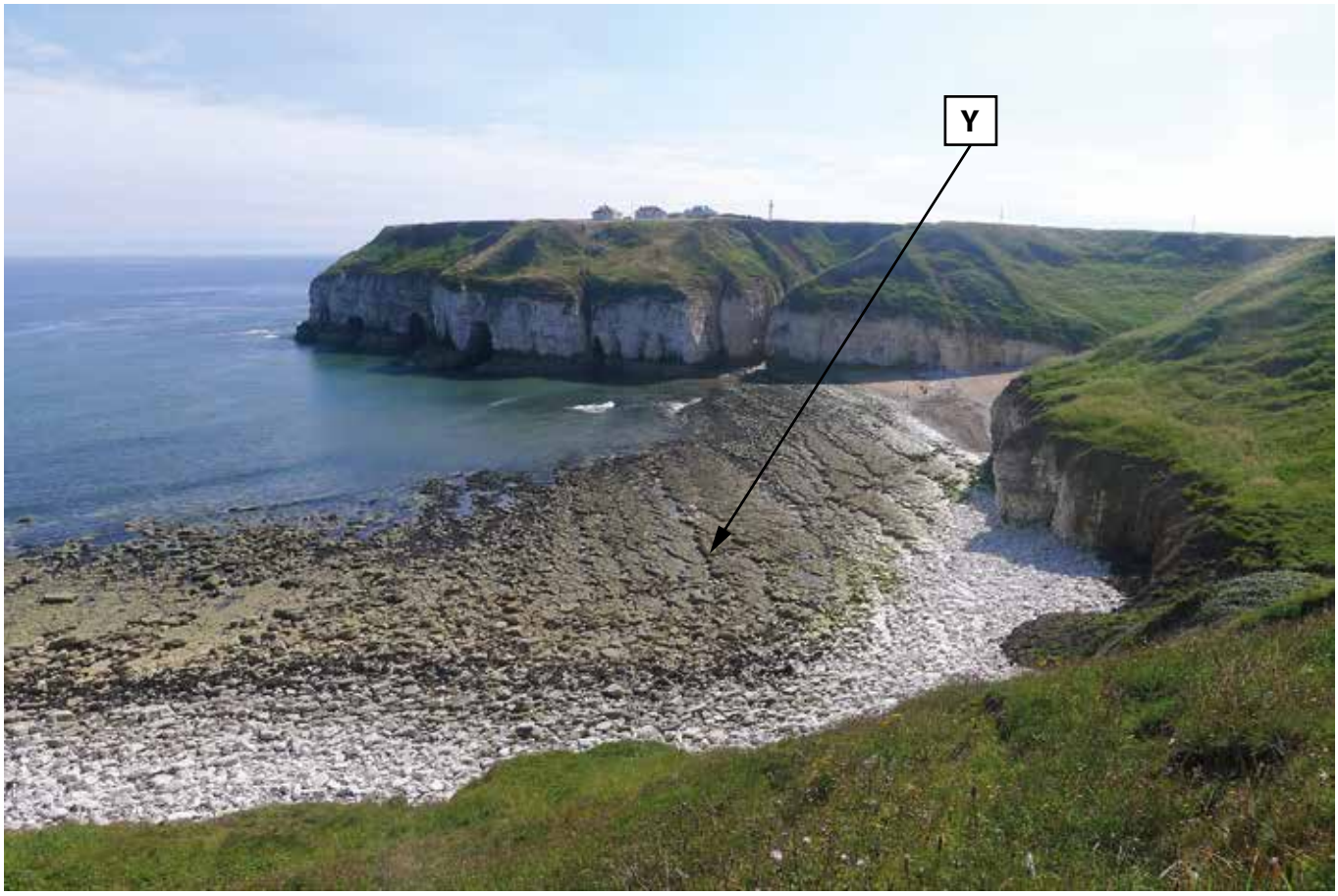

Figure 2b

A coastal landscape in East Yorkshire, England

Identify landform Y shown in Figure 2b.

(1)

.....

(f) Explain the formation of a spit.

(4)

(g) Study Figures 2c, 2d and 2e in the Resource Booklet.

Analyse the threats to small- and large-scale coastal ecosystems from people and their activities.

(8)

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DO NOT WRITE IN THIS AREA

(Total for Question 2 = 25 marks)

If you answer Question 3 put a cross in the box ☐ .

3 Hazardous environments

(a) Identify **one** type of tectonic hazard.

(1)

☒	**A** Hurricane
☒	**B** Drought
☒	**C** Flooding
☒	**D** Earthquake

(b) Identify **one** characteristic of a hotspot.

(1)

☒	**A** Volcanoes are constantly erupting
☒	**B** There is a plume of magma below the surface
☒	**C** Tectonic plates are moving past each other
☒	**D** Many fold mountains are found there

(c) (i) State **one** way people could prepare for an earthquake in a **developed** country.

(1)

.....

.....

(ii) Explain **one** way short-term relief helps to reduce earthquake impacts in a **developing** country.

(2)

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(d) Study Figure 3a in the Resource Booklet.

Suggest **two** reasons for the differences in the numbers of people affected by earthquake disasters shown in Figure 3a.

(4)

1 .....

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2 .....

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(e) Explain **one** impact of a volcanic eruption.

(3)

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(f) Study Figure 3b below.

Figure 3b

An area of volcanic activity in Antigua

Identify **one** advantage of living near the volcano shown in Figure 3b.

(1)

.....

(g) Explain the formation of a volcano at a destructive plate margin.

(4)

(h) Study Figure 3c in the Resource Booklet.

Analyse the differences between these three earthquakes.

(8)

(Total for Question 3 = 25 marks)

TOTAL FOR SECTION A = 50 MARKS

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SECTION B

Geographical enquiry

Answer ONE question only from this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If you answer Question 4 put a cross in the box ☐ .

4 Investigating river environments

Study Figure 4a in the Resource Booklet. It shows the data collected for an investigation about changes in a river channel.

(a) (i) Identify the correct unit for velocity in Figure 4a.

(1)

☒	**A** m^2
☒	**B** m/s
☒	**C** m^3
☒	**D** m

(ii) Calculate the mean width of the river shown in Figure 4a.

Give your answer to one decimal place.

You must show all your workings in the space below.

(2)

..... m

Using the data in Figure 4a:

(iii) plot the points for Site 4 and Site 7 on Figure 4b.

(2)

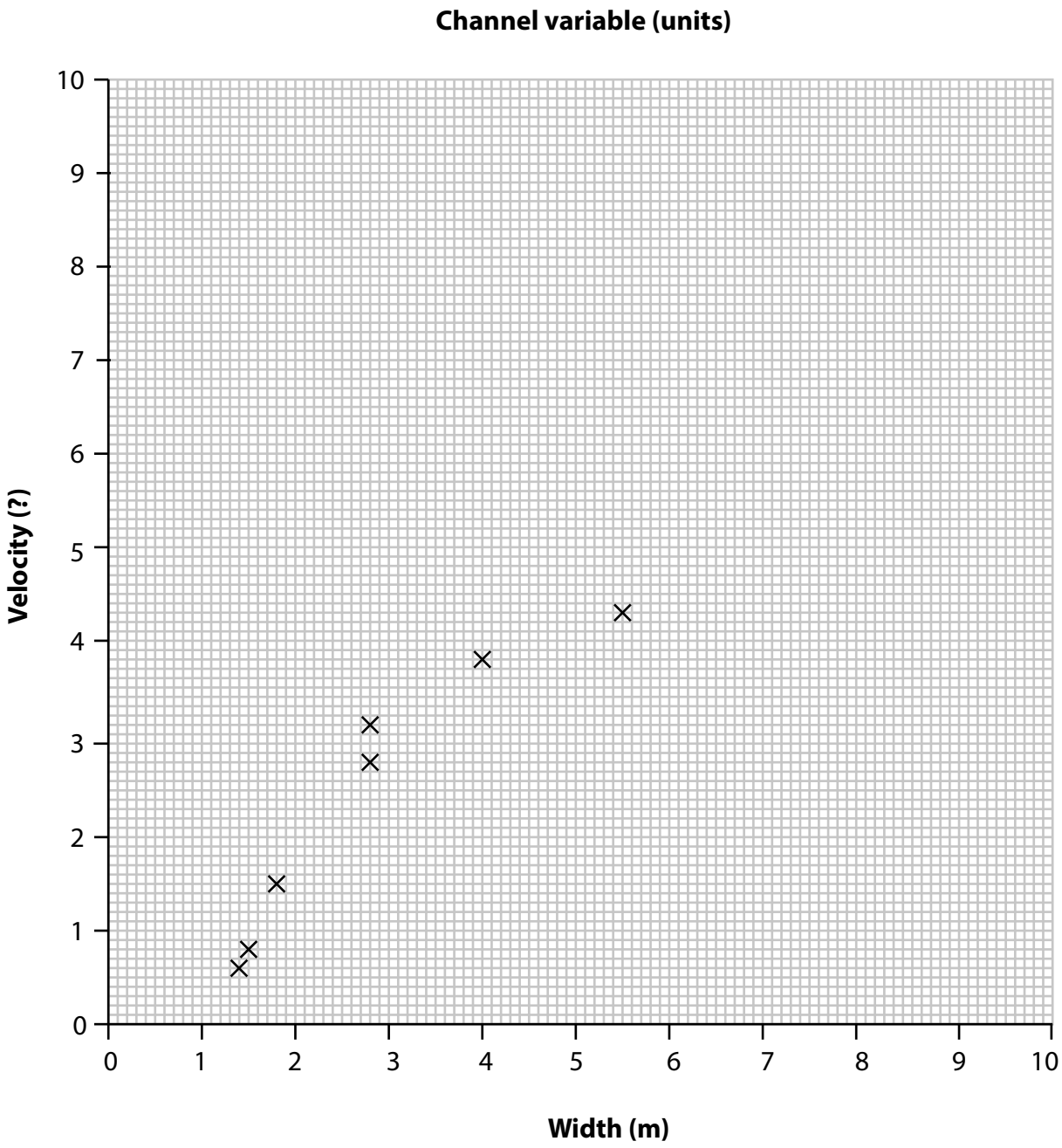

Figure 4b

(iv) draw a line of best fit on Figure 4b.

(1)

(v) explain **one** reason for the relationship shown on Figure 4b.

(2)

(b) Study Figure 4c in the Resource Booklet. It shows information about the sampling strategy used in the collection of river data.

Explain **one** advantage and **one** disadvantage of using this sampling strategy.

(4)

Chosen sampling strategy

Advantage

Disadvantage

You have studied a river channel as part of your own geographical enquiry.

(c) Evaluate the accuracy of your conclusions.

(8)

Enquiry question

(Total for Question 4 = 20 marks)

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If you answer Question 5 put a cross in the box ☐ .

5 Investigating coastal environments

Study Figure 5a in the Resource Booklet. It shows the data collected for an investigation about changes along a coastline.

(a) (i) Identify the correct unit for sediment long axis size in Figure 5a.

(1)

☒	**A** mm
☒	**B** m^2
☒	**C** mm^3
☒	**D** m/s

(ii) Calculate the mean gradient on Figure 5a.

Give your answer to one decimal place.

You must show all your workings in the space below.

(2)

.....°

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Using the data in Figure 5a:

(iii) plot the points for Site 4 and Site 7 on Figure 5b.

(2)

Beach variable (units)

Sediment long axis size (?)

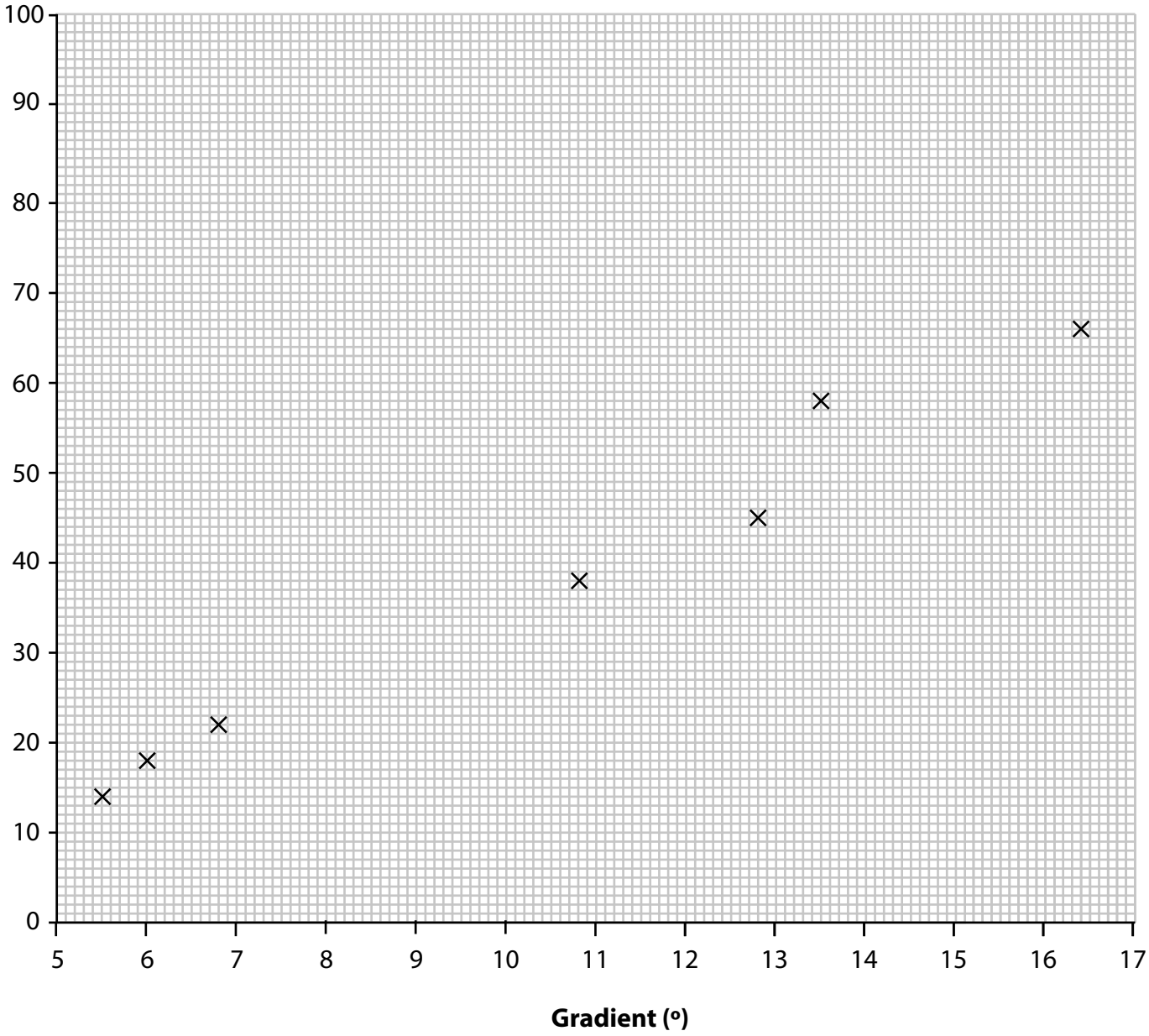

Figure 5b

(iv) draw a line of best fit on Figure 5b.

(1)

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(v) explain **one** reason for the relationship shown on Figure 5b.

(2)

(b) Study Figure 5c in the Resource Booklet. It shows information about the sampling strategy used to collect beach data.

Explain **one** advantage and **one** disadvantage of using this sampling strategy.

(4)

Chosen sampling strategy

Advantage

Disadvantage

You have studied coastal processes as part of your own geographical enquiry.

(c) Evaluate the accuracy of your conclusions.

(8)

Enquiry question

(Total for Question 5 = 20 marks)

If you answer Question 6 put a cross in the box ☐ .

6 Investigating hazardous environments

Study Figure 6a in the Resource Booklet. It shows the data collected for an investigation about a tropical storm.

(a) (i) Identify the correct unit for air pressure in Figure 6a.

(1)

☒	**A** mm
☒	**B** m^2
☒	**C** mb
☒	**D** °C

(ii) Calculate the mean wind speed in Figure 6a.

Give your answer to one decimal place.

You must show all your workings in the space below.

(2)

..... knots

Using the data in Figure 6a:

(iii) plot the points for Day 4 and Day 7 on Figure 6b.

(2)

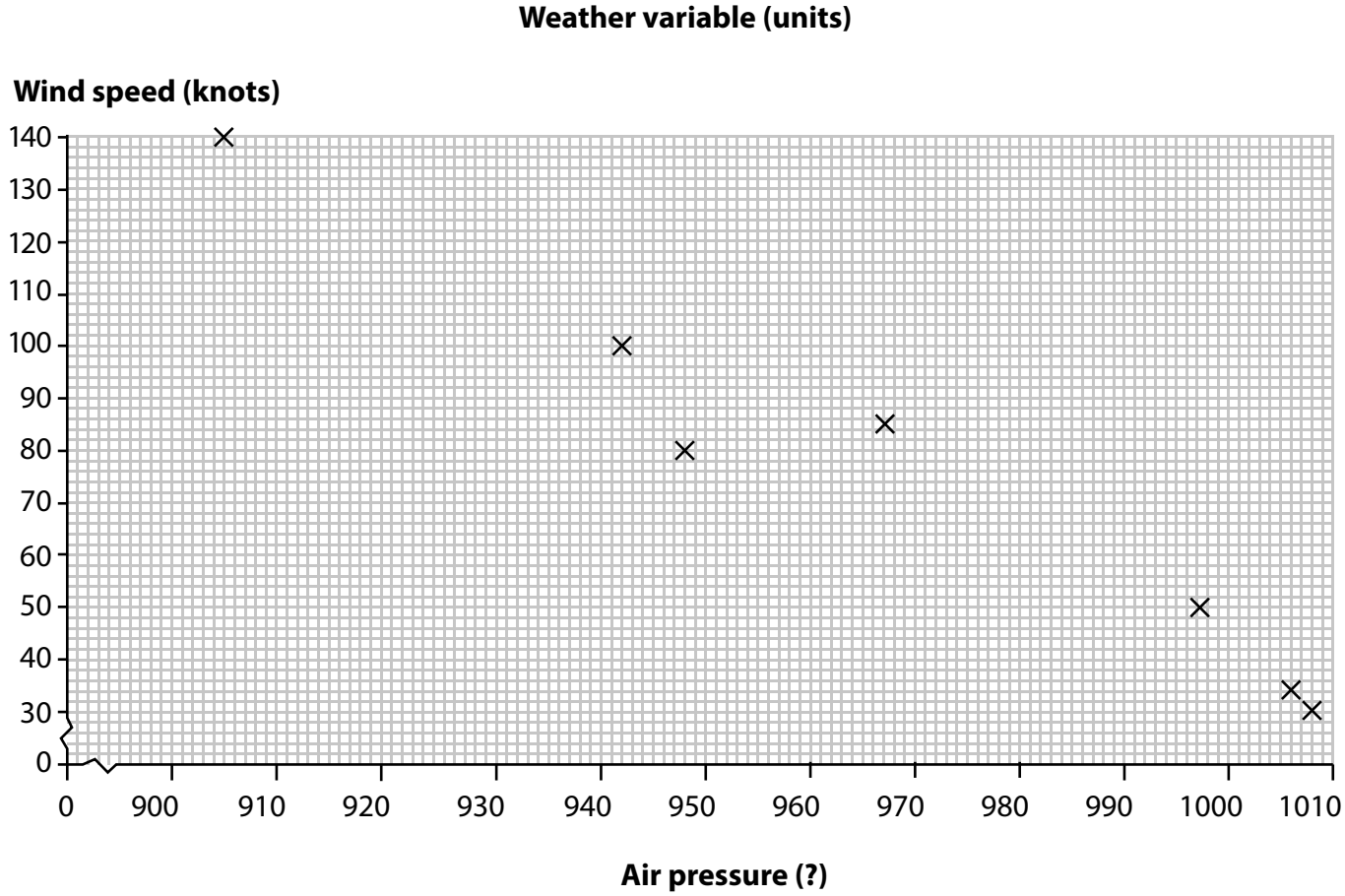

Figure 6b

(iv) draw a line of best fit on Figure 6b.

(1)

(v) explain **one** reason for the relationship shown on Figure 6b.

(2)

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(b) Study Figure 6c in the Resource Booklet. It shows information about the sampling strategy used to collect weather data.

Explain **one** advantage and **one** disadvantage of using this sampling strategy.

(4)

Chosen sampling strategy

Advantage

Disadvantage

You have studied the physical processes involved in an extreme weather event as part of your own geographical enquiry.

(c) Evaluate the accuracy of your conclusions.

(8)

Enquiry question

(Total for Question 6 = 20 marks)

TOTAL FOR SECTION B = 20 MARKS
TOTAL FOR QUESTION PAPER = 70 MARKS

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Pearson Edexcel International GCSE

Geography

Level 1/2

Paper 1: Physical geography

Sample assessment material for first teaching September 2017

Resource Booklet

Paper Reference

4GE1/01

Do not return this Resource Booklet with the question paper.

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SECTION A

The following resource relates to Question 1.

