UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

2648455579

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2012**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Calculator
Ruler

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

The Insert contains Fig. 2 for Question 1 and Figs 5 and 6 for Question 2.
The Insert is **not** required by the Examiner.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Q1	
Q2	
Total	

This document consists of **15** printed pages, **1** blank page and **1** Insert.

1 Some students who lived near to the coast at latitude 55 °N were investigating coastal processes at three locations.

For Examiner's Use

(a) Before going to the coast to begin their fieldwork on waves and beaches they discussed safety measures. Suggest **three** precautions the students needed to take to reduce the risk of accident.

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The students investigated the following hypotheses:

Hypothesis 1: *Where waves are more frequent the beach is steeper.*

Hypothesis 2: *Where waves are more frequent the beach material is larger.*

(b) First, the students measured wave frequency at the three locations. Their results are shown in Table 1 below.

Table 1

Wave frequency at the three locations

Location	Waves per minute
A	16
B	9
C	7

(i) How could wave frequency be measured?

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(ii) Complete Fig. 1 below, to show the recorded wave frequency at location B.

For Examiner's Use

Wave frequency

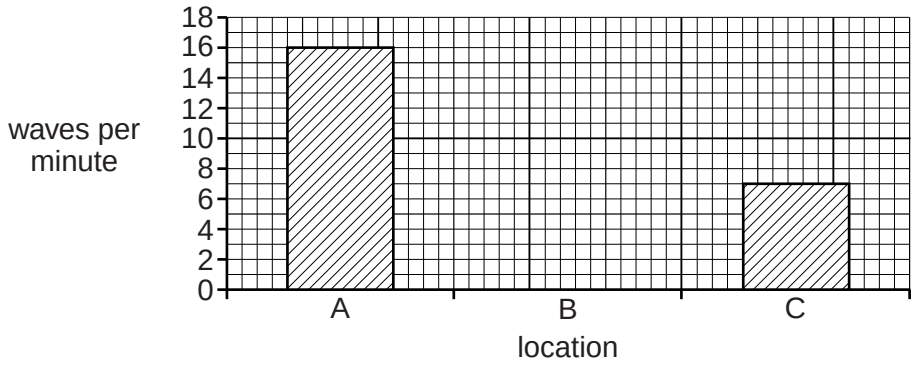

Fig. 1 [1]

(iii) The waves at location A were 'destructive' waves. Give **two** features of destructive waves.

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(c) Next, the students measured the beach profile along transects at each of the locations A, B and C.

(i) They used a tape measure, two ranging poles and a clinometer, which are shown in Fig. 2 (Insert). Describe how they used each piece of equipment to make their measurements.

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(ii) The results of the fieldwork are shown in Table 2 below.

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Calculate the average angle of the beach profile at location B and put your answer into Table 2. [1]

Table 2

Beach profiles

	Transect at location A	**Transect at location B**	**Transect at location C**
Distance from low water mark (m)	Angle of slope in degrees (°)	Angle of slope in degrees (°)	Angle of slope in degrees (°)
3	5	3	2
6	9	5	4
9	10	3	3
12	12	7	4
Average angle of slope in degrees (°)	9.0		3.25

(iii) What would be the students' conclusion about **Hypothesis 1:** *Where waves are more frequent the beach is steeper*? Use data from Tables 1 and 2 to support your decision.

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(d) To investigate **Hypothesis 2:** *Where waves are more frequent the beach material is larger* the students sampled the beach material at each location. They took samples every two metres along the three beach transects.

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(i) A completed data recording sheet for one site along the transect at location C is shown in Fig. 3 below.

Data recording sheet

Transect: C	
Distance from low water mark: 6 m	
Beach material number	Size of beach material (mm)
Stone 1	8
Stone 2	19
Stone 3	9
Stone 4	29
Stone 5	23
Stone 6	18
Stone 7	12
Average size	16.9

Fig. 3

Describe how the student collected the data shown in Fig. 3.

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(ii) The average size of all the beach material samples are shown in Table 3 below.