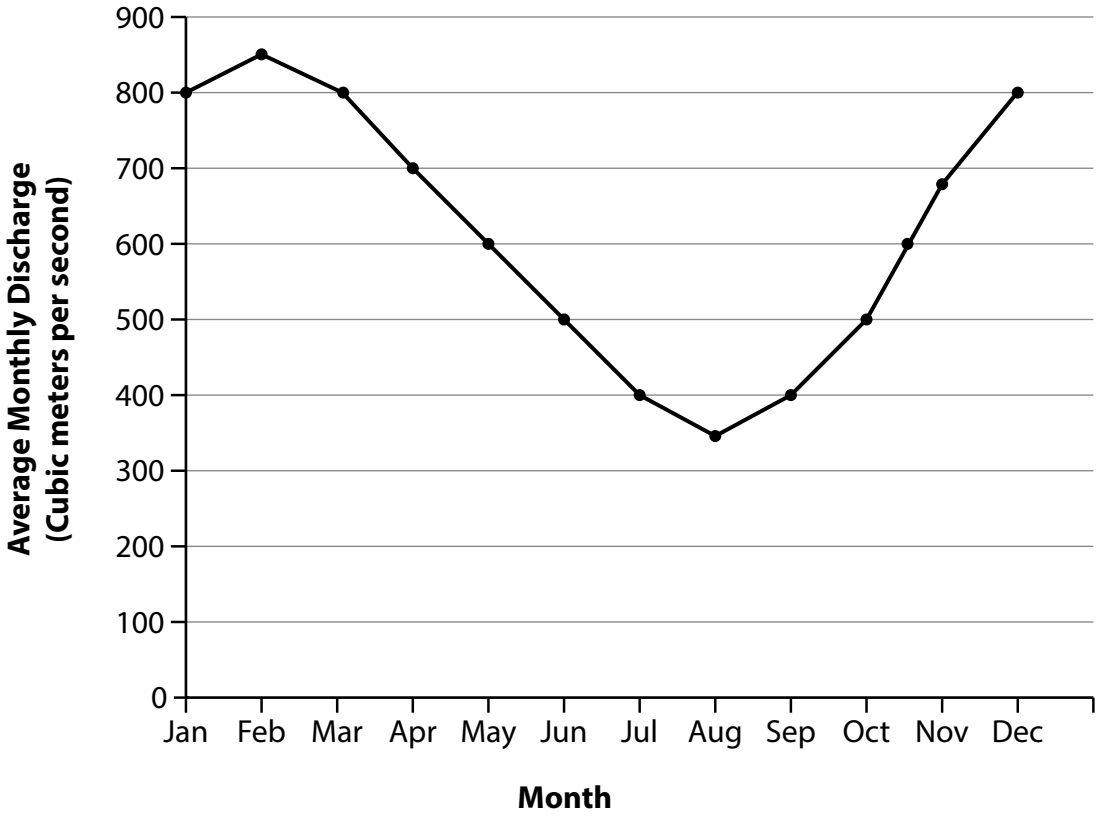


Figure 1a

River regime of the River Severn in England

The following resource relates to Question 1.

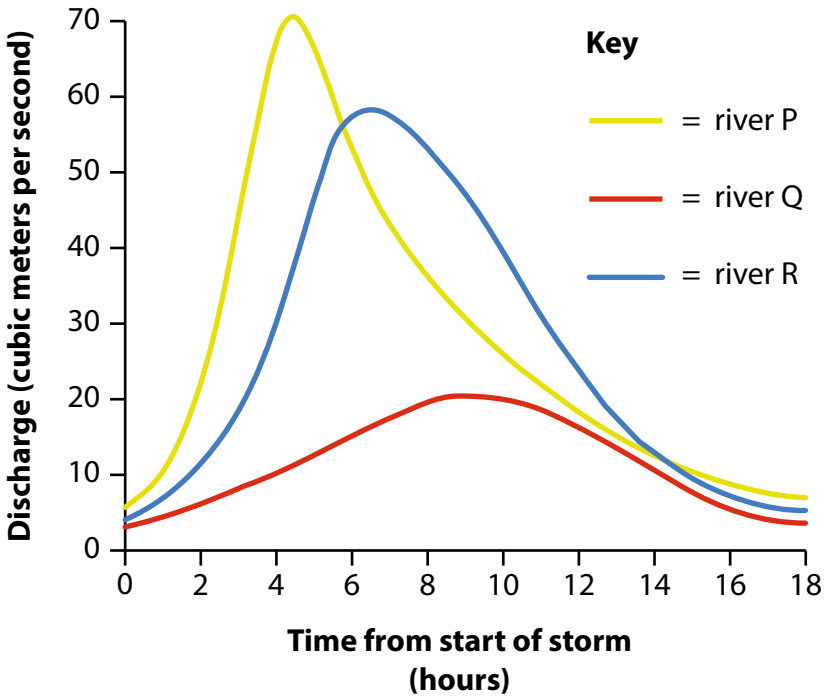
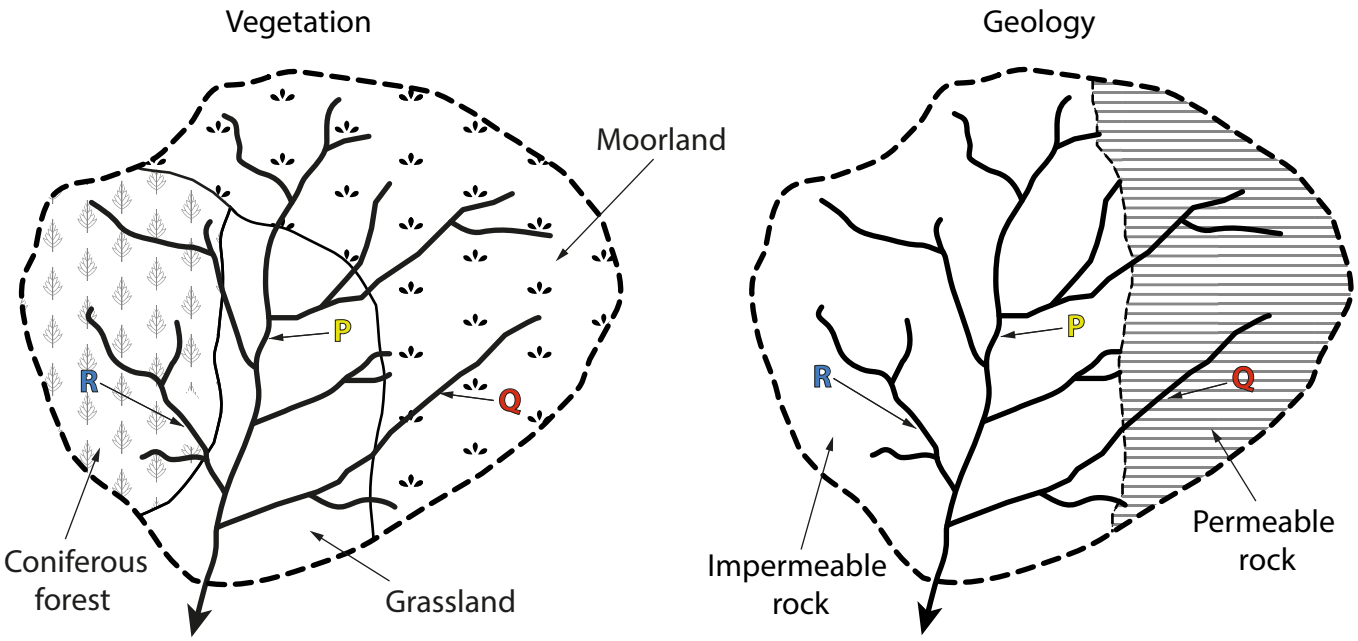


Figure 1c

Hydrograph for river P, river Q and river R



Key

P = hydrograph station on river P

Figure 1d

Types of vegetation and geology in the drainage basin of river P, river Q and river R

The following resource relates to Question 2.

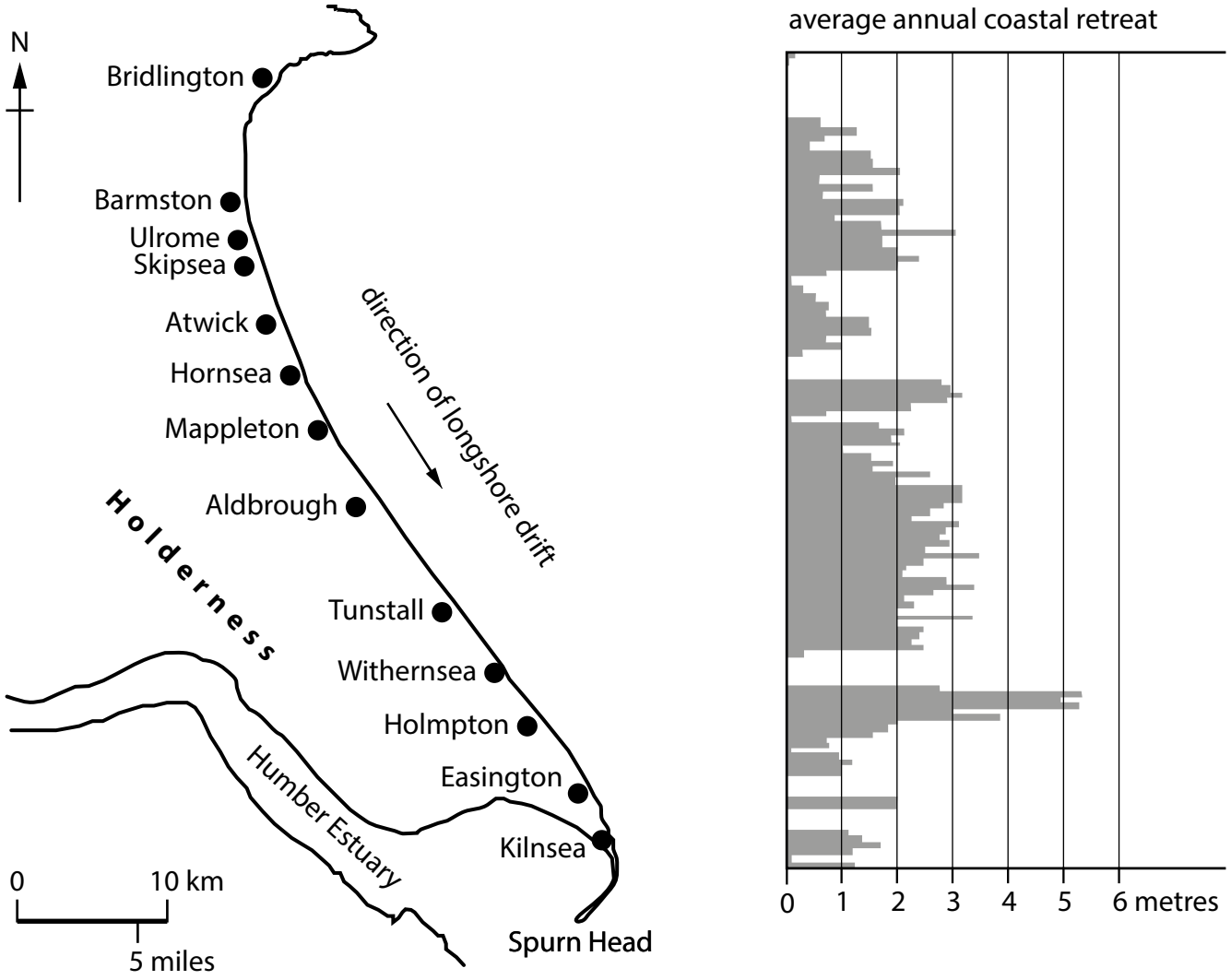
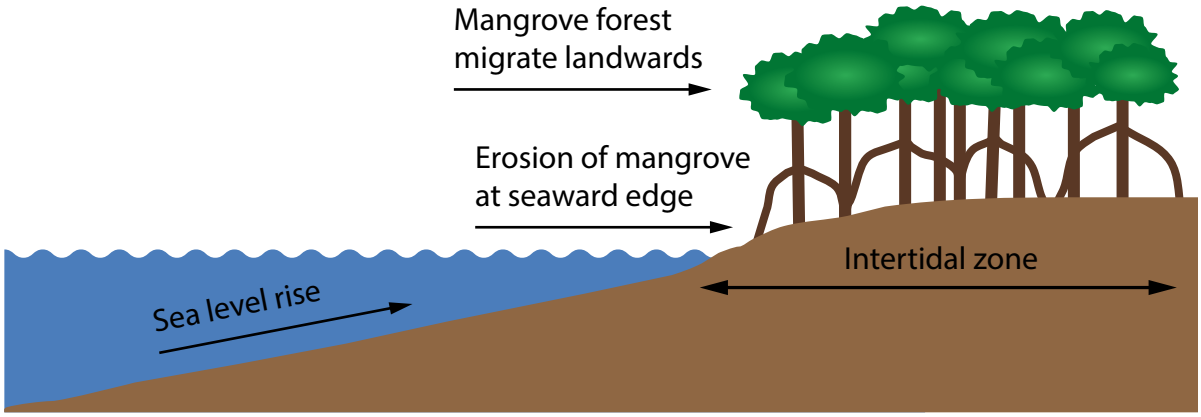


Figure 2a

Coastal retreat along the Holderness coastline in England

The following resource relates to Question 2.

Without sea defences



With sea defences

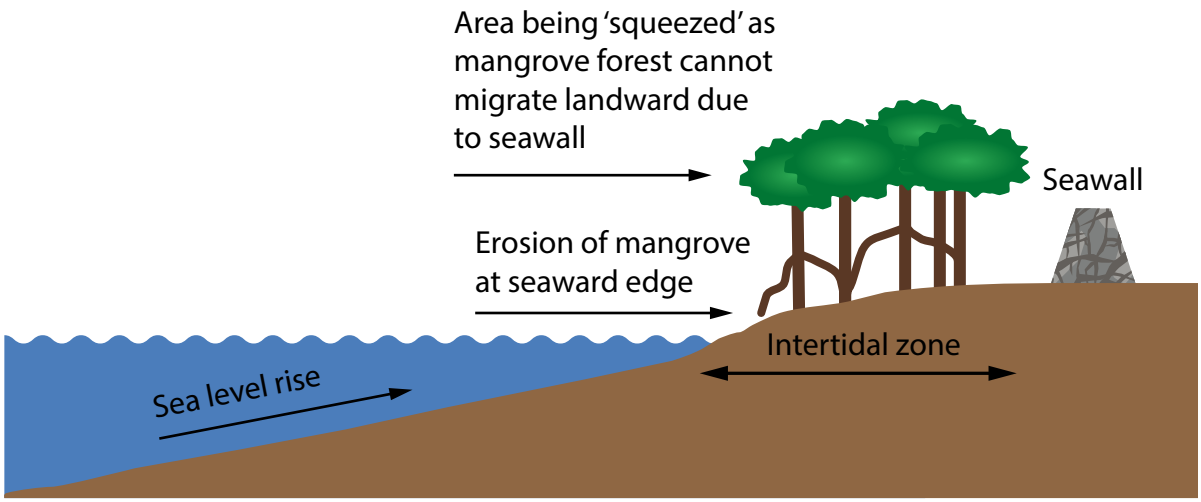


Figure 2c

Impact of building sea defences in areas with a mangrove ecosystem

The following resources relate to Question 2.

Figure 2d

A planned development project in an area with a mangrove ecosystem

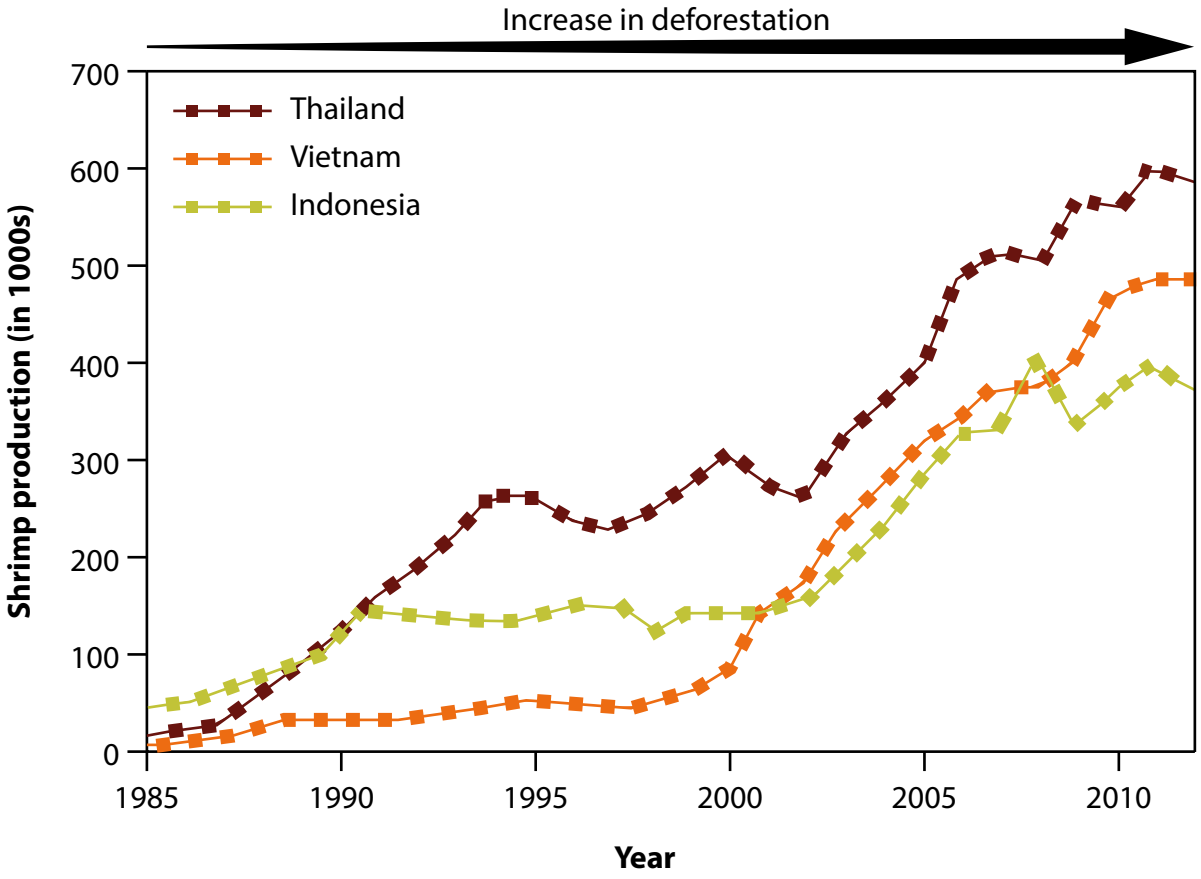


Figure 2e

Shrimp production in areas of mangrove forest, 1985-2010

The following resources relate to Question 3.

Africa	Americas	Asia	Europe	Oceania
53	10,035	73,999	284	632

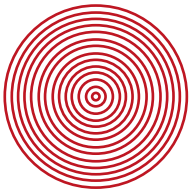
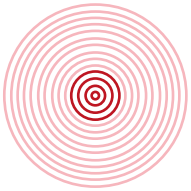
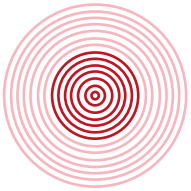
Very High Human Development (VHHD)	High Human Development (HHD)	Medium Human Development (MHD)	Low Human Development (LHD)
5,188	56,744	12,599	10,470

(Source: Adapted from ED-DAT, CRED 2016 World Disaster Report)

Figure 3a

Number of people affected by earthquakes, in thousands, (2006-2015) by region and level of development.

The following resources relate to Question 3.

	China	Italy	Haiti
	 12 May 2008	 6 April 2009	 12 Jan 2010
Magnitude	**7.9**	**6.3**	**7.0**
Amplitude	Each step in magnitude = 10 times increase in amplitude (amount ground moves) 		
Deaths	87 476	295	230 000
Gross Domestic Product (GDP) per person, 2014	$7 590	$35 223	$824

Short term impacts of earthquake

China

Italy

Haiti

(Source for China image: © Andy Wong/AP/Press Association Images)
(Source for Italy image: © Marco Di Lauro/Stringer)

Figure 3c

Information about three different earthquakes

SECTION B

The following resource relates to Question 4.

Site number	Channel variable (units)	
	Width (m)	Velocity (?)
1	1.4	0.6
2	1.5	0.8
3	1.8	1.5
4	2.1	2.5
5	2.8	2.8
6	2.8	3.2
7	3.5	3.2
8	4.0	3.8
9	5.5	4.3

Figure 4a

River data collected by a group of students

The following resource relates to Question 4.

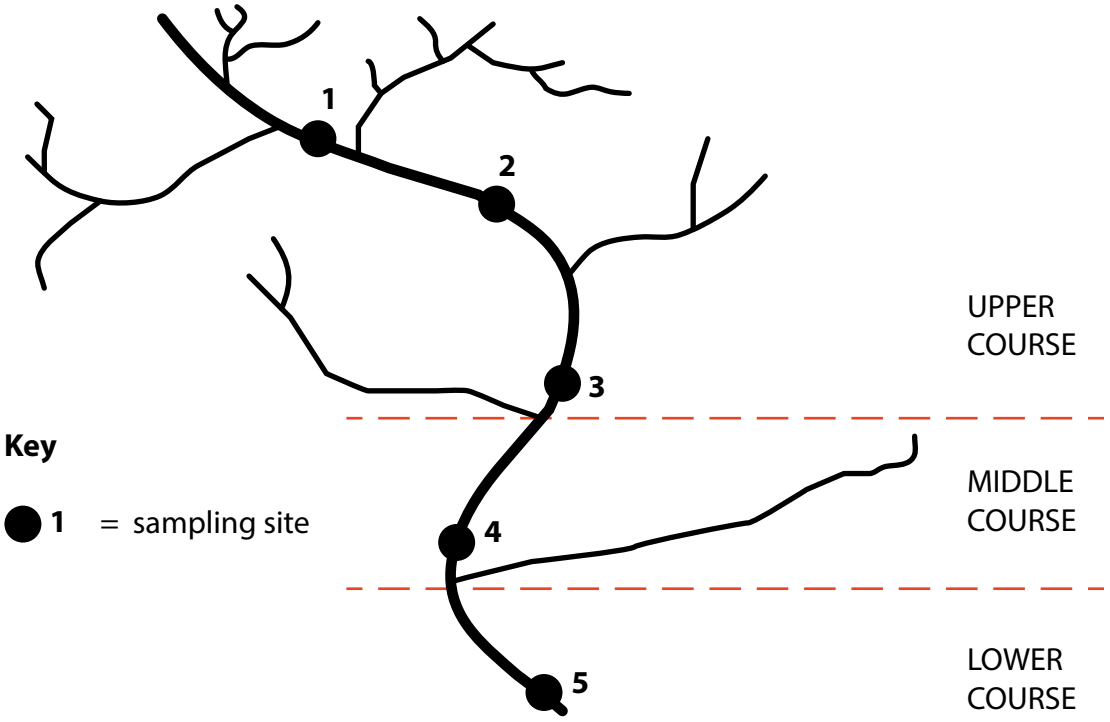


Figure 4c

Sampling strategy used by students to collect river data

The following resource relates to Question 5.

Site number	Beach variable (units)	
	Gradient (°)	Sediment long axis size (?)
1	15.4	66
2	13.5	58
3	12.8	45
4	12.1	45
5	10.8	38
6	6.8	22
7	6.5	22
8	6.0	18
9	5.5	14

Figure 5a

The following resource relates to Question 5.

Beach data collected by a group of students

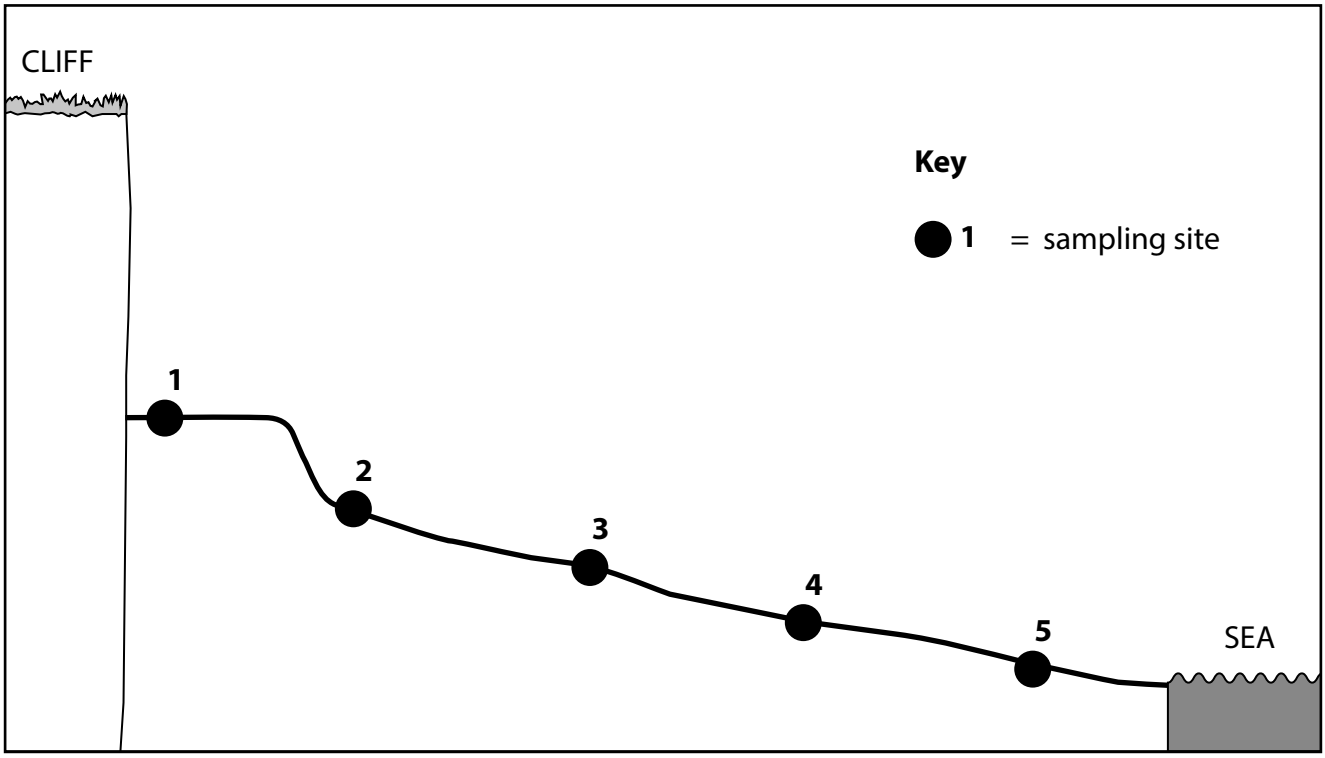


Figure 5c

Sampling strategy used by students to collect beach data

The following resource relates to Question 6.

Day number	Weather variable (units)	
	Air pressure (?)	Wind speed (knots)
1	1008	30
2	1006	35
3	997	50
4	983	70
5	968	85
6	942	100
7	930	125
8	905	140
9	948	80

Figure 6a

Weather data collected by a group of students

The following resource relates to Question 6.

Weather Diary: August 2015	
Date for data collection	Time for data collection
23rd August	6:00pm
24th August	6:00pm
25th August	6:00pm
26th August	6:00pm
27th August	6:00pm

Figure 6c

Sampling strategy used by students to collect weather data

Paper 1: Physical geography mark scheme

Question number	Answer	Mark
1(a)	**AO1 (1 mark)** C Movement of water through the rocks below the soil	**(1)**

Question number	Answer	Mark
1(b)(i)	**AO1 (1 mark)** B Abrasion	**(1)**

Question number	Answer	Mark
1(b)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following. • Climate/temperature/rainfall (1). • Slope/gradient (1). • Geology/resistance of rocks (1). • Altitude (1). • Aspect (1). • Velocity/energy (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark (AO1) for a point about physical weathering and 1 mark (AO2) for further explanation, up to a maximum of 2 marks. • Rocks on the valley side expand when hot and contract when cold (1). If a rock is heated and cooled many times, this can result in cracks forming and/or pieces of rock breaking off (1). • The wind can blow tiny grains of sand against a rock (1), which can result in the rock wearing away (1). • When water gets into rocks in the river valley and freezes, it expands (1), which can result in it pushing the crack further apart until it breaks the rock (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(c)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark (AO2) for a factor that may have led to this river regime and a further 1 mark (AO3) for its impact on the river regime shown on Figure 1a, up to a maximum of 2 marks each. • Discharge is much lower in the period May/June to October as rainfall is normally lower than at other times of the year (1). This means that there will be less surface run-off into the river (1). • Discharge is much lower in the period May/June to October because there might be higher temperatures (1). This means that more of the water in the river is evaporated (1). • Discharge is higher in the period November to April because there might be less vegetation growing in the area at that time of year (1). This reduces the amount of interception (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(d)	**AO2 (3 marks)** Award 1 mark for identification of an impact and 2 marks for development and further explanation, up to a maximum of 3 marks. • In villages in the developing world, people have many uses for river water (1), e.g. washing bodies/washing pots/disposing of human waste (1). This means that people in the next village will have to drink this polluted water (1). • Smoke from chimneys/cars can contain harmful chemicals (1), such as those which create acid rain (1). These can find their way into the water supply via surface run-off/throughflow/groundwater flow (1). • Farmers spray chemicals onto fields and crops to maximise yields (1), such as pesticides to kill insects (1), which can soak into the soil/get washed into the river when it rains (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(e)	**AO3 (1 mark)** Award 1 mark for the following. • Levee (1)	**(1)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark)/AO2 (3 marks)** Award 1 mark for initial point (AO1), and 3 further marks (AO2) for the extension of this point up to maximum of 4 marks. • Waterfalls occur where a band of hard rock overlies a softer rock (1). This softer rock is eroded more quickly than the harder rock (1) and, over time, this creates an overhang of hard rock (1). This overhang is unsupported so it collapses (1). Accept any other appropriate response.	**(4)**

Question number	Answer
1(g)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Different types of geology have different effects on the rates of infiltration and run-off into a river following a rainfall event. • Permeable rocks and soils (such as limestone) absorb water/allow water to pass through easily, so surface run-off is rare because a greater amount of infiltration takes place. • Impermeable rock and soils (such as shales) are more closely packed. Rainwater cannot infiltrate so water reaches the river more quickly via surface run-off/overland flow. • In rural areas, land use can affect infiltration rates and, therefore, the hydrograph for a river. • Areas of woodland and forest will have higher interception rates than areas of arable or pastoral farming. This increased interception will increase the time it takes for the rainfall to reach the river, increasing lag times and reducing the steepness of the rising and receding limbs on a hydrograph. • Areas of little vegetation or deforestation will mean that there is less interception and the rain reaches the ground faster. The ground is likely to become saturated and surface run-off will increase.

	AO4 • Figure 1d shows that river Q is located in an area of permeable rock. Also, Figure 1c shows that it has a larger lag time and a low peak discharge of just over 20 cumecs. • Figure 1d shows that rivers P and R are on impermeable rock. This is supported by the steep rising limbs and shorter lag times for these rivers in Figure 1c. • Figure 1d shows that rivers P and R are located in areas of the same geology (impermeable rock), but the two rivers are located in areas of different vegetation. • As river P has the 'flashier' hydrograph (Figure 1c), it is concluded that in this area, geology is having a greater impact on a river's discharge compared to types of vegetation.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
2(a)	**AO1 (1 mark)** B Beach nourishment (1)	**(1)**

Question number	Answer	Mark
2(b)(i)	**AO1 (1 mark)** A Hydraulic action (1)	**(1)**

Question number	Answer	Mark
2(b)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following. • Sliding (1). • Slumping (1). • Rotational slip (1). • Rock fall (1). • Mud flow (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
2(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark (AO1) for a point about biological weathering and 1 mark (AO2) for further explanation, up to a maximum of 2 marks. • Animals burrow into cracks (1) and, over time, this widens the cracks, causing the rocks to break apart (1). • Algae/lichens/bacteria/mosses often grow on rock surfaces (1) and produce weak acids that can convert some of the minerals to clay (1). • Weeds/plant roots can get into cracks of rocks and grow from there (1). As the plant grows bigger, the roots grow bigger and deeper, which widen the cracks and splits up the rock (1).	**(2)**

Question number	Answer	Mark
2(c)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark (AO2) for a factor that could affect the rate of retreat and a further mark (AO3) for its impact on the coastline, shown on Figure 2a, up to a maximum of 2 marks each. • Coastal retreat is generally higher in the south because waves could be stronger there (1), possibly because areas in the north are protected by Flamborough Head (1). • Coastal retreat is generally higher in the south because the geology/rocks might be less resistant than those further north (1), which means that they will be eroded more quickly by the waves (1). • Variations in coastal retreat are possibly the result of different amounts of coastal management (1), which could increase or decrease coastal processes/longshore drift (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
2(d)	**AO2 (3 marks)** Award 1 mark for identification of a cause and 2 marks for development through further explanation, up to a maximum of 3 marks. • There has been a sudden rise in sea level (1) caused by a storm surge/very strong winds (1), which push the water on an ocean's surface on top of more water (1). • Rising sea levels (1) due to climate change/isostatic rebound (1) will mean that more low-lying areas are vulnerable (1). • An area can flood if there is a tsunami (1) resulting from an earthquake/volcanic eruption/meteor impact (1), which causes a major displacement of water in the ocean and, consequentially, coastal flooding (1). • Some coastal settlements have developed on reclaimed land (1), which is characteristically low-lying and flat (1), so a small rise in sea level from a mild storm surge is enough to flood it and cause extensive damage (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
2(e)	**AO3 (1 mark)** Award 1 mark for the following. • Wave-cut platform (1)	**(1)**

Question number	Answer	Mark
2(f)	**AO1 (1 mark)/AO2 (3 marks)** Award 1 mark for initial point (AO1), and 3 further marks (AO2) for the extension of this point up to maximum of 4 marks. • A spit develops where there is a sudden change in the shape of the coastline (1), such as at a headland/river estuary (1). Longshore drift deposits material away from the coastline (1) and continues to do so in this direction, leading to the growth of a spit (1). Accept any other appropriate response.	**(4)**

Question number	Answer
2(g)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Natural landward migration of a coastal ecosystem may result from a rise in sea level, extreme weather and particularly high spring tides. • Mangrove forests are often cleared to make room for agricultural land, human settlements and infrastructure, such as a harbour. More recently, mangroves have been cleared for tourist developments, shrimp aquaculture and salt farms. • Trees in coastal ecosystems are cut down for a range of different reasons, such as for firewood, construction wood, woodchip and pulp production, charcoal production and animal fodder. • In some coastal areas, afforestation and replanting programmes are replacing those trees that have been cut down but, in some parts of the world, it is no longer sustainable, threatening the biodiversity of the ecosystem. • Dams and irrigation systems can reduce the amount of water in some coastal ecosystems, changing the salinity level of water in the area. If salinity becomes too high, several animal and plant species may not be able to survive and biodiversity falls. In addition, increased erosion due to land deforestation can massively increase the amount of sediment in rivers. • A growing use of chemical fertilisers, pesticides, and other toxic man-made chemicals carried by river systems from sources upstream, can kill animals living in mangrove forests, while oil pollution can smother mangrove roots and suffocate the trees. **AO4** • Figure 2c shows the natural landward migration of mangrove and the negative impact of building a sea defence, such as a sea wall. The sea wall, while protecting some areas from a rise in sea level, has prevented further landward migration. • Figure 2d shows an example of planning for the development of tourism, as some countries are in the process of doing. Despite some of the mangrove ecosystem remaining, much of it may be cut down to make way for new infrastructure. • Figure 2e shows how the growth in shrimp production in Thailand, Vietnam and Indonesia has a negative relationship with the size of the mangrove forest in these countries.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
3(a)	**AO1 (1 mark)** D Earthquake (1)	**(1)**

Question number	Answer	Mark
3(b)	**AO1 (1 mark)** B There is a plume of magma below the surface (1)	**(1)**

Question number	Answer	Mark
3(c)(i)	**AO1 (1 mark)** Award 1 mark for any of the following: • Training/educating people (1). • Emergency drills (1) • Availability of emergency kits (1). • Earthquake-proof building design (1) • Roads and bridges specially strengthened (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
3(c)(ii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark for identification of a reason and a further mark for an explanation of the reason, up to a maximum of 2 marks: • Management / security of local water supplies (1) so that sanitation conditions are improved (1). • Use of emergency aid to help people with injuries (1) which means that treatment of people should save lives (1). • NGOs donating food / shelter to affected people (1) so that they are protected from exposure and weather conditions (1). • Burying any dead who suffered from the collapse of buildings (1) to stop the spread of diseases (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
3(d)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark (AO3) for identification of an idea from the data in Figure 3a and a further mark for an explanation of the reason (AO2), up to a maximum of 2 marks each: • Countries with HHD have the most significant proportion of people affected (56,774,000) (1) because they have higher vulnerability due to a greater number of cities that can be affected by earthquakes (1). • Asia and Americas have the greatest numbers of people affected compared to other regions (1). This may be due to the larger numbers of people living there (1). • Places with VHHD have the lowest numbers of people affected (1) as they may have best earthquake warning systems / largest number of earthquake-proof buildings reducing injury (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
3(e)	**AO2 (3 marks)** Award 1 mark for identification of an impact and 2 marks for development through further explanation, up to a maximum of 3 marks. • People can be killed by pyroclastic flows (1) as they travel so fast that people cannot outrun them (1) and so they are burnt to death or choke to death (1). • Pyroclastic flows damage/destroy buildings, roads, crops, stock (animals) and woods (1), which could lead to the long-term evacuation of an area (1) and, therefore, to a decline in the local economy (1). • Mudflows (lahars) often cause a lot of damage to the environment (1) as a result of the boulders/logs carried within them crushing everything in their path (1). People caught in the path of a lahar have a high risk of death from severe crush injuries, drowning or asphyxiation (1). • Lava flows burn or bury everything they come across (1). They may also start fires, which are a lot more dangerous for the environment around the volcano (1), and kill more people than the lava flow itself (1). • Ash falls can cause houses and buildings to collapse (1). People and animals may die due to a lack of oxygen (1). Huge problems are created for the aviation industry (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
3(f)	**AO3 (1 mark)** Award 1 mark for any of the following. • Fertile soils/high crop yield/growing crops (1) • Beautiful scenery (1)	**(1)**

Question number	Answer	Mark
3(g)	**AO1 (1 mark)/AO2 (3 marks)** Award 1 mark for initial point (AO1), and 3 further marks (AO2) for the extension of this point up to maximum of 4 marks. • Two tectonic plates move/converge together (1). The denser plate is subducted/pushed under and sinks into the mantle (1) where it melts due to the intense friction/pressure/heat (1). Some of this molten material can erupt through the surface as a volcano (1). Accept any other appropriate response.	**(4)**

Question number	Answer
3(h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Some countries in the world that experience earthquakes have a high level of economic development so can afford to spend more money on improving the country's infrastructure, e.g. earthquake-proof buildings, warning systems and rescue services, than countries at a lower level of development. • Countries that, with effective warning systems, rescue services, medical services, education systems and building design, tend to have less damage from an earthquake. • Countries that are less economically developed cannot afford to spend as much money to protect themselves from earthquakes, so it is likely that these areas will have a higher death toll, even if the magnitude of an earthquake is the same as the magnitude in a more-developed country.

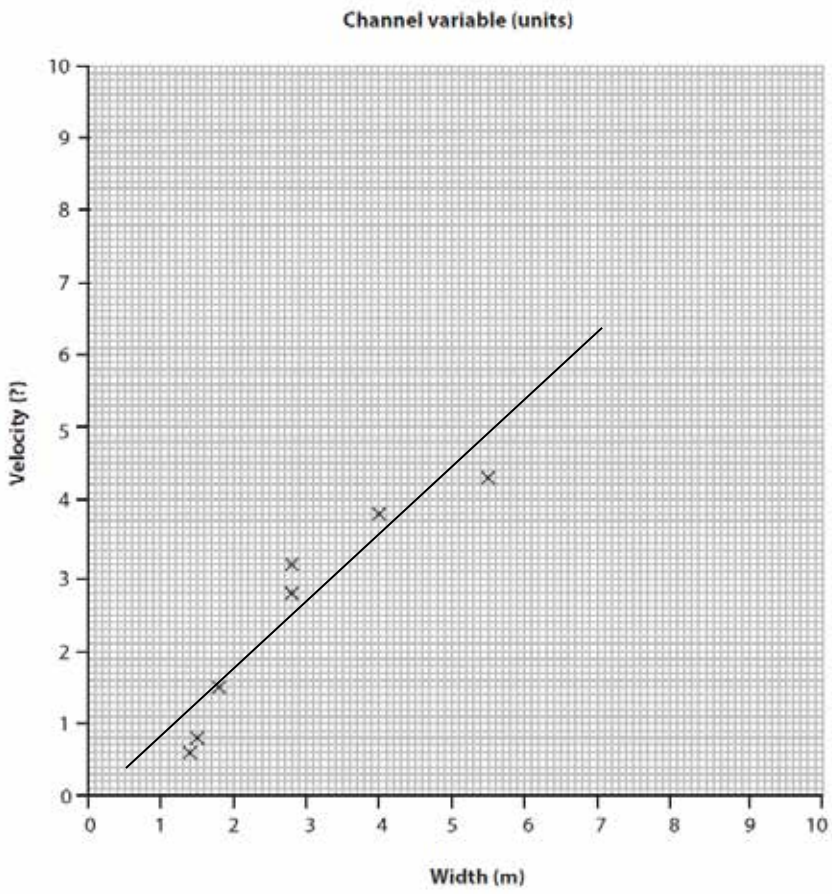
	• More-developed countries can afford to spend money on prediction methods, such as GPS satellite (when data is sent from satellites to computers with information such as plate movement and changes in the earth's surface). In the developing world, communication systems may be underdeveloped, so the population may not be well educated about what to do in the event of an earthquake. • Construction standards tend to be poorer in less-developed countries. Homes and other buildings suffer serious direct damage when the disaster occurs. Buildings collapsing result in high death tolls. Evacuation and other emergency plans are also difficult to put into action due to limited funds and insufficient resources. Clearing up can be difficult. There may not be enough money to rebuild homes quickly and safely, which leads to many people being forced to live in emergency housing or refugee camps – which can increase the death toll. **AO4** • Figure 3c shows that the earthquake in China had a much larger magnitude (7.9) compared with Haiti (7.0). Italy's earthquake had the smallest magnitude (6.3) and the lowest number of deaths (295). This suggests that there might be a relationship between magnitude and deaths. • Figure 3c shows that, despite having a smaller magnitude than China, the earthquake in Haiti led to the largest number of deaths (230 000) – more than double that experienced in China (87 476). • Figure 3c shows that Italy's earthquake had both the smallest amplitude and magnitude, whereas China had both the largest amplitude and magnitude. • Figure 3c shows many collapsed buildings, with almost total devastation in Haiti and China as a result of the earthquakes. On the other hand, the photograph for Italy does show some buildings still standing and rescue services on the scene, which may explain the smaller number of deaths in that region. • Figure 3c shows that Italy has the highest GDP per capita, which could be used to explain why it had so few deaths from the earthquake. China has a higher GDP per capita than Haiti, which might explain why, despite a large earthquake, there were fewer deaths.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
4(a)(i)	**AO3 (1 mark)** B m/s (1)	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 1.4 + 1.5 + 1.8 + 2.1 + 2.8 + 2.8 + 3.5 + 4.0 + 5.5 = 25.4 (1) The division of this number by 9, the total number of sampling sites, arriving at a mean, to one decimal place, of 2.8 (1). Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
4(a)(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	**(2)**

Question number	Answer	Mark
4(a)(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows that width increases with velocity.  	**(1)**

Question number	Answer	Mark
4(a)(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • An increase in velocity will cause more (hydraulic) erosion (1), which will cause the channel to widen (1). • Wider rivers could have a larger hydraulic radius (1), which means that there is less friction, increasing velocity (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (4 marks)** Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as a random sampling grid doesn't necessarily have to be used as sampling, it just has to be at uniform intervals (1) • sampling sites are an equal distance apart along the stretch of the river (1), which means that good coverage of the river can be more easily achieved than using random sampling (1) • sample sites are an equal distance apart (1), which ensures that no part of the river is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the river have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular pattern (1) • significant changes along the river might be missed (1), which might skew the results/give a slightly biased representation (1). Accept any other appropriate response.	**(4)**