For Examiner's Use

Table 3

Average results of beach samples

Distance from low water mark (m)	Transect at location A: average size of beach materials (mm)	Transect at location B: average size of beach materials (mm)	Transect at location C: average size of beach materials (mm)
2	74.2	8.4	3.6
4	81.7	10.3	4.0
6	98.6	36.1	16.9
8	89.6	60.6	52.3
10	94.1	76.0	61.2
12	96.0	136.0	105.7

On Fig. 4 below, plot the result for 10 metres from the low water mark at location B. [1]

Average results of beach samples

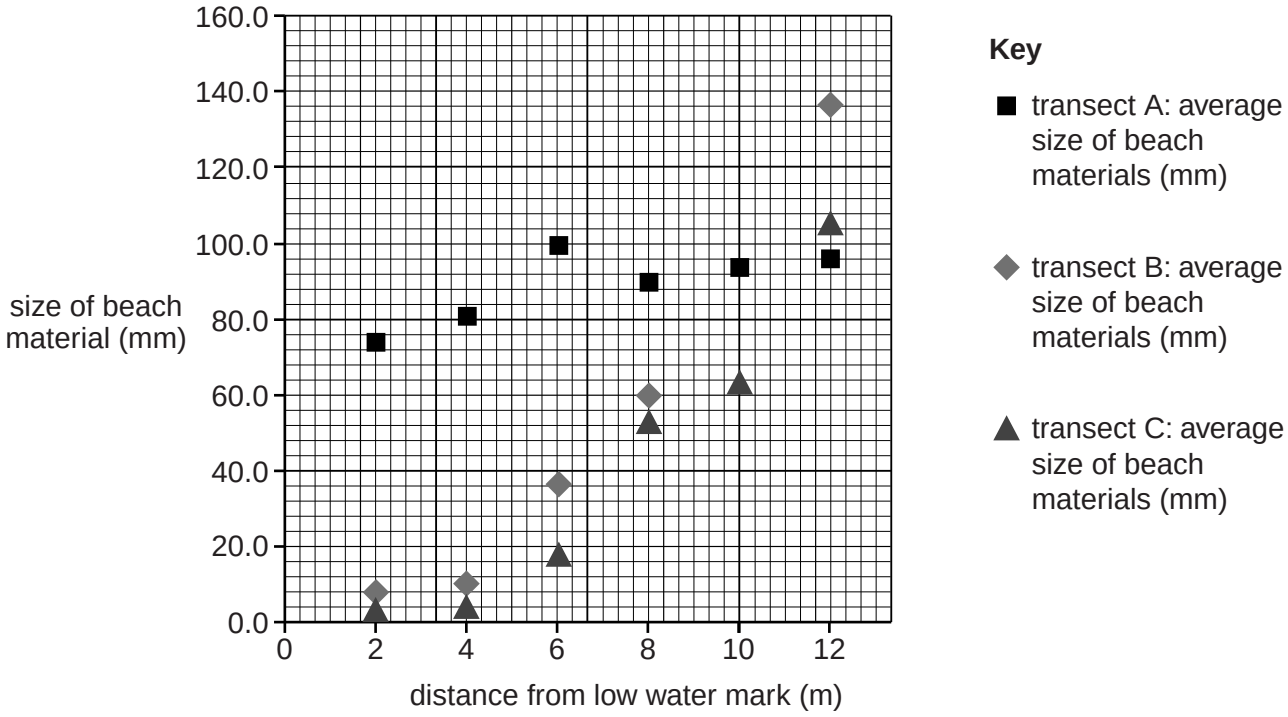

Fig. 4

(iii) Do the results shown in Fig. 4 support **Hypothesis 2:** *Where waves are more frequent the beach material is larger*? Justify your answer with data from Tables 1 and 3 and Fig. 4.

For Examiner's Use

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(e) Later the students discussed their beach fieldwork and how they could have improved the accuracy and reliability of the measurements. What suggestions could they have made?

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(f) The students thought that people may have affected the natural wave processes and beaches which they had investigated.

Describe **two** ways that people can affect wave movement and beaches.

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[Total: 30 marks]

2 Students were studying patterns of urban structure in MEDCs. They decided to do some fieldwork about different types of housing area in order to investigate a textbook model of land use. This model is shown in Fig. 5 (Insert).

For Examiner's Use

(a) Give **two** reasons why there are different areas of land use in cities in MEDCs.

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The students selected three different types of housing areas based on the land use model. These housing areas are labelled A, B and C in Fig. 6 (Insert).