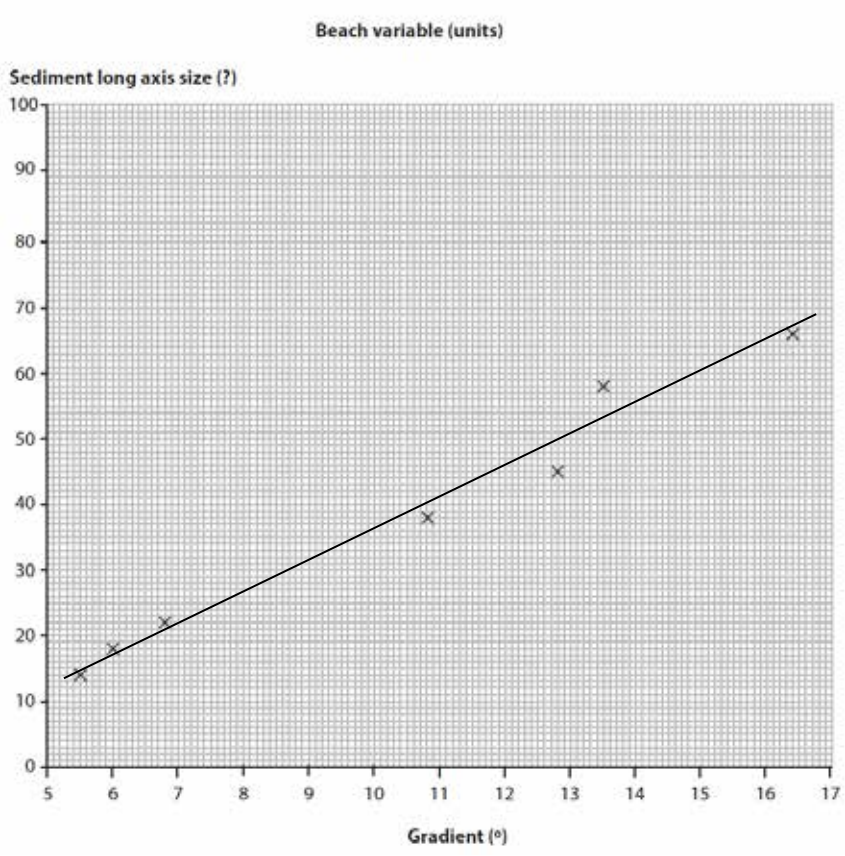
Question number	Answer
4(c)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Accuracy is about making judgements about how close conclusions are to the actual changes occurring in the river environment where the fieldwork was carried out. • Accuracy of conclusions will be most likely linked to evaluation of the data collection methods. • Recognition of the extent to which there were equipment errors, e.g. faulty or uncalibrated equipment, and/or operator errors, e.g. misinterpreting the data being recorded, and how this might have affected the accuracy of the results. • Recognition of whether there were issues with the design of the data collection and/or sampling methodologies, which may be flawed in terms of the location/number of sites (spatial), the time of year (temporal), or the equipment chosen. • A supported judgement is reached about the accuracy of conclusions, drawing on evidence such as strengths, weaknesses, alternatives and relevant data. **Do not credit responses that make reference to how far the conclusions can be trusted (validity of conclusions) or the extent to which the investigation can be repeated to obtain the same results/conclusions (reliability).** **AO4** • There is evidence of using different skills and techniques to measure changes in a river channel. • There is evidence of using different skills and techniques to analyse data and reach conclusions about changes occurring in a river channel. • There is evidence of using different skills and techniques to evaluate conclusions about changes occurring in a river channel. • There is evidence of own fieldwork conclusions, i.e. reference to field data collected by the student.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited, relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
5(a)(i)	**AO3 (1 mark)** A mm (1)	**(1)**

Question number	Answer	Mark
5(a)(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 15.4 + 13.5 + 12.8 + 12.1 + 10.8 + 6.8 + 6.5 + 6.0 + 5.5 = 89.4 (1) The division of this number by 9, the total number of sampling sites, arriving at a mean, to one decimal place, of 9.9 (1) Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
5(a)(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	**(2)**

Question number	Answer	Mark
5(a)(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows that the beach sediment long axis size increases with gradient.  	**(1)**

Question number	Answer	Mark
5(a)(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • Sites where beach particles are smaller are more easily compacted (1), which means the beach gradient will be smaller/more gently sloping (1). • There is less friction when waves are passing over smaller sediment (1) so more material will be carried back down the beach (1). • Areas of larger beach sediment allow more water to pass through (1), decreasing the effect of backwash erosion and increasing the formation of sediment into a steeply sloping beach (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
5(b)	**AO3 (4 marks)** Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as a random sampling grid doesn't necessarily have to be used as sampling, it just has to be at uniform intervals (1) • sampling sites are an equal distance apart along the beach profile (1), which means that good coverage of the beach can be more easily achieved than using random sampling (1) • sample sites are an equal distance apart (1), which ensures that no part of the beach profile is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the beach profile have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular pattern (1) • significant changes along the beach profile might be missed (1), which might skew the results/give a slightly biased representation (1). Accept any other appropriate response.	**(4)**

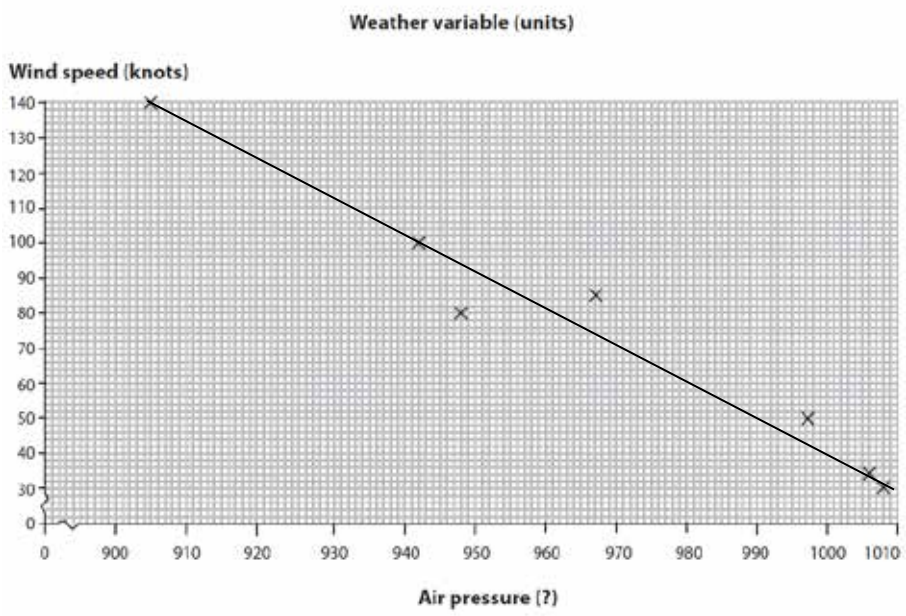
Question number	Answer
5(c)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Accuracy is about making judgements about how close conclusions are to the actual changes occurring in the coastal environment where the fieldwork was carried out. • Accuracy of conclusions will be most likely linked to evaluation of the data collection methods. • Recognition of the extent to which there were equipment errors, e.g. faulty or uncalibrated equipment, and/or operator errors, e.g. misinterpreting the data being recorded, and how this might have affected the accuracy of the results. • Recognition of whether there were issues with the design of the data collection and/or sampling methodologies, which may be flawed in terms of the location/number of sites (spatial), the time of year (temporal), or the equipment chosen. • A supported judgement is reached about the accuracy of conclusions, drawing on evidence such as strengths, weaknesses, alternatives and relevant data. **Do not credit responses that make reference to how far the conclusions can be trusted (validity of conclusions) or the extent to which the investigation can be repeated to obtain the same results/conclusions (reliability).** **AO4** • There is evidence of using different skills and techniques to measure coastal processes and form. • There is evidence of using different skills and techniques to analyse data and reach conclusions about coastal processes and form. • There is evidence of using different skills and techniques to evaluate conclusions about coastal processes and form. • There is evidence of own fieldwork conclusions, i.e. reference to the field data collected by the student.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
6(a)(i)	**AO3 (1 mark)** c mb (1)	**(1)**

Question number	Answer	Mark
6(a)(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 30 + 35 + 50 + 70 + 85 + 100 + 125 + 140 + 80 = 715 (1). The division of this number by 9, the total number of days, arriving at a mean, to one decimal place, of 79.4 (1) Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
6(a)(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	**(2)**

Question number	Answer	Mark
6(a)(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows wind speed increases with air pressure.  	**(1)**

Question number	Answer	Mark
6(a)(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • When air pressure is lower, warm air will rise (1) and cooler air will often move in to replace it more quickly, leading to stronger winds (1). • When air pressure is higher air is descending (1), which reduces the formation of cloud and leads to lighter winds (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
6(b)	**AO3 (4 marks)** Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as systematic sampling just has to be at uniform intervals during the time period (1) • sampling times are equally spaced out during the weather event (1), which means that good coverage of the event can be more easily achieved than using random sampling (where under- or over-representation may occur) (1) • sampling times are evenly spaced (1), which ensures that no part of the weather event is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the day/week have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular weather event (1) • significant changes during a weather event/throughout the year might be missed (1) which might skew the results/give a biased representation (1). Accept any other appropriate response.	**(4)**

Question number	Answer
6(c)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Accuracy is about making judgements about how close conclusions are to the actual changes occurring in the hazardous environment where the fieldwork was carried out. • Accuracy of conclusions will be most likely linked to evaluation of the data collection methods. • Recognition of the extent to which there were equipment errors, e.g. faulty or uncalibrated equipment, and/or operator errors, e.g. misinterpreting the data being recorded, and how this might have affected the accuracy of the results. • Recognition of whether there were issues with the design of the data collection and/or sampling methodologies, which may be flawed in terms of the location/number of sites (spatial), the time of year (temporal), or equipment chosen. • A supported judgement is reached about the accuracy of conclusions, drawing on evidence such as strengths, weaknesses, alternatives and relevant data. **Do not credit responses that make reference to how far the conclusions can be trusted (validity of conclusions) or the extent to which the investigation can be repeated to obtain the same results/conclusions (reliability).** **AO4** • There is evidence of using different skills and techniques to measure the physical processes involved in an extreme weather event. • There is evidence of using different skills and techniques to analyse data and reach conclusions about physical processes involved in an extreme weather event. • There is evidence of using different skills and techniques to evaluate conclusions about physical processes involved in an extreme weather event. • There is evidence of own fieldwork conclusions, i.e. reference to field data collected by the student.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Write your name here

Surname	Other names

Pearson Edexcel International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Geography

Level 1/2
Paper 2: Human geography

Sample assessment material for first teaching September 2017
Time: 1 hour 45 minutes

Paper Reference
4GE1/02

You must have:
Resource Booklet, calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- In Section A, answer two questions from Questions 1–3.
  In Section B, answer one question from Questions 4–6.
  In Section C, answer one question from Questions 7–9.
- Answer the questions in the spaces provided
  – there may be more space than you need.
- Calculators may be used.
- **You must show all your working out with your answer clearly identified at the end of your solution.**

Information

- The total mark for this paper is 105.
- The marks for **each** question are shown in brackets
  – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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Pearson

SECTION A

Answer TWO questions from this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If you answer Question 1 put a cross in the box ☐ .

1 Economic activity and energy

(a) (i) Identify the meaning of the term 'HEP'.

(1)

☒	**A** Hydroelectric power
☒	**B** Hydro-energetic power
☒	**C** Hydroelectric pulse
☒	**D** Hydrostatic energy power

(ii) Define the term 'renewable energy source'.

(1)

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(b) Identify the economic sector that includes activities such as web design and medical research.

(1)

☒	**A** Secondary
☒	**B** Tertiary
☒	**C** Quaternary
☒	**D** Primary

(c) Study Figure 1a in the Resource Booklet.

Explain **one** factor that could have influenced the location of the car manufacturing factory shown in Figure 1a.

(2)

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(d) (i) State **one** example of an economic activity in the primary sector.

(1)

(ii) Explain **two** reasons why the number of people employed in the primary sector has fallen in some parts of the world.

(4)

1

2

(e) Study Figure 1b in the Resource Booklet.

Suggest **one** reason for the changes in the tertiary and quaternary sectors shown in Figure 1b.

(3)

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(f) For a named developed country, explain **two** ways that energy resources are being managed in a sustainable way.

(4)

Named developed country .....

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(g) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the past and predicted changes in energy demand.

(8)

(Total for Question 1 = 25 marks)

If you answer Question 2 put a cross in the box ☒ .

2 Rural environments

(a) Identify the meaning of the term 'counter-urbanisation'.

(1)

☒	**A** Population movement from rural to urban areas
☒	**B** Increased unemployment in urban areas
☒	**C** Population movement from urban to rural areas
☒	**D** Increased unemployment in rural areas

(b) Define the term 'intensive farming'.

(1)

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(c) Identify **one** service provided by natural ecosystems.

(1)

☒	**A** Timber
☒	**B** Climate regulation
☒	**C** Food
☒	**D** Medicines

(d) Study Figure 2a in the Resource Booklet.

Explain **one** physical factor that could have influenced the type of farming shown in Figure 2a.

(2)

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(e) State **one** way that farmers can diversify to generate more income.

(1)

(f) Explain **two** reasons why a growth in tourism has had negative impacts on rural environments.

(4)

1

2

(g) Study Figure 2b in the Resource Booklet.

Suggest **one** reason for the change in the percentage of subsistence farmers affected by food shortages shown in Figure 2b.

(3)

(h) For a named developing **or** emerging country, explain **two** ways economic challenges are managed within rural environments.

(4)

Named developed country .....

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(i) Study Figure 2c in the Resource Booklet.

Analyse the reasons for the increase and decrease in size of agricultural areas.

(8)

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(Total for Question 2 = 25 marks)

If you answer Question 3 put a cross in the box ☒ .

3 Urban environments

(a) Identify the meaning of the term 'suburbanisation'.

(1)

☒	**A** Population growth on the edge of urban areas
☒	**B** Population movement from one country to another
☒	**C** Population growth in the centre of urban areas
☒	**D** Population movement from one urban area to another

(b) Define the term 'urbanisation'.

(1)

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(c) Identify **one** characteristic of a brownfield site.

(1)

☒	**A** A site that has never been built on before
☒	**B** A site that is protected for wildlife
☒	**C** A site that has previously been built on
☒	**D** A site that is only used for farming

(d) Study Figure 3a in the Resource Booklet.

Explain **one** piece of evidence that shows this is a central urban area.

(2)

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(e) (i) State **one** example of a megacity.

(1)

(ii) Explain **two** factors that have led to the growth of megacities.

(4)

1

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(f) Study Figure 3b in the Resource Booklet.

Suggest **one** reason for the differences in commuting patterns shown on Figure 3b.

(3)

(g) For a named developed country, explain **two** strategies used to manage the demands of waste disposal.

(4)

Named developed country .....

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(h) Study Figure 3c in the Resource Booklet.

Analyse the social and economic challenges associated with rapid urbanisation.

(8)

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(Total for Question 3 = 25 marks)

TOTAL FOR SECTION A = 50 MARKS

SECTION B

Geographical enquiry

Answer ONE question only from this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If you answer Question 4 put a cross in the box ☐ .

4 Investigating economic activity and energy

You have investigated approaches to developing energy resources as part of your own geographical enquiry.

(a) Describe **one** advantage of a sampling strategy used in your investigation.

(2)

Named sampling strategy .....

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(b) Describe **one** way in which the secondary data you collected supported your understanding of the investigation.

(3)

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(c) Explain **two** reasons for the technique(s) chosen, for example graph, map or diagram, to present your primary or secondary data/information.

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(d) Explain **one** factor that may have affected the reliability of your results.

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(e) Study Figure 4 in the Resource Booklet. It presents the data from a student's investigation on the changing use of energy.

The aim of the student's investigation was to investigate the changing use of energy in Dubai, a city in the United Arab Emirates.

The student carried out an environmental quality survey and annotated a digital photograph of transport management at one location in Dubai.

Evaluate the student's methods and results.

(8)

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(Total for Question 4 = 20 marks)

If you answer Question 5 put a cross in the box ☐ .

5 Investigating rural environments

You have investigated the changing use of rural environments as part of your own geographical enquiry.

(a) Describe **one** advantage of a sampling strategy used in your investigation.

(2)

Named sampling strategy .....

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(b) Describe **one** way in which the secondary data you collected supported your understanding of the investigation.

(3)

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(c) Explain **two** reasons for the technique(s) chosen, for example graph, map or diagram, to present your primary or secondary data/information.

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(d) Explain **one** factor that may have affected the reliability of your results.

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(e) Study Figure 5 in the Resource Booklet. It presents the data from a student's investigation on the changing use of rural environments.

The aim of the student's investigation was to investigate how the rural environment has been changed by people in Andhra Padesh, a rural area in India.

The student carried out an environmental quality survey and annotated a digital photograph of the rural environment at one location within Andhra Pradesh.

Evaluate the student's methods and results.

(8)

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(Total for Question 5 = 20 marks)

If you answer Question 6 put a cross in the box ☐ .

6 Investigating urban environments

You have investigated the changing use of central/inner urban environments as part of your own geographical enquiry.

(a) Describe **one** advantage of a sampling strategy used in your investigation.

(2)

Named sampling strategy .....

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(b) Describe **one** way in which the secondary data you collected supported your understanding of the investigation.

(3)

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(c) Explain **two** reasons for the technique(s) chosen, for example graph, map or diagram, to present your primary or secondary data/information.

(4)

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(d) Explain **one** factor that may have influenced the reliability of your results.

(3)

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(e) Study Figure 6 in the Resource Booklet. It presents the data from a student's investigation on the changing use of central/inner urban environments.

The aim of the student's investigation was to investigate how the urban environment has been changed by people in Dublin, an urban area in Ireland.

The student carried out an environmental quality survey and annotated a digital photograph of the urban environment at one location within Dublin.

Evaluate the student's methods and results.

(8)

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(Total for Question 6 = 20 marks)

TOTAL FOR SECTION B = 20 MARKS

SECTION C

Global issues

Answer ONE question only from this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If you answer Question 7 put a cross in the box ☐ .

7 Fragile environments and climate change

(a) (i) Identify **one** greenhouse gas.

(1)

☒	**A** Nitrogen
☒	**B** Oxygen
☒	**C** Argon
☒	**D** Methane

(ii) State **one** natural cause of climate change.

(1)

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(b) (i) Define the term 'desertification'.

(1)

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(ii) Study Figure 7a in the Resource Booklet.

Name **two** countries labelled in Figure 7a that have severe desertification and land degradation.

(2)

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(iii) Suggest **two** possible reasons for the pattern shown in Figure 7a.

(4)

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(c) Explain **two** causes of deforestation.

(4)

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(d) Study Figure 7b in the Resource Booklet.

(i) Calculate the percentage increase in carbon dioxide concentrations between 1900 and 2010.

You must show all your workings in the space below.

(2)

.....%

(ii) Identify the extent to which carbon dioxide concentrations and annual average global temperature has changed over time in Figure 7b.

(2)

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(e) Study Figure 7c in the Resource Booklet.

Assess the effects of climate change on fragile environments.

(6)

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(f) Discuss the view that it is possible to manage the threats of climate change in a sustainable way.

Use Figures 7a, 7b and 7c from the Resource Booklet, and your own knowledge and understanding to support your answer.

(12)

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(Total for Question 7 = 35 marks)

If you answer Question 8 put a cross in the box ☐ .

8 Globalisation and migration

(a) (i) Identify **one** reason for economic migration.

(1)

☒	**A** Go to university
☒	**B** Get married
☒	**C** Find a job
☒	**D** Retire from work

(ii) State **one** economic push factor leading to rural-urban migration.

(1)

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(b) (i) Define the term 'voluntary migration'.

(1)

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(ii) Study Figure 8a in the Resource Booklet.

Name **two** countries labelled in Figure 8a with a net gain in the number of migrants.

(2)

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(iii) Suggest **two** possible pull factors for the pattern shown on Figure 8a.

(4)

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(c) Explain **two** benefits to countries hosting transnational corporations (TNCs).

(4)

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(d) Study Figure 8b in the Resource Booklet.

(i) Calculate the percentage increase in total manufacturing for Asia Pacific between 2005 and 2011.

You must show all your workings in the space below.

(2)

.....%

(ii) Identify the extent to which total manufacturing production has changed over time for the regions shown in Figure 8b.

(2)

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(e) Study Figure 8c in the Resource Booklet.

Assess the impacts associated with the growth of mass tourism.

(6)

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(f) Discuss the view that it is possible to manage the impacts of migration in a sustainable way.

Use Figures 8a, 8b and 8c from the Resource Booklet, and your own knowledge and understanding to support your answer.

(12)

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(Total for Question 8 = 35 marks)

If you answer Question 9 put a cross in the box ☐ .

9 Development and human welfare

(a) (i) Identify **one** economic measure used to define development.

(1)

☒	**A** Calories per person per day
☒	**B** Number of televisions per household
☒	**C** Birth rate per 1000 people per year
☒	**D** Average income earned per person

(ii) State **one** social factor used to calculate the Human Development Index (HDI) score for a country.

(1)

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(iii) Define the term 'gross domestic product (GDP)'.

(1)

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(b) Study Figure 9a in the Resource Booklet.

(i) Name **two** countries labelled in Figure 9a with high political corruption.

(2)

1 .....

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(ii) Suggest **two** possible reasons for the pattern shown in Figure 9a.

(4)

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(c) Explain **two** reasons why levels of natural increase vary for countries at different levels of development.

(4)

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(d) Study Figure 9b in the Resource Booklet.

(i) Calculate the percentage increase in HDI for France between 1980 and 2011.

You must show all your workings in the space below.

(2)

.....%

(ii) Identify the extent to which the HDI score has changed over time for the countries shown in Figure 9b.

(2)

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(e) Study Figure 9c in the Resource Booklet.

Assess the factors that may have led to the uneven development shown on Figure 9c.

(6)

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(f) Discuss the view that bottom-up development projects can improve the quality of life and level of development in developing and emerging countries.

Use Figures 9a, 9b and 9c from the Resource Booklet, and your own knowledge and understanding to support your answer.

(12)

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(Total for Question 9 = 35 marks)

TOTAL FOR SECTION C = 35 MARKS
TOTAL FOR PAPER = 105 MARKS

Pearson Edexcel International GCSE

Geography

Level 1/2

Paper 2: Human geography

Sample assessment material for first teaching September 2017

Resource Booklet

Paper Reference

4GE1/02

Do not return this Resource Booklet with the question paper.

Turn over ▶

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Pearson

SECTION A

The following resource relates to Question 1.

(Source: © A.P.S. (UK) / Alamy Stock Photo)

Figure 1a

Car manufacturing in the UK

The following resource relates to Question 1.

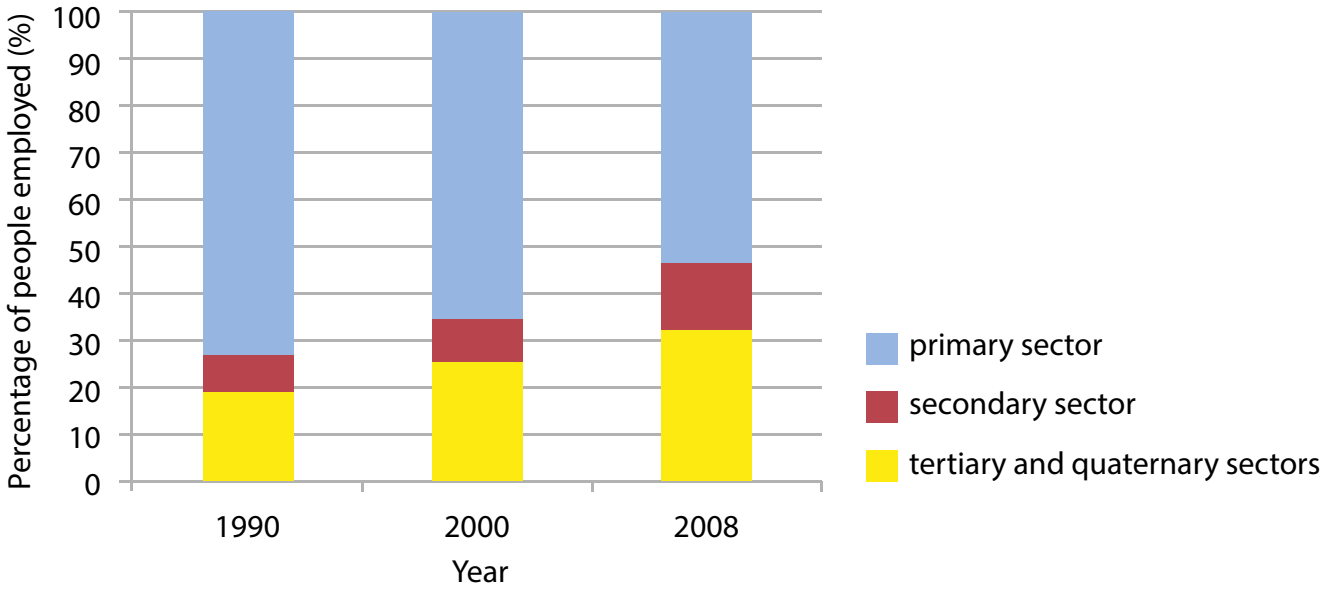


Figure 1b

Changes in employment by economic sector in Vietnam, a developing country, 1990–2008

The following resource relates to Question 1.

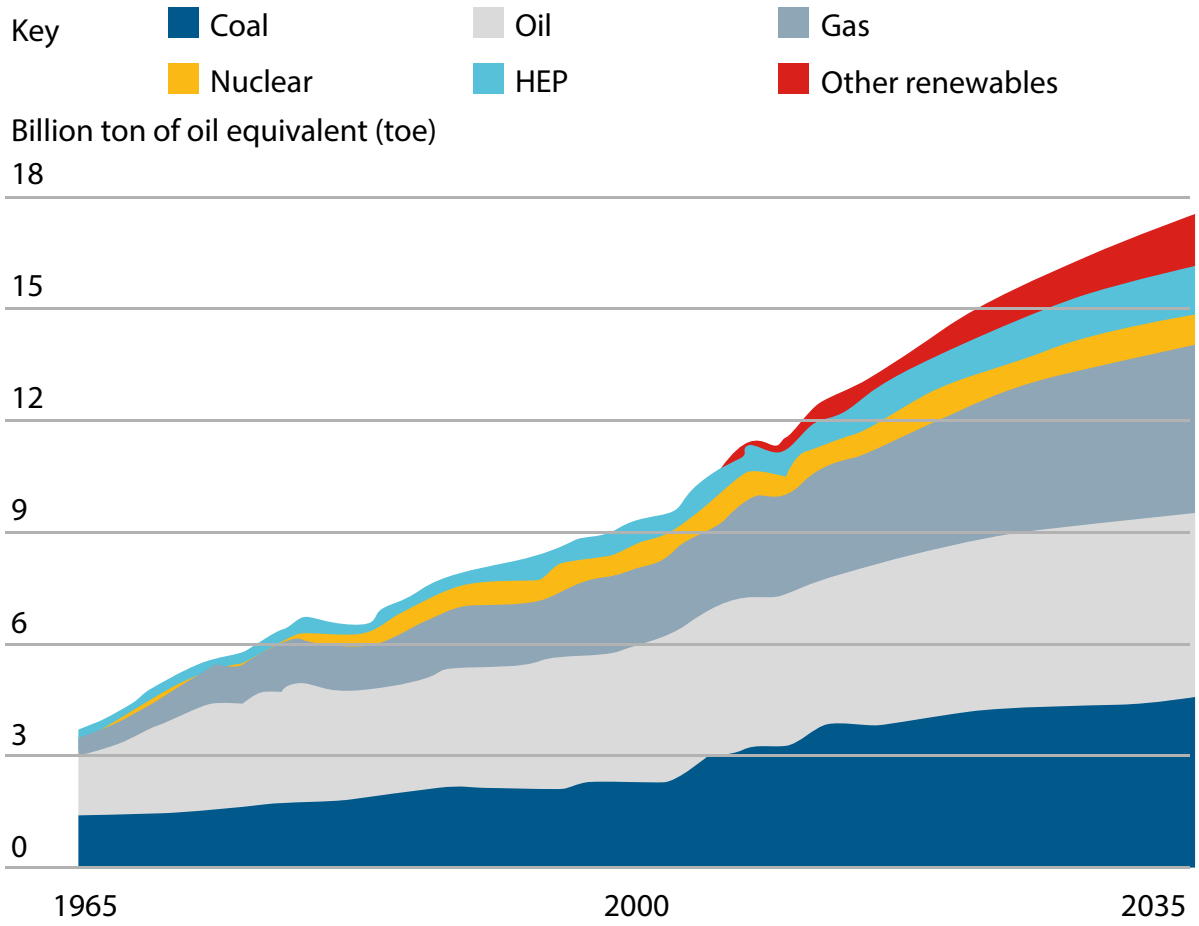


Figure 1c

Past and predicted changes in energy demand, 1965–2035

The following resource relates to Question 2.

Figure 2a

Arable farming in the UK

The following resources relate to Question 2.

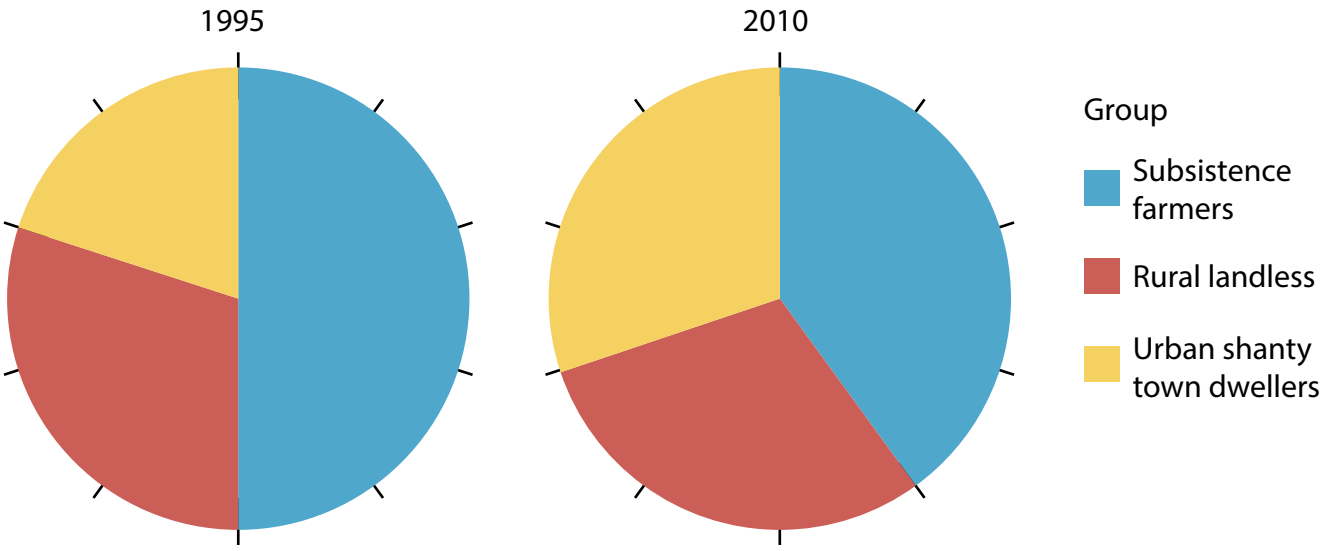


Figure 2b

Proportion of people affected by food shortages in Africa, 1995–2010

The following resources relate to Question 2.

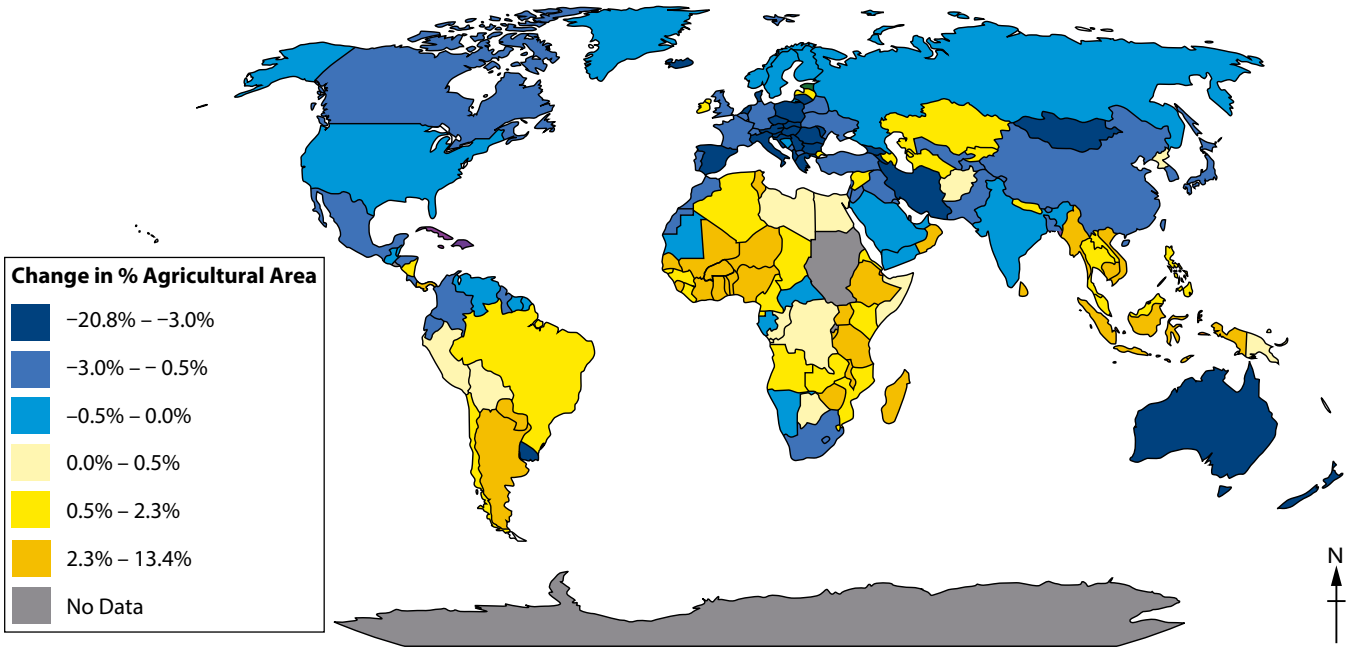


Figure 2c

Change in Agricultural Area 1998–2011 by Country

The following resources relate to Question 3.

Figure 3a

An urban area in Amman, Jordan

The following resources relate to Question 3.

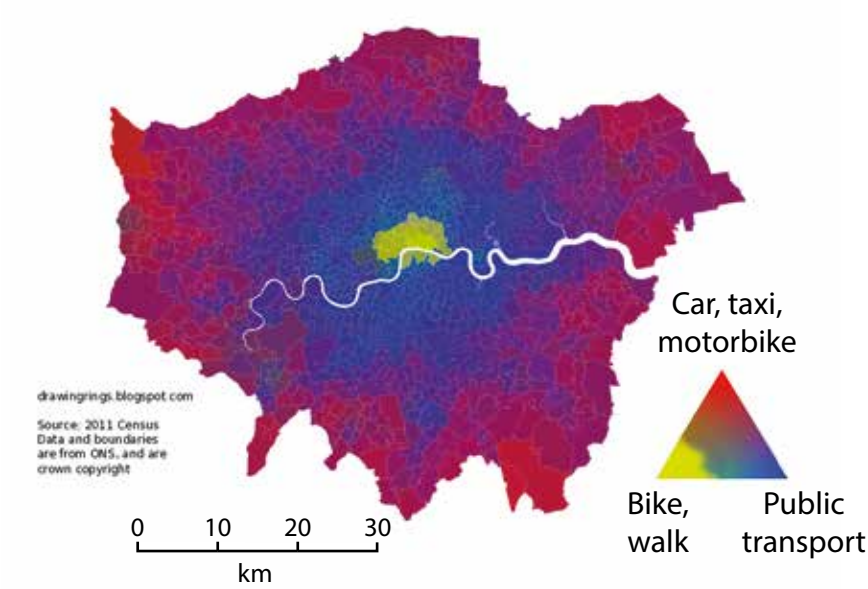


Figure 3b

Data on how people commute in London (based on 2011 census)

The following resources relate to Question 3.

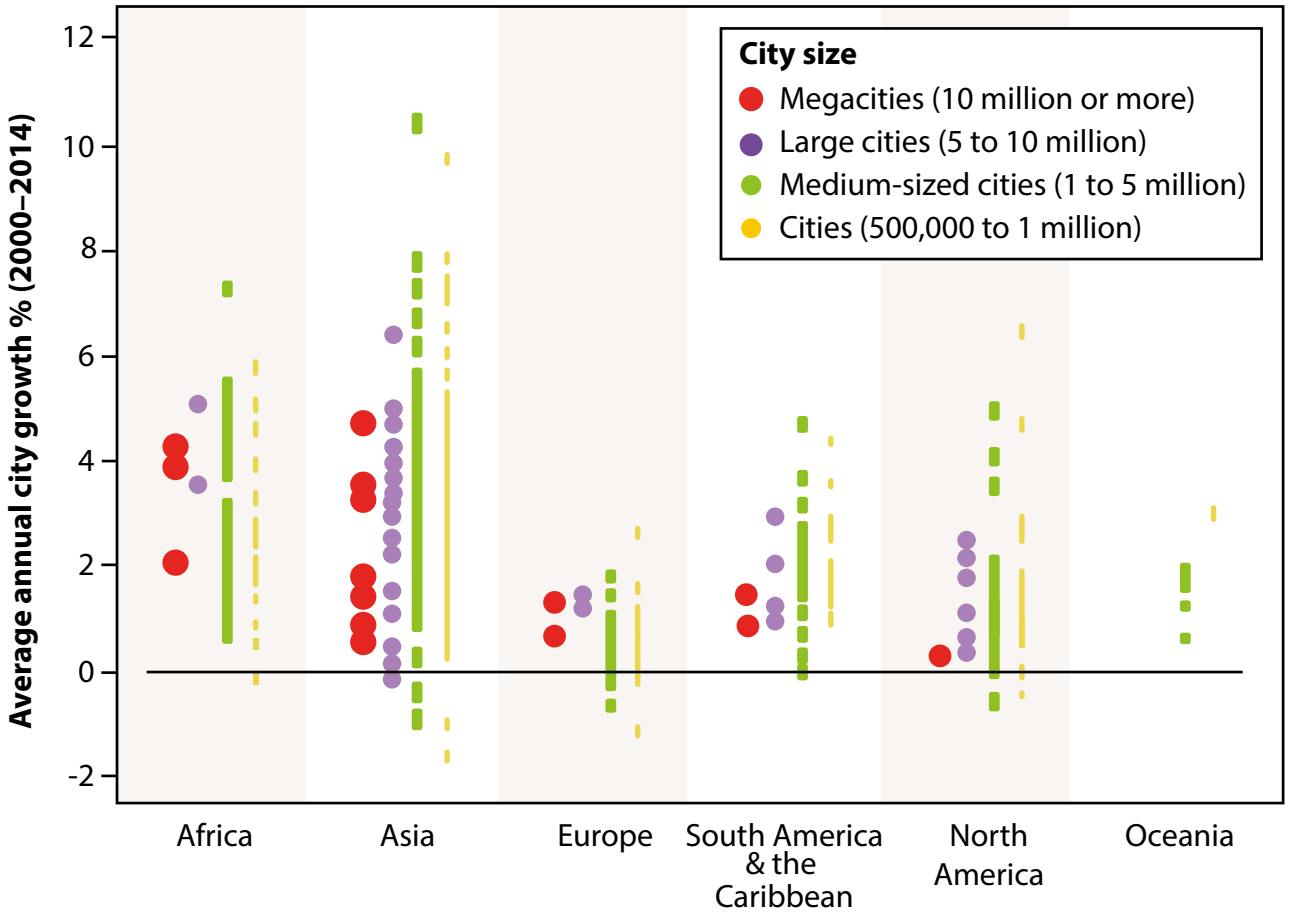


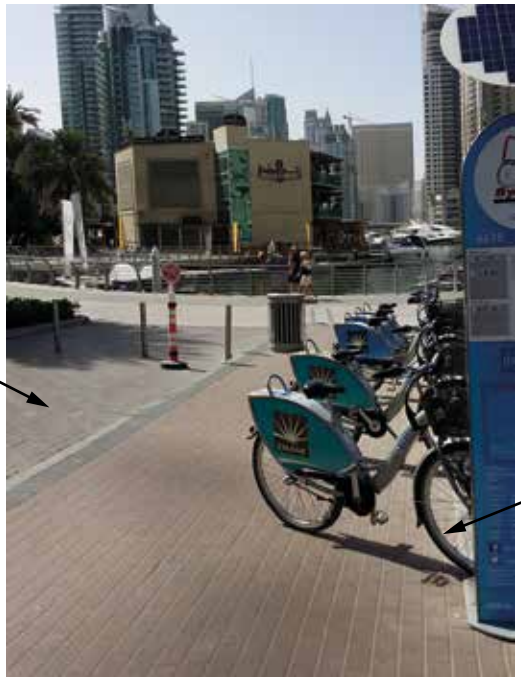
Figure 3c

The world's fastest growing cities

SECTION B

The following resource relates to Question 4.

Enquiry question: To what extent is transport in Dubai being managed in a sustainable way?



Environmental Quality Survey (EQS) – my results

Positive features	**+2**	**+1**	**0**	**–1**	**–2**	**Negative features**
Low traffic count	✓					High traffic count
Traffic mainly bicycles	✓					Traffic mainly cars and lorries
Quiet		✓				Noisy
Odourless		✓				Unpleasant smells
Little/no air pollution		✓				Considerable air pollution
Safe for pedestrians	✓					Dangerous for pedestrians

Figure 4

The following resource relates to Question 5.

Enquiry question: To what extent is the rural environment in Andhra Pradesh, India, changing in a sustainable way?

Wind farm generates electricity supply to local villages

Manufacturing bricks is still labour-intensive as locals cannot afford new technology or machinery

Environmental Quality Survey (EQS) – my results

Positive features	+2	+1	0	-1	-2	Negative features
New energy resources are renewable	✓					New energy resources are non-renewable
Accessible, clean water supply			✓			Limited or polluted water supply
No soil erosion				✓		Considerable soil erosion
Little/no air pollution		✓				Considerable air pollution
Large variety of plants and animals				✓		Very little variety of plants and animals
Reliable electricity supply		✓				No electricity supply

Figure 5

The following resource relates to Question 6.

Enquiry question: To what extent is the urban environment in Dublin, Ireland, changing in a sustainable way?

A large number of new and regenerated high-rise buildings, providing extra housing and office space for many people.

This area has been pedestrianised, which provides safe access for people.

Environmental Quality Survey (EQS) – my results

Positive features	**+2**	**+1**	**0**	**-1**	**-2**	**Negative features**
Low traffic count		✓				High traffic count
Quiet		✓				Noisy
Odourless			✓			Unpleasant smells
Little/no air pollution			✓			Considerable air pollution
Safe for pedestrians	✓					Dangerous for pedestrians
Strong evidence of renewable energy use					✓	No evidence of renewable energy use

Figure 6

SECTION C

The following resource relates to Question 7.

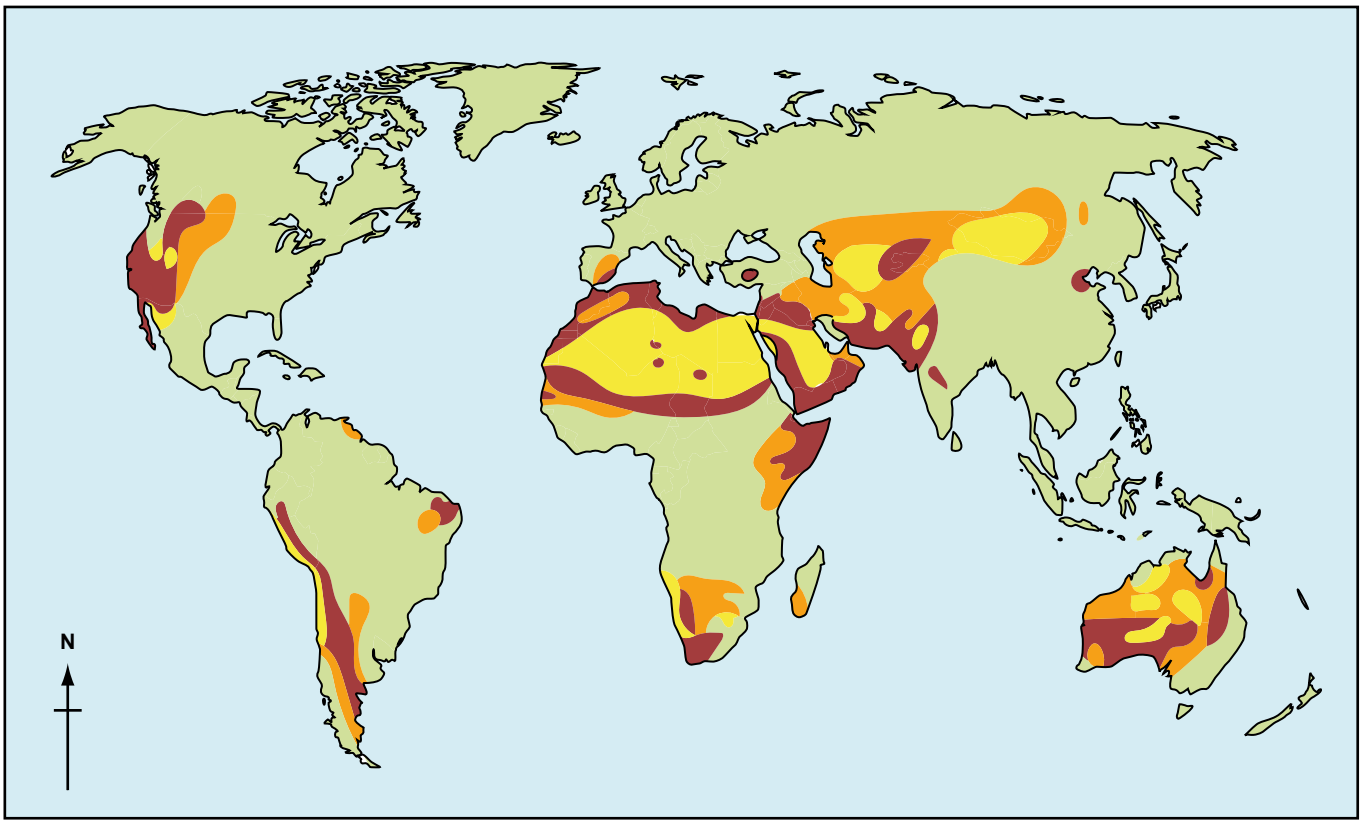


Figure 7a

Global desertification

The following resource relates to Question 7.