The students investigated the following hypotheses:

Hypothesis 1: *The environment of housing areas improves as distance from the town centre increases.*

Hypothesis 2: *The nearer people live to the CBD the better their access to services.*

(b) In order to investigate **Hypothesis 1** the students did an environmental quality survey in one road in each housing area. Their recording sheet is shown in Fig. 7 below.

Environmental quality recording sheet

Location: Area A / B / C (circle the area)							
Feature	**Negative description**	**–2**	**–1**	**0**	**+1**	**+2**	**Positive description**
Housing layout and design	Poor, identical and low quality						Varied, well spaced out and high quality
Building care and condition	Poorly maintained and unattractive						Well maintained and attractive
Gardens	Very few private gardens and poorly maintained						Individual gardens and well maintained
Public open space	None, unattractive natural environment						Plenty, and attractive natural environment
Car parking	Mainly on roads						Mainly on private drives
Traffic noise and fumes	Noisy, high level of pollution						Quiet, low level of pollution
Litter	Much litter						No litter
Vandalism and graffiti	Widespread damage and graffiti						No vandalism and graffiti

Fig. 7

(i) Describe how the students used the recording sheet.

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(ii) First, the students did a pilot (trial) survey in a road near their school. Suggest **two** advantages of doing a pilot survey.

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(c) The results of the environmental quality survey are shown in Table 4 below.

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Table 4

Results of survey

Feature	Road in area A	Road in area B	Road in area C
Housing layout and design	–2	–1	+2
Building care and condition	–1	0	+2
Gardens	–2	+1	+2
Public open space	0	–1	0
Car parking	–2	+1	+2
Traffic noise and fumes	–2	+1	+2
Litter	+1	0	+1
Vandalism and graffiti	+1	–1	+2
Total score	**–7**	**0**	**+13**

(i) Use the results from the road in area B to complete the bi-polar graph (Fig. 8) below. [3]