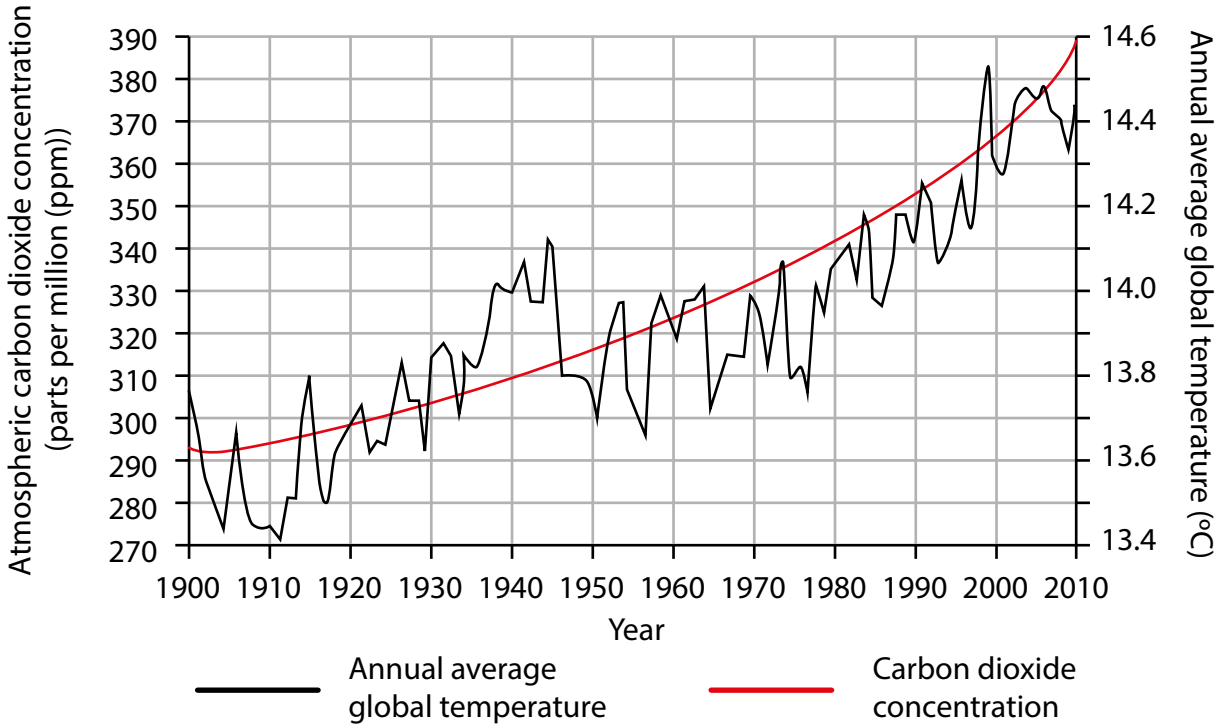


Figure 7b

The variations in annual average global temperatures and atmospheric carbon dioxide concentrations, 1900–2010

The following resource relates to Question 7.

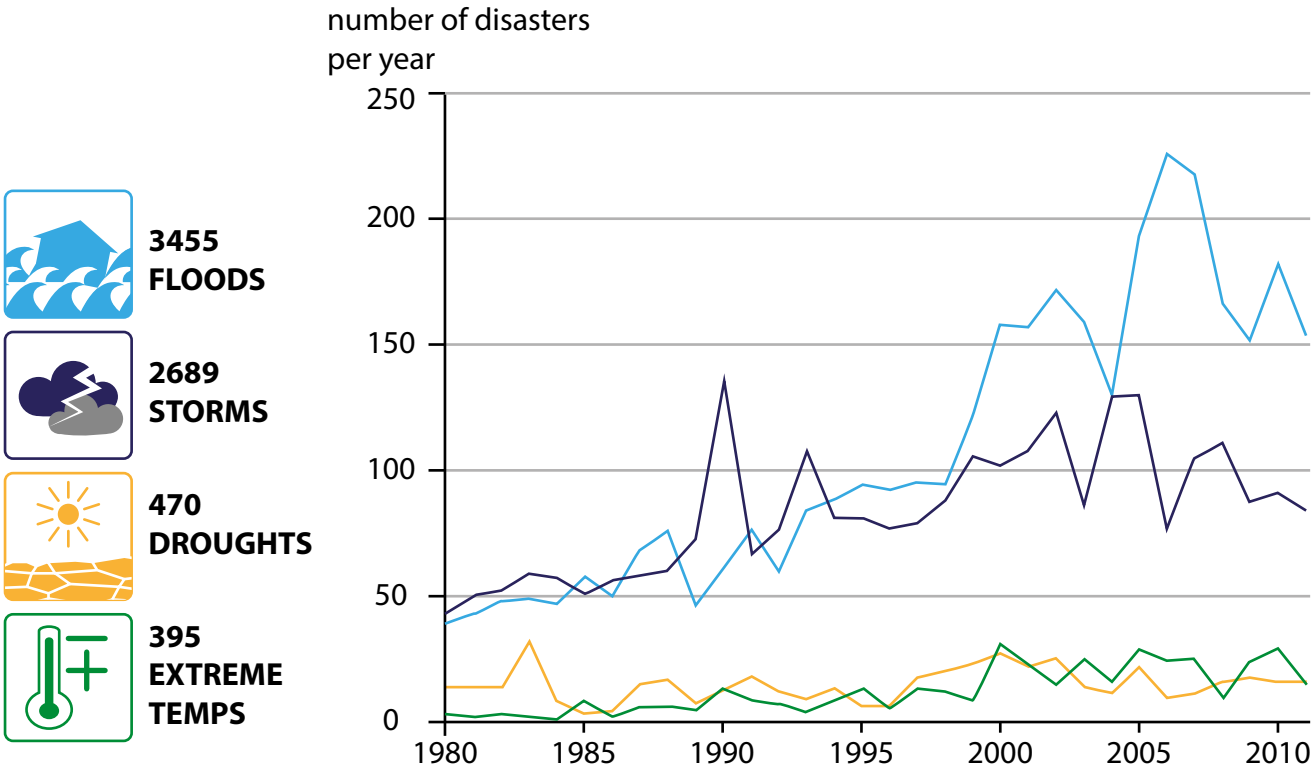


Figure 7c

Number of global climate related disasters between 1980 and 2011

The following resource relates to Question 8.

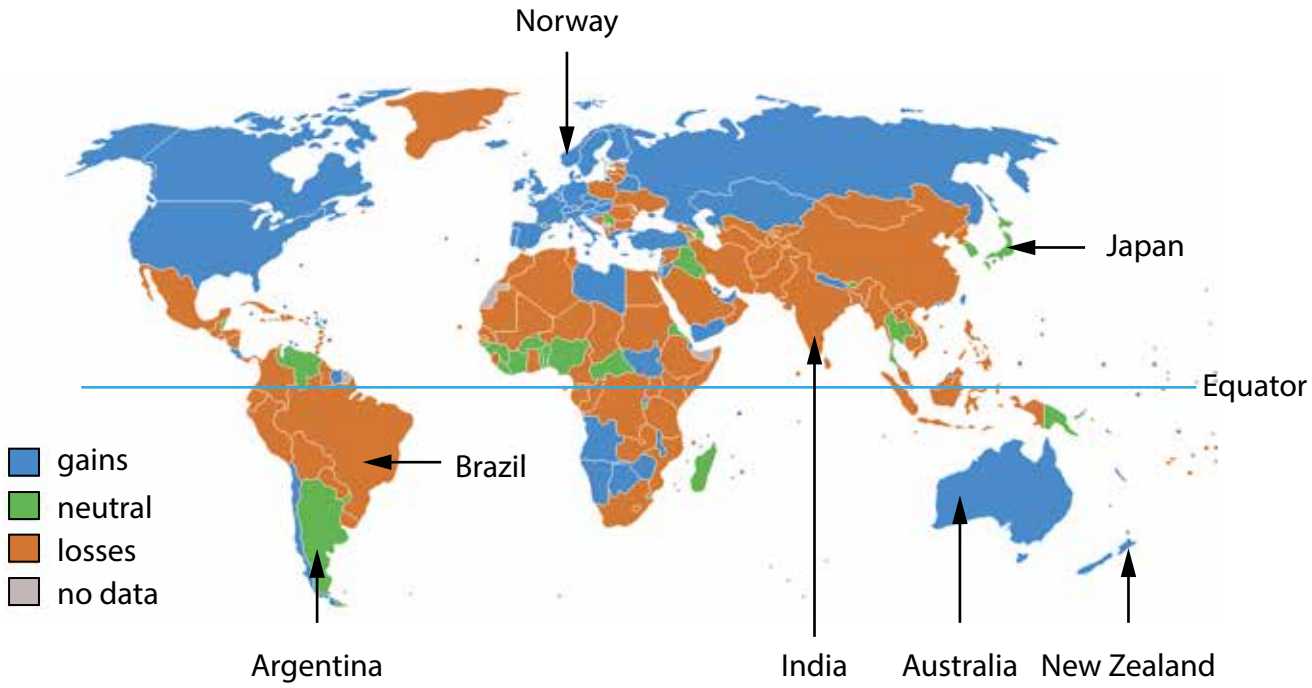


Figure 8a

Global net migration in 2016: gains, losses and neutral

The following resource relates to Question 8.

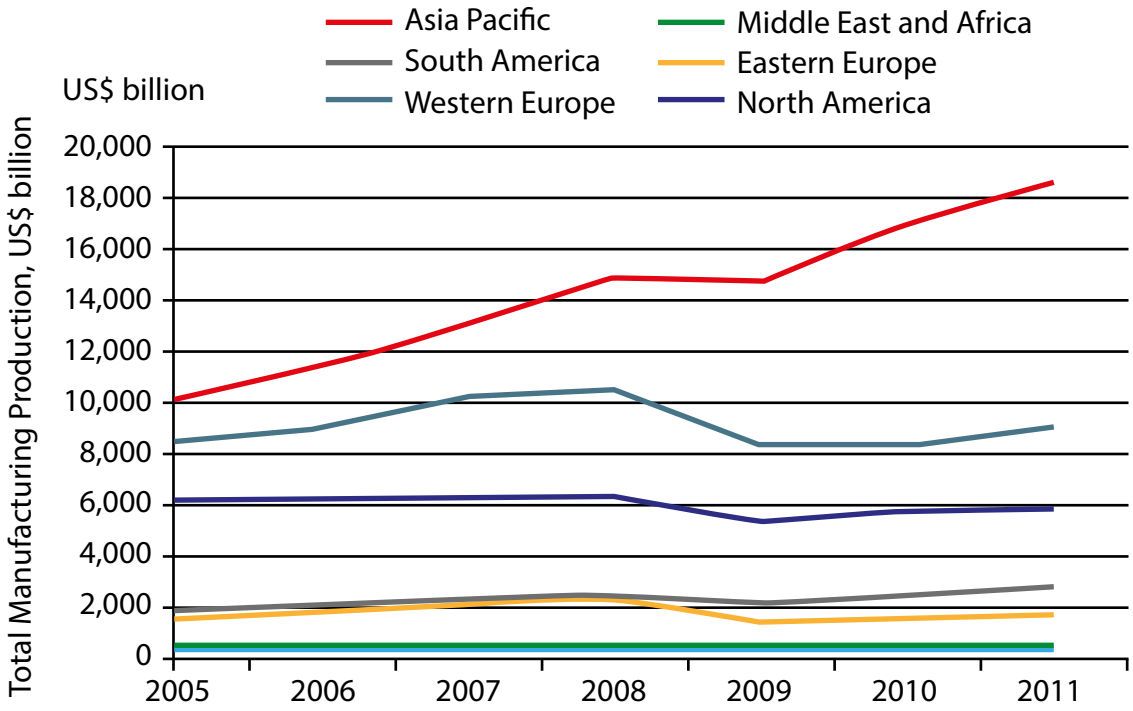


Figure 8b

Manufacturing output ($ billion) for global regions 2005–2011

The following resource relates to Question 8.

Figure 8c

Visitor numbers (millions) to 20 global destination cities, 2015

The following resource relates to Question 9.

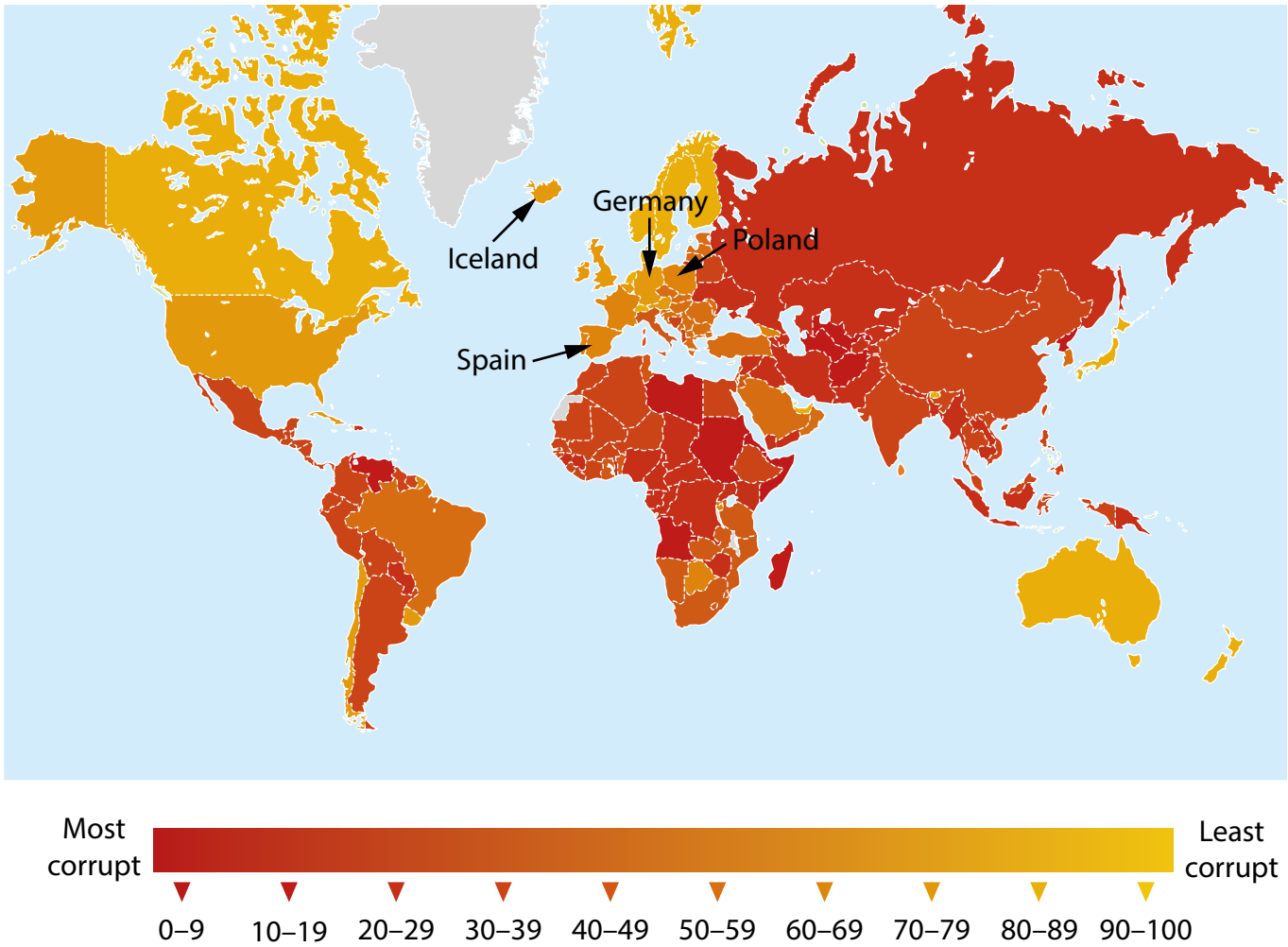


Figure 9a

A global index of political corruption

The following resource relates to Question 9.

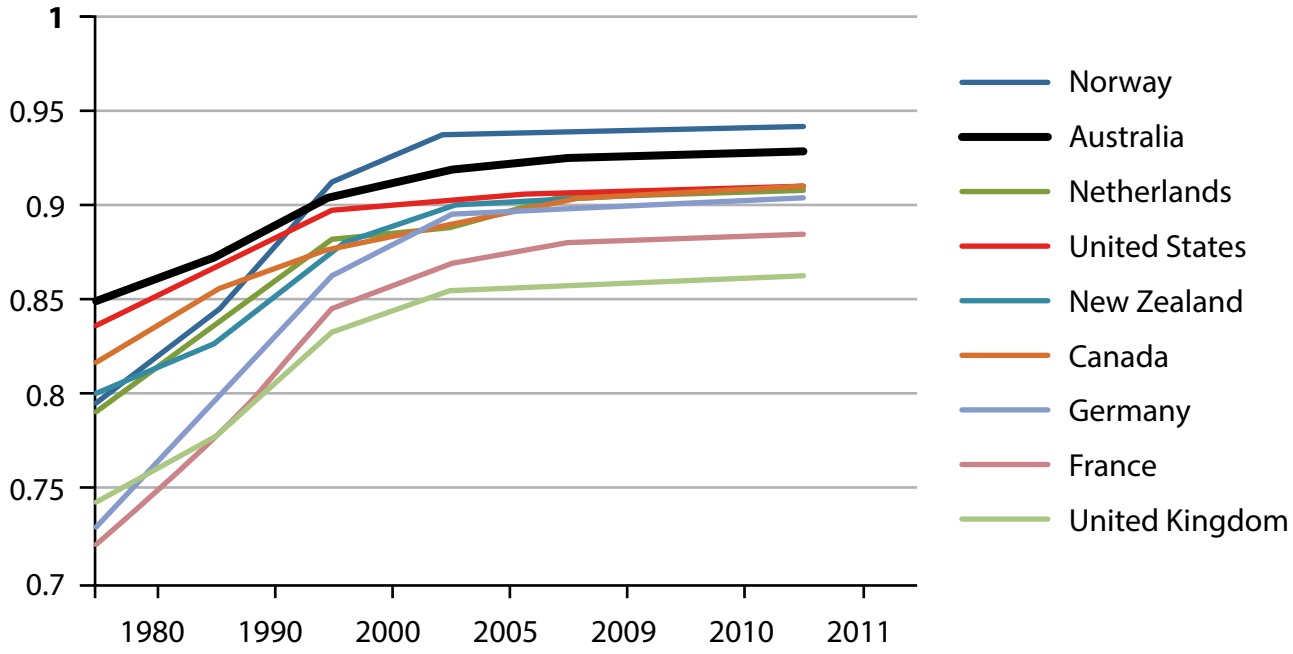
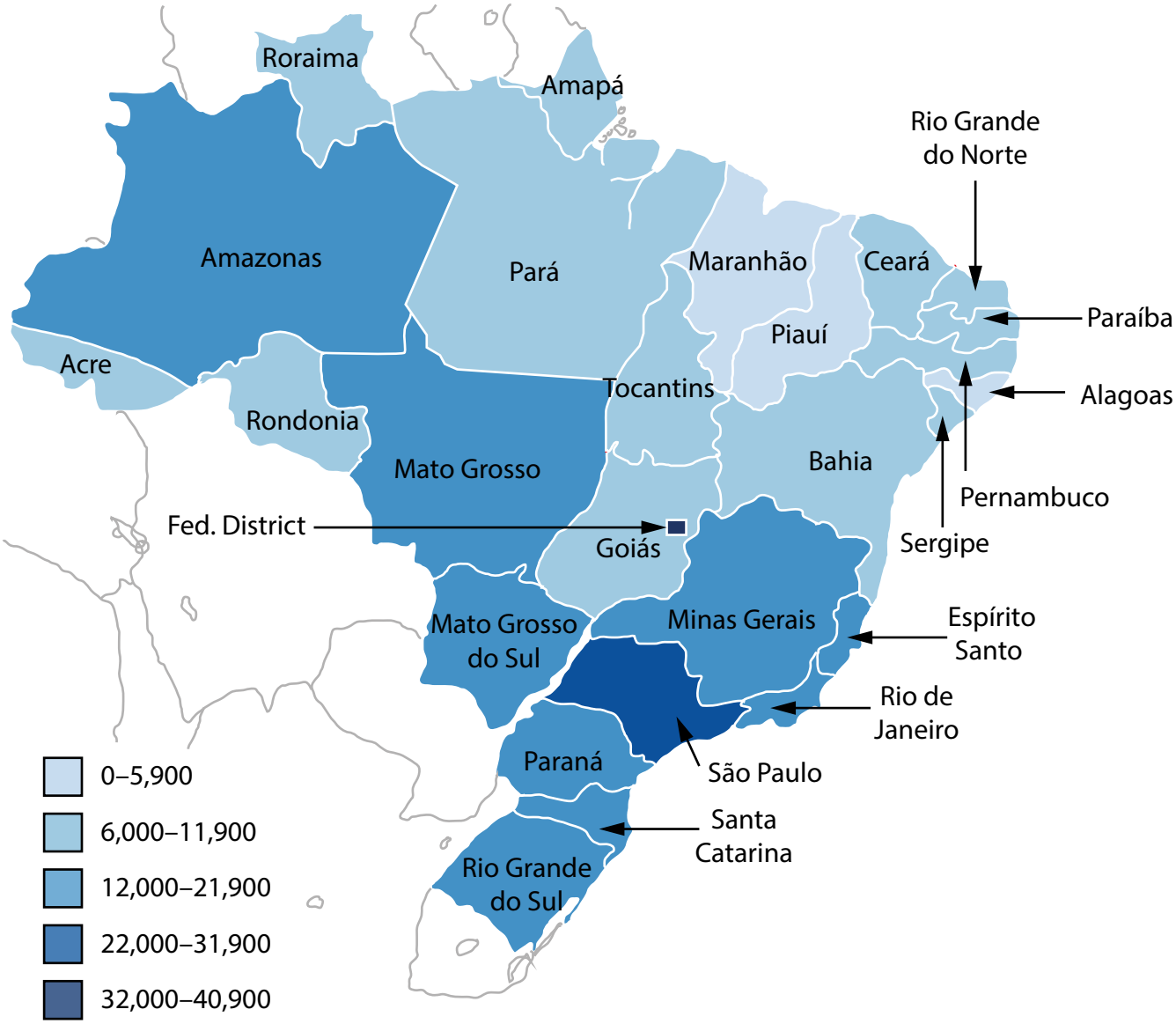


Figure 9b

United Nations HDI (Human Development Index) for selected countries, 1980–2011

The following resource relates to Question 9.



(Source: adapted from Brazil Institute of Geography and Statistics)

Figure 9c

Variations in GDP per capita in Brazil – Figures in Brazilian Reais

Paper 2: Human geography mark scheme

Question number	Answer	Mark
1(a)(i)	**AO1 (1 mark)** A Hydroelectric power	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** • A renewable energy source can be used repeatedly/replaced naturally/is infinite/never runs out (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** C Quaternary	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark)/AO3 (1 mark)** Award 1 mark for a basic locational factor evident from the photograph (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Flat land (1), which is easy to build the factory on (1). • Near to housing (estates) (1) for workers/customers (1). • Near (main) road (1) for access/providing good transport links (1). • Large area (of open space) (1) for further expansion (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)(i)	**AO1 (1 mark)** Award 1 mark for any of the following. • Forestry (1) • Farming (1) • Fishing (1) • Mining (1) • Quarrying (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(d)(ii)	**AO2 (2 + 2 marks)** Award 1 mark for a point about why there has been a decline in the primary sector and a further 1 mark for a development of this point, up to maximum of 2 marks per explanation. • A depletion of raw materials (1) due to increased demand as countries become more industrialised (1). • Increased mechanisation so fewer workers are needed (1) due to advances in agricultural/harvesting technology (1). • It is cheaper to import raw materials (1) because they are less accessible in the home country (1). • Ideas linked to social change, e.g. perception that coal mining is dangerous/dirty/low-paid (1), with further detail or explanation (1). • The rise in numbers employed in the tertiary sector (1) due to perceptions of higher pay/safer working environments (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(e)	**AO2 (2 marks)/AO3 (1 mark)** Award 1 mark (AO3) for a basic reason for an increase in the tertiary and quaternary sectors and a further 2 marks (AO2) for extension through explanation or description, up to a maximum of 3 marks. • The rise in levels of disposable incomes (1) due to people receiving higher wages/paid holidays (1), which has increased the demand for leisure services (1). • Advances in technology have created a whole new range of products (1), which has stimulated the growth of new jobs in this industry (1), such as software designers/ICT technicians (1). • The growth in the tertiary/quaternary sector is partially the result of a fall in the primary and secondary sectors (1) as people are developing different skills/receiving a better education (1) and they are attracted by better paid jobs in the tertiary sector (1). • People are spending more money on services (1) because they have more leisure time/disposable income (1) as they are generally marrying later nowadays (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(f)	**AO2 (4 marks)** Award 1 mark for initial explanation of a sustainable management response and an additional 1 mark for development through further explanation or exemplification. Maximum of 2 marks when no named developed country is used in context. Different countries and examples could be chosen, based on either increasing production, switching to using 'greener' approaches, or reducing demand, e.g. with policies and incentives. • In the UK, the government has been working with EDF to encourage more nuclear power stations, e.g. Hinkley Point (Somerset) (1). This risky project will, however, reduce the country's total carbon emissions, therefore creating greener electricity (1). • Canada and the USA have become much more energy self-sufficient through the use of government policies to encourage HEP (1). This is a cleaner technology that doesn't rely on harmful fossil fuel combustion (1). • In Spain, the government has recently encouraged all new buildings to have better insulation for hot summer temperatures (1), therefore reducing electricity demand for electric A/C in the summer (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1(g)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Different fuel types have become more important as attitudes and policies have changed since 1965, both locally and regionally, as well as internationally. • In the future, coal, gas and oil will still dominate (all fossil fuels) but renewables and hydro will become more significant. Changes in affordability and the price of technology may be responsible for this. • Nuclear energy in 2035 will have the least use, as power stations are so expensive and alternatives will be cheaper. There will also be variations in the reliance on other sources. • The changes in demand will match the development and globalisation of countries, with increasingly wealthy economies/societies needing more power and fuel for transport. • Gas shows the biggest relative increase to its starting point as it is a cleaner source of energy and can be easily transported in bulk, e.g. Liquefied natural gas (LNG). • Concerns about health and risk from nuclear accidents may mean nuclear power has a reduced significance in the future. **AO4** • Figure 1c shows an increase in renewables in the period 2000–2035, meaning that governments will have to encourage more development of alternative technologies. • Figure 1c shows that coal consumption continues to be dominant and actually increases rapidly to around 5 billion toe by 2035. This will lead to more pressure from some agencies and groups to reduce greenhouse gases, especially in rapidly developing economies, such as India and China, where coal is a cheap source of fuel. • In Figure 1c, it can be seen that hydro and nuclear energy use has remained constant from the 1980s, but that gas has risen considerably due to the ease of global transport and fears over CO_2 emissions from fossil fuels. • Oil remains constant and dominant throughout the 1965–2035 period, peaking at around 4 to 5 billion toe. Oil is important as an energy source for Small Island Developing States (SIDS) and for use in transport. • Overall, there is a substantial total increase in energy demand from all sources.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
2(a)	**AO1 (1 mark)** C Population movement from urban to rural areas	**(1)**

Question number	Answer	Mark
2(b)	**AO1 (1 mark)** Award 1 mark for any of the following. • The growing of high-yield crops (in large fields) (1). • The use of fertilisers and/or pesticides to remove weeds/pests or to maximise yields (1). • Keeping livestock indoors to maximise food production (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
2(c)	**(AO1) 1 mark** B Climate regulation	**(1)**

Question number	Answer	Mark
2(d)	**AO2 (1 mark)/AO3 (1 mark)** Award 1 mark (AO2) for suggesting one reason and a further 1 mark (AO3) for an appropriate extension, up to a maximum of 2 marks. • Flat land (1), which means that it is easy to operate machinery/use machinery to harvest crops (1). • Fertile soil (1), which means that the farmer will be able to grow crops (1). • Suitable climate/levels of rainfall/temperature (1), which means that there will be a sufficiently long growing season for crops (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
2(e)	**AO1 (1 mark)** Award 1 mark for any of the following. • Changing the type of crop grown, e.g. a move towards GM crops or organic farming (1). • Changing the method of farming, e.g. move away from nomadic to sedentary (1). • Extreme activities, e.g. zip wire, paintballing (1). • Farm shop/cafe/tea room (1). • Family/petting farm (1). • Camping/caravanning (1). • Livery/cattery/kennels (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
2(f)	**AO2 (2 + 2 marks)** Award 1 mark for a basic negative impact of tourism and a further 1 mark for a development of this point, up to maximum of 2 marks per explanation. • Demand for new hotels in sensitive ecosystems (1) often results in habitat degradation (1). • Footpath erosion (1) due to large volumes of walkers trampling on vegetation (1). • Littering has increased (1), creating visual pollution (1). • Traffic congestion (1) as some country roads are not made to withstand large volumes of traffic (1). • Conflict between tourists and local residents (1) as the tourist might be parking on pavements/creating noise pollution (1). • Increased levels of air pollution (1) due to the increased volume of vehicles coming into the area (1). • Price increases in local shops (1) as shopkeepers take advantage of tourists willing to pay more for goods (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
2(g)	**AO2 (2 marks)/AO3 (1 mark)** Award 1 mark (AO3) for a basic reason for the reduction in food shortages facing subsistence farmers and a further 2 marks (AO2) for extension through explanation or description, up to a maximum of 3 marks. • Subsistence farmers may have been assisted by government projects to improve crops/farming techniques (1), e.g. they may have been given grants to buy artificial fertilisers/pesticides (1), which would increase the productivity of their land (1). • The size of families of subsistence farmers may have decreased in size (1) as a result of people being better educated and having higher aspirations (1). This means that there are now less mouths to feed and so food supplies go further (1). • Rural to urban migration has increased (1) as a result of push or pull factors (1). This may have increased the overall proportion of people facing food shortages in urban areas (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
2(h)	**AO2 (2+2 marks)** Award 1 mark for initial explanation of a local and/or national government scheme/response, and an additional 1 mark for development through further explanation or exemplification. Maximum of 2 marks when no named developing or emerging country is used in context. Answers will depend on chosen case studies, but expect the following points to arise. • In many locations where there are foreign visitors, ecotourism has been promoted by governments (1). This improves the quality of life for locals, with better employment opportunities, and helps the money generated to stay in the local community (1). • In many poorer rural areas of countries, such as Kenya, governments have supported the introduction of commercial farming (1). They have achieved this through special loans and financing schemes so that local people can afford new land and have access to more money and appropriate technology (1). • Fair trade means that the producer receives a guaranteed and fair price for their product regardless of the price on the world market (1). This has been used in Bangladesh, for example. This means the quality of life for fair trade producers should improve, as well as the long-term prospects for their children (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
2(i)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Some areas in the world are experiencing a rapid growth in their population, largely due to a high rate of natural increase. This puts pressure on the food supply and may prompt stakeholders to increase the amount of agricultural land area to ensure that supply meets demand. • Some areas of the world may have experienced an increase in wars, natural hazards and/or diseases in recent years, such as AIDS and other epidemics, which raise the death rate. This means that there are fewer older people to work in the fields to produce food and, therefore, the land area used for agriculture could be reduced. • Environmental degradation may have increased in some areas, which reduces the amount of available land for agriculture. As people seek to produce food and earn income from the land, more vulnerable land is used. The processes of desertification and deforestation mean that the environment degrades so that it is no longer suitable for agriculture. • Increase in globalisation/tourism in some rural environments brings money into the area and may help improve local infrastructure, which may allow previously unused land to be used for agricultural purposes. • Increased deforestation in some parts of the world have increased the amount of land available for farming. • As an area becomes more developed, the use, availability and affordability of technology, e.g. machinery, genetically-modified (GM) crops, fertilisers, irrigation systems, herbicides and pesticides, increases and so does the amount of land that can be used for agriculture. • Possible impacts of climate change, e.g. temperature/rainfall, may increase or decrease the land area in a region that is used for agriculture.

	AO4 • In general, there is a broad split between areas with a decrease in agricultural area in developed countries and an increase in agricultural area in developing/emerging countries. • The continents of Africa and South America have the largest areas that have seen an increase in agricultural land. However, there are some countries, e.g. South Africa/Namibia in Africa and Colombia/Ecuador in South America, which have had a decrease in agricultural land area. • The majority of North America and Europe have seen a decrease in agricultural land area. However, there are some small pockets in these continents, e.g. the Republic of Ireland, where there has actually been an increase in agricultural land area. • Several countries in South America, e.g. Bolivia/Peru, Africa, e.g. Botswana/Egypt, and Asia, e.g. North Korea/Afghanistan, have had little change in the amount of land used for agriculture.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
3(a)	**AO1 (1 mark)** A Population growth on the edge of urban areas	**(1)**

Question number	Answer	Mark
3(b)	**AO1 (1 mark)** • An increase in the proportion of people living in urban areas compared to rural areas, or similar (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
3(c)	**AO1 (1 mark)** C A site that has previously been built on	**(1)**

Question number	Answer	Mark
3(d)	**AO2 (1 mark)/AO3 (1 mark)** Award 1 mark (AO3) for one piece of evidence and a further 1 mark (AO2) for an appropriate extension, up to a maximum of 2 marks. • The housing in the picture is very high density (1), which is typical of city areas where land values are high (1). • The image shows multiple-storey houses (1), which are likely to house large numbers of people (1). • There is little green space (1), indicating the built-up nature of the area since land values are so high (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
3(e)(i)	**AO1 (1 mark)** Megacities have populations of over 10 million. Globally there are 35 of these megacities (2015). Award 1 mark for any of the following. Examples include: • London (1) • Tokyo (1) • Mumbai (1) • New York (1) • Jakarta (1) • São Paulo (1). The full list available here: en.wikipedia.org/wiki/Megacity Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
3(e)(ii)	**AO2 (2 + 2 marks)** Award 1 mark for a basic factor that has led to the growth of megacities and a further 1 mark for a development of this point, up to maximum of 2 marks per explanation. • Natural increase is high (1) as birth rates are higher than death rates (1). • High birth/increasing birth rate (1), with stated reason (1). • With fewer people dying, death rates are falling (1), with stated reason (1). • Rural to urban migration (1), with extension through details of a push or pull factor (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
3(f)	**AO2 (2 marks)/AO3 (1 mark)** Award 1 mark (AO3) for a basic reason for the differences in commuting patterns and a further 2 marks (AO2) for extension through explanation or description, up to a maximum of 3 marks. • In the outer areas there is a predominance of cars (1) because there may be less road congestion and/or limited public transport options (1). People living in these areas might have a further distance to travel into the centre of London for work (1). • Central London has many people cycling/walking (1) due to potentially higher levels of traffic congestion in the central area (1), which would slow down journey times (1). • Central London has many people cycling/walking (1) as they only need to travel a short distance (1), with the bulk of their journey being completed via public transport (1). • In the middle/inner suburbs, public transport is dominant (1). This might be because people need the connectivity of public transport (1) as it still would be too far to walk/cycle into the centre of London (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
3(g)	**AO2 (2 + 2 marks)** Award 1 mark for initial explanation of a scheme, and an additional 1 mark for development through further explanation or exemplification. Maximum of 2 marks when no named developed country is used in context. Answers will depend on chosen case studies, but expect the following points to arise. • A named policy/strategy used by national and/or local government (1) details how this reduces household and/or municipal waste (1). • Introduction of schemes to 'reduce, reuse and recycle' (1), with further explanation of how this will reduce waste/why this strategy is better than other options, e.g. landfill or incineration (1). • Equipping residents with facilities to recycle and compost their own waste (1), e.g. through doorstep recycling schemes, bottle banks and household waste recycling centres (1). • Development of waste-burning, as opposed to power stations burning fossil fuels (1), will reduce the amount of waste that is disposed of via landfill (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
3(h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Social and economic challenges are likely to be greatest in developing nations because of a combination of factors. They have fewer resources to cope with more people and their rates of urbanisation are much greater than that of their developed counterparts. • Much of the rapid growth in cities in developing and emerging countries has been caused by rural-urban migration, leading to the creation of shanty towns and squatter settlements. Because of the unplanned nature and scale, this is one of the biggest problems. • Rapid urbanisation creates traffic congestion and transport challenges in a range of developed, developing and emerging countries. This is a problem for various groups in society, rich and poor alike. Solutions are very expensive in nearly all cases, so this is also a big problem. • Lack of access to quality health provision affects developing and emerging countries more. This is linked to mushrooming cities where there is the problem of access to clean water, enabling disease to spread rapidly. • There are other challenges, such as low levels of employment or employment in the informal sector, which is unregulated and poorly paid. This economic challenge can be difficult to solve without clear government intervention. **AO4** • From 2000–2014, the majority of cities in each region have experienced growth, although this growth has been uneven. For example, in Oceania and Europe there has been much smaller growth when compared to Africa and Asia. • Asia has seen the largest increase in cities, both in terms of the number of cities on the continent and the amount by which these cities have grown, with many growing by more than 6%. • Cities in developed countries tend to grow more slowly (0–4%) compared to cities in developing/emerging countries (many by 4–8%). • Europe has the most cities that experienced a decrease in size (usually 0–1%) between 2000 and 2014. • Oceania has the fewest number of cities with a population between 1–5 million (and no megacities). These cities appear to be growing relatively slowly, with only 0–2% change between 2000 and 2014.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
4(a)	**AO4 (2 marks)** Sampling strategy: random, systematic or stratified. NB There are no marks for stating the strategy. • Stratified – used to allow fair data collection (1) as the population of the interview sample was mixed in terms of age (1). • Systematic – adopted as the most practical approach in order to collect a large number of questionnaire responses (1), not knowing anything about the underlying population (1). • Random – chosen as the expectation was that the land use would be similar in all areas where the interviews were carried out (1), therefore creating an equal chance of reaching a particular type of person (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO4 (3 marks)** Award 1 mark for initial, clear type of a specific data and an additional 2 marks for development through further description or exemplification. The secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: developing energy resources. • 2015 geodemographic Index of multiple deprivation (IMD) data was used (1) to find out about the spatial variation in the city (1). This allowed the groups to design an appropriate sampling frame that helped to further understand the area from the fieldwork data (1). • A 2015 city future report from the regional government (accessed online) (1) allowed access to information about how the city was changing its transport policy to encourage more sustainability (1). This understanding helped in forming the questions included in the questionnaire (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(c)	**AO3 (2 + 2 marks)** NB There is no credit for stating type of graph or diagram. Award 1 mark for the identification of a reason and a further mark for an explanation of the reason, up to a maximum of 2 marks. There are two reasons required in this question. • A gain-loss graph was used because this showed both the positives and negatives in people's attitudes (1) and made comparisons between the questions much easier to see (1). • A located proportional bar was used for some questions so that changes along the road could be seen (1), as well as the places/sites where most change happened in terms of the development of different attitudes (1). Reward candidates who give reasons for use of maps/ geographic information system (GIS)/photos. Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
4(d)	**AO3 (3 marks)** Award 1 mark for the identification of a reason and a further mark(s) for an explanation of the reason, up to a maximum of 3 marks. • The approach by the individual to collect the data may vary (1), leading to different results when measuring the same data/information (1), making results (conclusions) unreliable (1). • All the variables affecting the data/information being measured are not considered (1), so the results measured have been affected in different ways (1), making results (conclusions) unreliable (1). • An Environmental quality survey (EQS) was designed with open descriptors and questions (1), which led to ambiguous responses (1) and, therefore, unreliable results (conclusions) (1). Accept any other appropriate response.	**(3)**

Question number	Indicative content
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • The sampling strategy, e.g. random, stratified and/or systematic, is important when planning data collection for an investigation. For example, if something is either under- or over-represented, results, despite being accurately collected, might not provide valid conclusions. • Recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites (spatial) and the time of year (temporal). • Reliability and accuracy of the student's methods may be evaluated with reference to potential evaluation, including equipment errors and operator errors. • Judgement about limitations of equipment used/operator error in relation to the enquiry question. • An evaluation of how far the student's results can be trusted may be provided (or repeated to obtain the same results – reliability). **AO4** • The student only carried out a data collection (EQS and annotated digital photograph) at one location in Dubai, therefore variations across the city will not have been measured. The student could have repeated the method at 500 m intervals (systematic sampling) along a transect across the city for a more accurate result that would have possibly identified spatial variations/changes. • The location of the annotated digital photograph is unknown and may be in an area of the city where transport pressures are low. This means that the results may not be representative of the city as a whole and greater sampling is required to obtain valid conclusions. • The EQS does include a broad range of criteria that have been used to assess the location. However, the +2 score for 'safe for pedestrians' could have been explored further, e.g. with a land use map, for more meaningful results.