Bi-polar graph

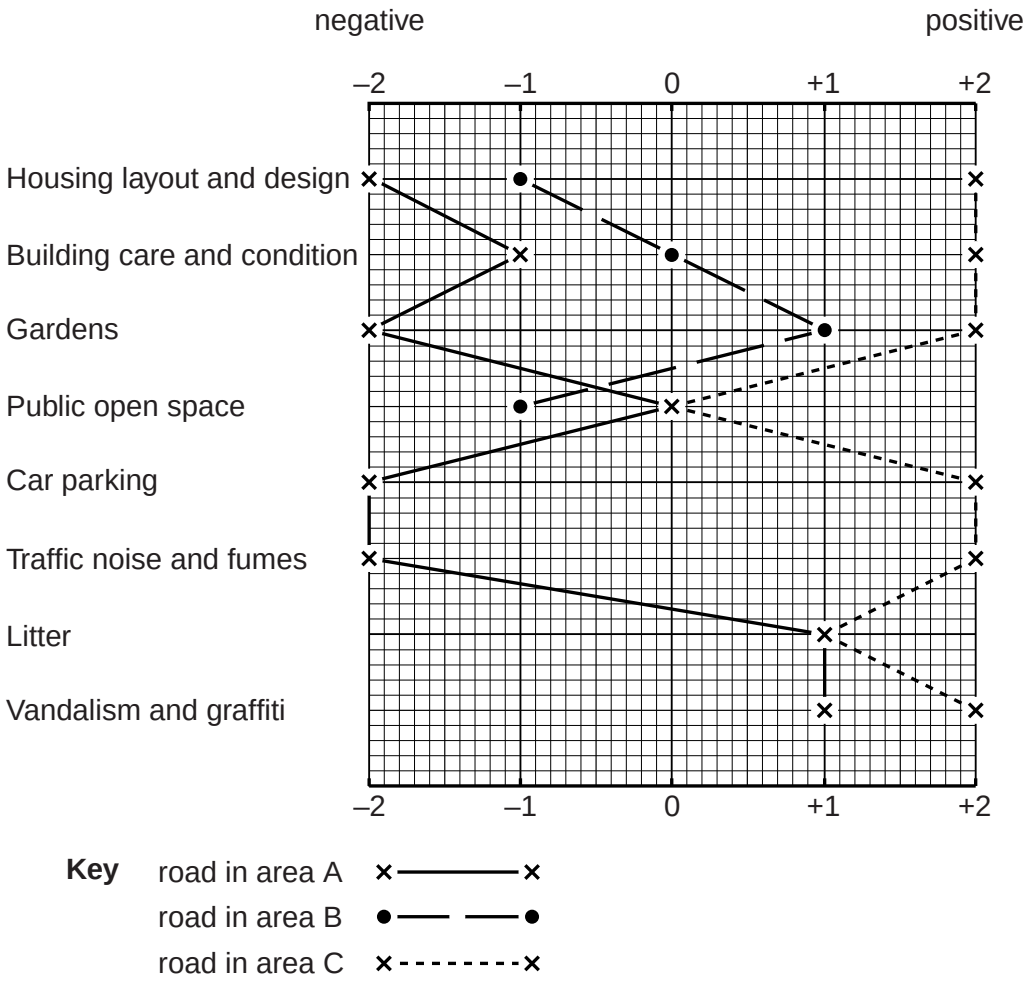

Fig. 8

(ii) The students decided that **Hypothesis 1:** *The environment of housing areas improves as distance from the town centre increases* was true. Use data from Table 4 and Fig. 8 to support their conclusion.

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(iii) Suggest **two** weaknesses of the students' fieldwork which may put doubt on their conclusion that the hypothesis is true.

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(d) To investigate **Hypothesis 2:** *The nearer people live to the CBD the better their access to services* the students asked 15 residents in each of the three areas how much time it took them to walk to a number of services.

(i) Suggest how the students could get a representative sample of people to take part in their survey.

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An example of a partly completed survey sheet is shown in Fig. 9 below.

For Examiner's Use

Survey sheet

Residential area: A

How long does it take you to walk to the following services (nearest one)?

Circle your answer

Park	**(less than 5 minutes)**	5 – 30 minutes	more than 30 minutes
Supermarket	less than 5 minutes	**(5 – 30 minutes)**	more than 30 minutes
Primary school	**(less than 5 minutes)**	5 – 30 minutes	more than 30 minutes
Secondary school	less than 5 minutes	**(5 – 30 minutes)**	more than 30 minutes
Doctors' surgery / Health centre	less than 5 minutes	5 – 30 minutes	more than 30 minutes
Bus stop	**(less than 5 minutes)**	5 – 30 minutes	more than 30 minutes
Cinema	less than 5 minutes	5 – 30 minutes	more than 30 minutes
City centre shops	less than 5 minutes	**(5 – 30 minutes)**	more than 30 minutes
Sports centre	less than 5 minutes	5 – 30 minutes	**(more than 30 minutes)**
Local store	**(less than 5 minutes)**	5 – 30 minutes	more than 30 minutes

Fig. 9

(ii) Complete Fig. 9 by including the following information for a resident in area A:

Time taken to walk to doctors' surgery: 6 minutes

Time taken to walk to cinema: 40 minutes [1]

(iii) What are **two** possible weaknesses of the question 'How long does it take you to walk to the following services'?

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(iv) When they had completed their survey the students used a scoring system to produce an accessibility index. This is shown in the table below.

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Time taken	Score
Less than 5 minutes	3 points
Between 5 minutes and 30 minutes	2 points
More than 30 minutes	1 point

Use this scoring system to complete an accessibility index for a resident of area B shown in Fig. 10 below. Insert the score for the local store and the total score. [2]

Accessibility index

Residential area: B

How long does it take you to walk to the following services (nearest one)?

Circle your answer				**Score**
Park	less than 5 minutes	(5 – 30 minutes)	more than 30 minutes	2
Supermarket	less than 5 minutes	(5 – 30 minutes)	more than 30 minutes	2
Primary school	(less than 5 minutes)	5 – 30 minutes	more than 30 minutes	3
Secondary school	less than 5 minutes	(5 – 30 minutes)	more than 30 minutes	2
Doctors' surgery / Health centre	less than 5 minutes	(5 – 30 minutes)	more than 30 minutes	2
Bus stop	(less than 5 minutes)	5 – 30 minutes	more than 30 minutes	3
Cinema	less than 5 minutes	5 - 30 minutes	(more than 30 minutes)	1
City centre shops	less than 5 minutes	5 – 30 minutes	(more than 30 minutes)	1
Sports centre	less than 5 minutes	5 – 30 minutes	(more than 30 minutes)	1
Local store	(less than 5 minutes)	5 – 30 minutes	more than 30 minutes	
Total accessibility index score				