	• The completion of the EQS, and the overall positive +10 rating arrived at by the student, may be accurate and reliably carried out at different locations across the city, but it is subjective to the individual. An approach that may produce results leading to a more valid conclusion would be to ask a group of students to each carry out their own EQS and average the results, or to ask a group of students to discuss and agree on the scores for each criterion.	
Level	**Mark**	**Descriptor**
	0	No acceptable response.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
5(a)	**AO4 (2 marks)** Sampling strategy: random, systematic or stratified. NB There are no marks for stating the strategy. • Stratified – used to allow fair data collection (1) as the population of the interview sample was mixed in terms of age (1). • Systematic – adopted as the most practical approach in order to collect a large number of questionnaire responses (1), not knowing anything about the underlying population. • Random – chosen as the expectation was that the population would be similar in all areas where the interviews were carried out (1), therefore creating an equal chance of reaching a particular type of person (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
5(b)	**AO4 (3 marks)** Award 1 mark for initial clear type of a specific data and an additional 2 marks for development through further description or exemplification. The secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: rural change. • 2015 geodemographic IMD data was used (1) to find out about the spatial variation of the local villages/ areas (1). This allowed the groups to design an appropriate sampling frame that helped to further understand the area from the fieldwork data (1). • A 2015 rural transport strategy document from the government (accessed online) (1) allowed access to information about how the region was changing its transport policy towards a more sustainable framework (1). This understanding helped in forming the questions included in the questionnaire (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
5(c)	**AO3 (2 + 2 marks)** NB There is no credit for stating the type of graph or diagram. Award 1 mark for the identification of a reason and a further mark for an explanation of the reason, up to a maximum of 2 marks. There are two reasons required in this question. • A gain-loss graph was used because this showed the positives and negatives in people's attitudes (1) and made comparisons between the questions much easier to see (1). • A located proportional bar was used for some questions so that changes along the road could be seen (1), as well as the places/sites where most change happened in terms of the development of different attitudes (1). Reward candidates who give reasons for use of maps/GIS/photos. Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
5(d)	**AO3 (3 marks)** Award 1 mark for the identification of a reason and a further mark(s) for an explanation of the reason, up to a maximum of 3 marks. • The quality of sampling procedure, i.e. the number of sites (1) would have impacted on the results, and the fact that there was lots of variability in people's responses at any one site (1) could have caused inaccuracies (1). • The quality of recording sheet used and potential for errors to be introduced (1) due to poor questionnaire design, e.g. sequencing of questions (1), which could have caused inaccurate findings (1). Accept any other appropriate response.	**(3)**

Question number	Indicative content
5(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • The sampling strategy, e.g. random, stratified and/or systematic, is important when planning data collection for an investigation. For example, if something is either under- or over-represented, results, despite being accurately collected, might not provide valid conclusions. • A recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites (spatial) and the time of year (temporal). • The reliability and accuracy of the student's methods may be evaluated with reference to potential evaluation, including equipment errors and operator errors. • A judgement about limitations of equipment used/operator error in relation to the enquiry question. • An evaluation of how far the student's results can be trusted may be provided (or repeated to obtain the same results – reliability). **AO4** • The student only carried out a data collection (EQS and annotated digital photograph) at one location, Andhra Pradesh, therefore variations across the area will not have been measured. The student could have repeated the method at 500 m intervals (systematic sampling) along a transect across the area for a more accurate result that would have possibly identified spatial variations/changes. • The location of the annotated digital photograph is unknown and may be in the only part of the area that shows any sign of renewable energy sources, so the results may not be representative of the area as a whole and greater sampling is required to obtain valid conclusions. • The EQS does include a broad range of criteria that have been used to assess the location. However, the +2 score for 'new energy resources are renewable' could have been explored further, e.g. with a land use map, for more meaningful results. • The completion of the EQS, and the overall +1 rating arrived at by the student, may be accurate and reliably carried out at different locations across the area but it is subjective to the individual. An approach that may produce results leading to a more valid conclusion would be to ask a group of students to each carry out their own EQS and average the results, or to ask a group of students to discuss and agree on the scores for each criteria.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
6(a)	**AO4 (2 marks)** Sampling strategy: random, systematic or stratified. NB There are no marks for stating the strategy. • Stratified – used to allow fair data collection (1) as the population of the interview sample was mixed in terms of age (1). • Systematic – adopted as the most practical approach in order to collect a large number of questionnaire responses (1), not knowing anything about the underlying population. • Random – chosen as the expectation was that the population would be similar in all areas where the interviews were carried out (1), therefore creating an equal chance of reaching a particular type of person (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
6(b)	**AO4 (3 marks)** Award 1 mark for initial clear type of a specific data and an additional 2 marks for development through further description or exemplification. The secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: rural change. • 2015 geodemographic IMD data was used (1) to find out about the spatial variation in urban areas (1). This allowed the groups to design an appropriate sampling frame that helped to further understand the area from the fieldwork data (1). • A 2015 urban transport strategy document from the government (accessed online) (1) allowed access to information about how the region was changing its transport policy towards a more sustainable framework (1). This understanding helped me in forming the questions included in the questionnaire (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
6(c)	**AO3 (2 + 2 marks)** NB There is no credit for stating the type of graph or diagram. Award 1 mark for the identification of a reason and a further 1 mark for an explanation of the reason, up to a maximum of 2 marks. There are two reasons required in this question. • A gain-loss graph was used because this showed the positives and negatives in people's attitudes (1) and made comparisons between the questions much easier to see (1). • A located proportional bar was used for some questions so that changes along the road could be seen (1), as well as the places/sites where most change happened in terms of the development of different attitudes (1). Reward candidates who give reasons for use of maps/GIS/photos. Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
6(d)	**AO3 (3 marks)** Award 1 mark for the identification of a reason and a further mark(s) for an explanation of the reason, up to a maximum of 3 marks. • The quality of sampling procedure, i.e. the number of sites (1) would have impacted on the results and the fact that there was lots of variability in people's responses at any one site (1) could have caused inaccuracies (1). • The quality of recording sheet used and potential for errors to be introduced (1) due to poor questionnaire design, e.g. sequencing of questions (1) could have caused inaccurate findings (1). Accept any other appropriate response.	**(3)**

Question number	Indicative content
6(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • The sampling strategy, e.g. random, stratified and/or systematic, is important when planning data collection for an investigation. For example, if something is either under- or over-represented, results, despite being accurately collected, might not provide valid conclusions. • Recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites (spatial) and the time of year (temporal). • The reliability and accuracy of the student's methods may be evaluated with reference to potential evaluation, including equipment errors and operator errors. • A judgement about limitations of equipment used/operator error in relation to the enquiry question. • An evaluation of how far the student's results can be trusted may be provided (or repeated to obtain the same results – reliability). **AO4** • The student only carried out a data collection (EQS and annotated digital photograph) at one location in Dublin therefore variations across the urban environment will not have been measured. The student could have repeated the method at 500 m intervals (systematic sampling) along a transect across the urban environment for a more accurate result that would have possibly identified spatial variations/changes. • The location of the annotated digital photograph is unknown and may be in the only part of Dublin where there is no evidence of renewable energy use, so the results may not be representative of the area as a whole and greater sampling is required to obtain valid conclusions. • The EQS does include a broad range of criteria that have been used to assess the location. However, the −2 score for 'strong evidence of renewable energy use' could have been explored further, e.g. with a land use map, for more meaningful results. • The completion of the EQS, and the overall positive +4 rating arrived at by the student, may be accurate and reliably carried out at different locations across Dublin, but it is subjective to the individual. An approach that may produce results leading to a more valid conclusion would be to ask a group of students to each carry out their own EQS and average the results, or to ask a group of students to discuss and agree on the scores for each criteria.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
7(a)(i)	**AO1 (1 mark)** D Methane	**(1)**

Question number	Answer	Mark
7(a)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following. • Milankovitch cycles (1). • Solar variation/sunspots (1). • Volcanic eruptions (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
7(b)(i)	**AO1 (1 mark)** • Desertification means the spread of desert-like conditions into nearby areas/the outward expansion of deserts into their surrounding regions (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
7(b)(ii)	**AO3 (2 marks)** Award 1 mark for any of the following, up to a maximum of 2 marks. • USA (1) • Australia (1) • South Africa (1)	**(2)**

Question number	Answer	Mark
7(b)(iii)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark for the identification of a possible reason for the pattern shown on Figure 7a (AO3) and a further mark for an explanation of the reason (AO2), up to a maximum of 2 marks per idea. • A lack of rainfall in named area (1) reduces vegetation cover (1). • Some areas have less vegetation than others (1), which increases the chances of soil erosion happening (1). • Some areas experience intense rainfall/flash floods (1), which increases the rate of run-off/reducing soil moisture (1). • Over-farming in named area(s) (1) reduces soil fertility over time (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
7(c)	**AO1 (2 marks)/AO2 (2 marks)** Award 1 mark (AO1) for the identification of a reason and a further mark (AO2) for an explanation of the reason, up to a maximum of 2 marks per cause. • Trees have been cut down to make room for agriculture (1). This is carried out because the land is initially fertile and can be planted with a valuable cash crop, e.g. palm oil (1). • Land is converted from a primary/natural forest into a commercial timber crop (1). This is because tropical hardwood timber, for example, has a high commercial export value (1). • Growing importance/market of fuelwood in some developing countries (1) has increased the demand for timber/the amount of illegal logging (1). • Population growth (1) has led to many areas of forest being cleared to make room for new housing (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
7(d)(i)	**AO4 (2 marks)** Award 1 mark for a correct answer and 1 mark for working. (new number) 390 – (old number) 293 = increase of 97 (1) (increase of 97) divided by (old number) 293 × 100 = percentage increase of 33% (1) Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
7(d)(ii)	**AO3 (2 marks)** Award 1 mark for the identification of a pattern and 1 mark for further detail through description or use of supporting data from the resource, up to a maximum of 2 marks. • There is an overall positive relationship (1) but in some years, e.g. 1945–50, annual average global temperature falls while carbon dioxide increases (1). • As annual average global temperature goes up, so does carbon dioxide concentration (1), but the increase in global temperature fluctuates a lot more than carbon dioxide concentration (1). Accept any other appropriate response.	**(2)**

Question number	Indicative content
7(e)	**AO3 (3 marks)/AO4 (3 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Soil erosion may increase as a result of climate change, e.g. linked to drying out, wind and droughts. • Soil erosion could be in the form of gully and sheet erosion with more intense precipitation events, which are associated with climate change. • Desertification may increase as productive land becomes degraded by drought, extreme temperatures, unreliable rainfall, further increasing the fragility of the ecosystem. • Rising sea levels may threaten/flood low-lying coastal ecosystems and fragile environments. This is something that could be further exacerbated by more frequent storms/hurricanes due to warmer ocean temperatures. • Increasing risk of fragile environments being affected by flooding as a result of glacial melting, flash floods and baked/impermeable soils. **AO4** • Figure 7c shows an overall increase in all types of climate disasters, apart from drought. • Figure 7c shows that the most significant rises have been in storms and floods: up to 100 storms and around 50–200 floods per year. • Droughts and extreme temperatures show some variability per year but storms and floods show much higher variability. • Figure 7c indicates that there is only a moderate increase in extreme temperatures over the 1980–2011 period.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Question number	Indicative content
7(f)	**AO2 (4 marks)/AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO2** • The term climate change can be defined in a range of ways, often to suit different arguments. • Climate change will have an impact on soil, temperature, rainfall and weather events. • Climate change could threaten fragile environments, e.g. tropical rainforests or coral reefs, in terms of structure, function and biodiversity. • Fragile environments may be threatened by rising sea levels caused by climate change; ecosystem biodiversity could be threatened by animals migrating because they cannot adapt to the changing climate of their current habitat. • Responses may be either based around adaptation or mitigation.

	AO3 • Attempts to mitigate against climate change threats, e.g. through sustainable management, can vary significantly for different fragile environments (judgements will depend on case studies). • A specific ecosystem's natural ability to adapt to climate change can vary, which means impacts of climate change will be 'threats' only to ecosystems that cannot adapt. • A main cause of climate change is greenhouse gas emissions – and the challenge is to reduce these emissions. This can be done by reducing fossil fuel consumption, finding alternative energy sources, reducing deforestation, e.g. in tropical rainforests, and developing carbon capture technologies. However, different groups of people have different opinions about which strategy is the best/most effective. • The challenge of climate change crosses international boundaries and, therefore, international cooperation is crucial, e.g. Kyoto, 1997. However, arriving at agreement is never a straightforward process. • The development of alternative energy sources, such as wind farms, nuclear power, HEP and solar panels will reduce fossil fuel consumption, but the development of each type of source has its own advantages and disadvantages. **AO4** • Figure 7a shows rapid increases in temperature and CO_2. • Figure 7c shows an overall increase in all types of climate disasters during the period 1980–2011. • Figure 7c shows that the most significant rises have been in storms and floods: up to 100 storms and around 50–200 floods per year. • Droughts and extreme temperatures show some variability per year but storms and floods show much higher variability. • Figure 7c indicates that there is only a moderate increase in both droughts and floods over the 1908–2011 period.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	**1–4**	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**5–8**	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**9–12**	• Demonstrates accurate understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provides logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
8(a)(i)	**AO1 (1 mark)** C Find a job	**(1)**

Question number	Answer	Mark
8(a)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following. • Low wages/incomes in the countryside (1). • Poor harvest/low crop yields (1). • Lack of (education/health) services (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
8(b)(i)	**AO1 (1 mark)** • Voluntary migration is where a person chooses (i.e. they are not forced) to move to another place to live (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
8(b)(ii)	**AO3 (2 marks)** Award 1 mark for any of the following, up to a maximum of 2 marks. • Norway (1) • Australia (1) • Namibia (1)	**(2)**

Question number	Answer	Mark
8(b)(iii)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark for the identification of a possible reason for the pattern shown in Figure 8a (AO3) and a further 1 mark for an explanation of the reason (AO2), up to a maximum of 2 marks per factor. • More job opportunities in some countries (1), which will increase levels of disposable income (1). • Better services (1), which could lead to people gaining more qualifications (education) or living longer (health) (1). • People are attracted to areas with a less extreme climate (1), which makes it easier to grow crops (1). • People migrate to areas with greater political stability (1) so that they have greater freedom of speech/employment opportunities (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
8(c)	**AO1 (2 marks)/AO2 (2 marks)** Award 1 mark (AO1) for the identification of a reason and a further 1 mark (AO2) for an explanation of the reason, up to a maximum of 2 marks per benefit. • Money is brought into the host country (1), which can be used to invest in new infrastructure (1). • TNCs may improve existing infrastructure themselves (1), which may improve communication/accessibility for people living in the host country (1). • New jobs are created (1), which means that there will be more people paying taxes to the government (1). • Idea of the multiplier effect (1), which raises the standard of living for many more people living in the area (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
8(d)(i)	**AO4 (2 marks)** Award 1 mark for a correct answer and 1 mark for working. (new number) 19 000 – (old number) 10 000 = increase of 9000 (1) (increase of) 9000 divided by (old number) 10 000 × 100 = percentage increase of 90% (1) Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
8(d)(ii)	**AO3 (2 marks)** Award 1 mark for the identification of a pattern and a further 1 mark for further detail through description or use of supporting data from the resource, up to a maximum of 2 marks. • No clear relationship between total manufacturing production and time (1), e.g. it has increased markedly in Asia Pacific but has stayed fairly constant in Western Europe (1). • Most regions experienced an increase between 2005 and 2008 (1) and a decline between 2008 and 2009 (1). Accept any other appropriate response.	**(2)**

Question number	Indicative content
8(e)	**AO3 (3 marks)/AO4 (3 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • Locations that have a large number of visitors will benefit from considerable foreign exchange and might be known as 'world cities'. • Large numbers of visitors generally boost the local and regional economy, creating jobs (although many might be poorly paid and/or seasonal). • Tourism can have indirect impacts on agriculture and manufacturing, e.g. buying food and souvenirs. • In some places, tourism brings congestion and pollution, especially in cities where vehicle transport is a problem. • There is also a linked issue of overuse of valuable water supplies for tourists' demands. • Local culture/traditions may be a reason why tourists visit a particular destination. However, in some destinations, the traditional way of life is being replaced by a more westernised culture in response to the demands of tourism. **AO4** • Figure 8c shows a big variation in the numbers of international visitors to cities, ranging from 18.8 million down to 5.2 million. • London has the most overseas international visitors (18.8 million). • The bottom ten cities have less range – 8.6 million–5.2 million. • The top four locations attract considerably more visitors between them than the rest of the locations. • The locations are a mixture of high income country (HIC) and low income countries (LICs).

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Question number	Indicative content
8(f)	**AO2 (4 marks)/AO3(4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO2** • There are different types of migration. The two main categories are voluntary migration (people have chosen to move) and forced migration (caused by a push factor, such as war, famine or religious persecution). • Global migration has increased in recent years, e.g. the mass migration in 2015 and 2016 from Syria and Afghanistan to Europe. • Several factors have increased the rate of migration, such as improvements in communications, transport and the relaxation of national boundaries. • The enlargement of the European Union (EU) triggered a marked increase in population flows within Europe, mainly for economic reasons. • The process of migration can have both advantages and disadvantages for the host country and country of origin. The challenge is to try and manage these impacts in a sustainable way. **AO3** • Population flows often lead to a complex combination of impacts, some good and some bad, for different groups of people. For example, migration could be good for the host country because it can stimulate economic growth, but it can also create unrest and conflict as residents of the host country may perceive the migrants in a negative way. • In recent years, the challenge of managing migration has been made increasingly complex with rising numbers of refugees and asylum seekers. Issues arise with these types of migrants in host countries and some people object to resources being used to support them. • There are different approaches to managing the impacts of migration, but these approaches rarely satisfy the needs of all stakeholders. • The number of migrants a country receives is influenced by the country's migration policy. Countries such as the UK operate a points-based system. People are awarded points depending on their skills, previous income and age. This system gives some people visas to allow them entry into the UK for work, especially where there is a shortage of labour in that sector. • Migration laws are complex and they are different in different countries, even if all are within the EU.

	AO4 • Figure 8a shows that some parts of the world, e.g. USA, Canada, Western Europe, Australia, have experienced a net increase in net migration. • Figure 8a shows that some parts of the world, e.g. Brazil and much of Africa, India, China and parts of the Middle East, have experienced a net decrease in net migration. • Some areas in Figure 8a, e.g. Argentina, have not seen any change in their net migration figure, but these countries are in the minority. • Figure 8b shows that some parts of the world, e.g. Asia Pacific and Western Europe, have seen an increase in manufacturing, a potential pull factor for economic migrants. • Figure 8c shows information for population movement for tourism, with the most popular places being London, Bangkok and Paris. Therefore, sustainable management strategies will be needed to manage the impacts of these large volumes of short-term migrants.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**5-8**	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Level	Mark	Descriptor
Level 3	**9-12**	• Demonstrates accurate understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provides logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
9(a)(i)	**AO1 (1 mark)** D Average income earned per person	**(1)**

Question number	Answer	Mark
9(a)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following. • Mean years of schooling (1). • Expected years of schooling (1). • Life expectancy at birth (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
9(a)(iii)	**AO1 (1 mark)** • The total value of goods produced and services provided in a country during one year – or similar (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
9(b)(i)	**AO3 (2 marks)** Award 1 mark for any of the following, maximum 2 marks. • Somalia (1) • Angola (1) • Venezuela (1)	**(2)**

Question number	Answer	Mark
9(b)(ii)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark for the identification of a possible reason for the pattern shown on Figure 9a (AO3) and a further 1 mark for an explanation of the reason (AO2), up to a maximum of 2 marks per idea. • In some parts of the world, corruption might be high because some governments might be more open to bribery than others (1). Detail/example of same (1). • Electoral fraud/rigging or influencing of elections might occur in some parts of the world, leading to a high corruption rating (1) where illegal activity brings about a desired election result (1). • Public money might often be used by the government illegally in some areas, leading to a high corruption rating (1). Detail/example of same (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
9(c)	**AO1 (2 marks)/AO2 (2 marks)** Award 1 mark (AO1) for the identification of a reason and a further 1 mark (AO2) for an explanation of the reason, up to a maximum of 2 marks per reason. • Limited access to family planning services (1), which means that forms of contraception are not easily available (1). • In some parts of the world, contraception and other methods of family planning may not be culturally or religiously acceptable (1), leading to a larger number of (unplanned) births (1). • Children are a valuable source of labour and income for a family (1) because they can work on the land from a young age (1). • High rates of infant mortality in a country (1) mean that women need to have many children in order to ensure that some survive through to adulthood (1). • Falling death rates in a country (1) due to improvements in healthcare (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
9(d)(i)	**AO4 (2 marks)** Award 1 mark for a correct answer and 1 mark for working. (new number) 0.88 – (old number) 0.73 = increase of 0.15 (1) (increase of) 0.15 divided by (old number) 0.73 × 100 = percentage increase of 21% (1) Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
9(d)(ii)	**AO3 (2 marks)** Award 1 mark for the identification of a pattern and a further 1 mark for additional detail through description or use of supporting data from the resource, up to a maximum of 2 marks. • There is a positive relationship (1) but the amount of increase is more rapid in some countries than in others (1). • HDI score has gone up over time (1) but this increase has been uneven, with the most rapid increase taking place between 1980 and 2005 (1). Accept any other appropriate response.	**(2)**

Question number	Indicative content
9(e)	**AO3 (3 marks)/AO4 (3 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • The core and periphery model states that some areas develop faster because of human and physical advantages and these become the core. Other areas that lack human and physical advantages become the less important periphery. • Core areas are likely to experience greater growth, investment and net migration gain, while the peripheries may well be exploited and suffer from lack of investment. • Core areas are often major cities and these develop faster and to a greater extent compared to more rural/smaller urban peripheral areas. • The reasons why core areas develop can be linked to their geographical position and the natural resources in a country, e.g. in a coastal area or an area that does not experience an extreme climate. • The reasons why core areas develop in a country can also be attributed to human factors, including government policies, population flows, quality of infrastructure and investment by TNCs. **AO4** • Figure 9c shows that areas such as Maranhão have a lower GDP per capita than places like São Paulo. This might be because São Paulo has exploited the peripheral areas, e.g. Maranhão or Piauí. This might be in terms of net migration gain or exploitation of resources. Therefore, an interrelationship exists between the core and the periphery. • Brazil has a number of smaller core areas, such as Mato Grosso and Rio de Janeiro. This means that, as these grow, the overall level of development for the country will increase and the pattern of unevenness of development will continue to change, possibly in the growing gap between the rich and the poor. • Patterns of GDP per capita in Figure 9c are not fixed. This includes the influence of core areas as fluid, e.g. the decline of some core areas due to deindustrialisation or the effects of rapid urban growth.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Question number	Indicative content
9(f)	**AO2 (4 marks)/AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO2** • Bottom-up development projects and the use of intermediate or appropriate technology is a move away from big aid projects. • Intermediate technology is usually labour-intensive, utilising and creating employment for local labour. • Intermediate technology uses sustainable technology and the tools/knowledge of local people. **AO3** Advantages of intermediate technology include the following. • It aims to use simpler technologies that are right for the people, right for the environment and right for the donor. In most poor countries, high-tech industries are too expensive to develop and are inappropriate to the needs of local people. This is particularly true for recipient countries with a low HDI score (Figure 9b). • It uses newly-developed technologies that are low cost and local, which local people can manage and control rather than using imported techniques and technologies. • It employs local people who are making the decisions, benefiting from employment and purchasing cheap products that they actually need. They are using local resources and skills so, if the machinery or tools of production break down, they will be able to fix them. In addition, it is unlikely that they will have accrued much, if any, debt. Potential disadvantages of intermediate technology include the following. • One disadvantage of appropriate technology is that sometimes a solution simply does not work as planned. Since it is a relatively new field of study, there is still much work that needs to be done on the most effective way to apply the resources available in the area of need. What might be very practical and cheap in one area of the world would be ridiculously expensive or not work at all in another region. • Cultural differences, language barriers and other emerging challenges could hinder the success of a project. • There are the problems of a sustainable solution creating other problems. For example, a micro-hydroelectric plant might be built in a remote village to provide the village with power. Each hut would own its own battery that could be charged at the micro-hydro then be taken home to provide power. Batteries, however, don't last for an extremely long time and are filled with toxic materials and this then presents problems in terms of waste disposal.

	• Most appropriate technology applications are built for small-scale use and work well for small, remote villages. But appropriate technological solutions pose more problems for large-scale applications. Some forms of sustainable resources are very expensive and not practical for extensive use. Therefore, the cost becomes much greater than current methods, making it not as economically feasible. This is especially true for countries that are already technologically advanced. **AO4** • Figure 9b shows that global HDI scores vary considerably, supporting the idea that a development gap exists. Therefore, it is essential that the right sort of strategy is used to improve the quality of life regardless of a country's level of development. • Figure 9a shows the global pattern of political corruption, with many countries in Africa, South America and Asia scoring highly. This strengthens the agreement that bottom-up strategies might be more effective than top-down development projects. • Figure 9c supports the core/periphery idea. This choropleth map is for Brazil and shows that certain parts of the country are more developed/have higher levels of GDP per capita than others. This might be linked to the idea that top-down projects might have limited impact in the further reaches of a country.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**5–8**	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Level	Mark	Descriptor
Level 3	**9–12**	• Demonstrates accurate understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provides logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

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Registered Office: 80 Strand, London WC2R 0RL
VAT Reg No GB 278 537121

Getty Images: Alex Belmonlinsky

ISBN 978-1-4469-4934-4