Fig. 10

(v) Plot the accessibility index you calculated in **(d)(iv)** on the dispersion graph, Fig. 11 below. [1]

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Dispersion graph

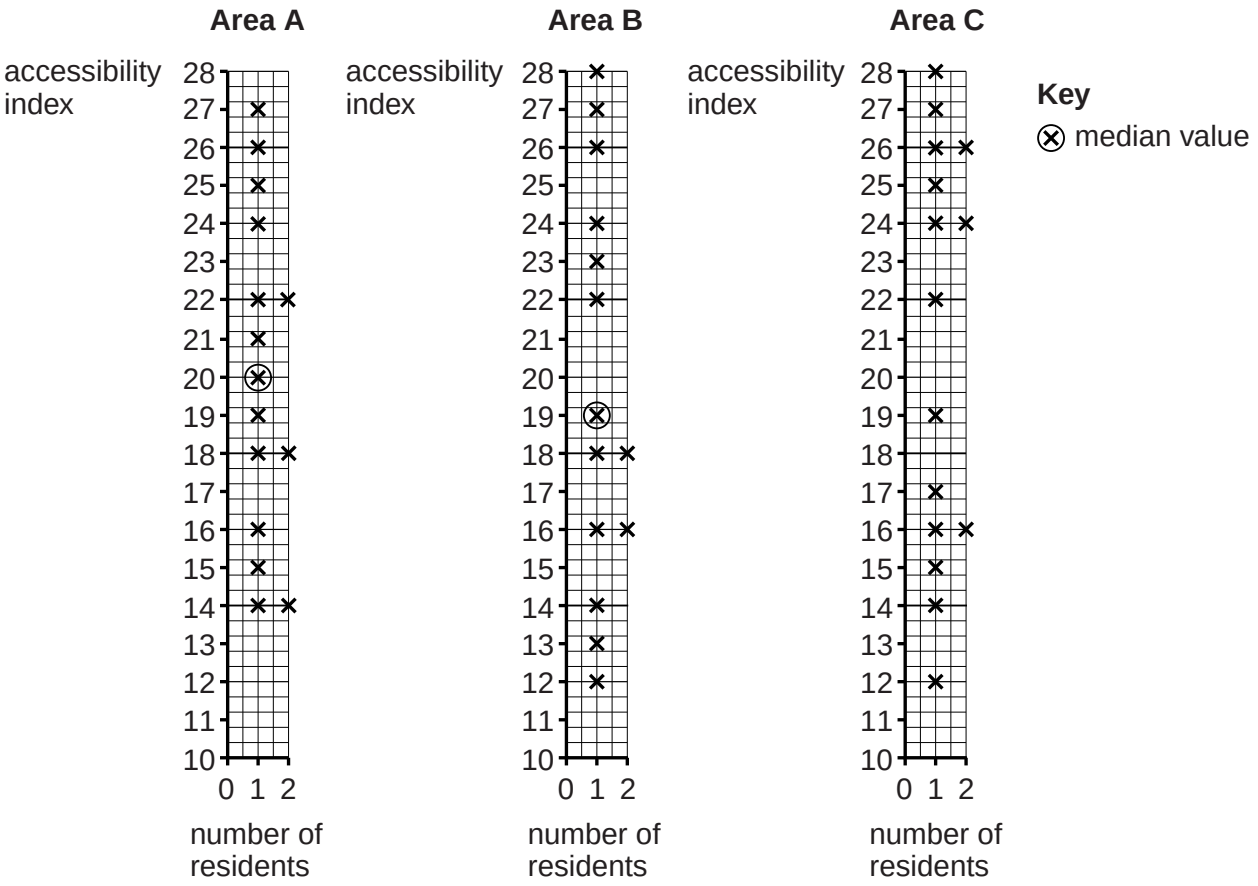

Fig. 11

(vi) The median (middle) values of the accessibility index in areas A and B are shown on Fig. 11. Circle the median value for area C. [1]

(vii) What was the students' conclusion about **Hypothesis 2:** *The nearer people live to the CBD the better their access to services*? Support your decision with evidence from Fig. 11.

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(e) Suggest **two** reasons for the difference in accessibility index scores in one area.

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[Total: 30 marks]

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