UNIVERSITY OF CAMBRIDGE INTERNATIONAL EX
International General Certificate of Secondary Educati

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CAN NUMBER

5801311216

GEOGRAPHY **0460/42**

Paper 4 Alternative to Coursework **October/November 2013**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler
Calculator

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 ON ANY BARCODES.

Answer **all** questions.

The Insert contains Fig. 1, Table 1 and Photograph A for Question 1, and Figs 5 and 6 and Table 3 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 **14** printed pages, **2** blank pages and **1** Insert.

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1 Students from Santiago, Chile, were studying how the charact downstream. They wanted to investigate possible changes in downstream.

They decided to test the following hypotheses:

Hypothesis 1: *Velocity increases downstream.*

Hypothesis 2: *Velocity increases as the hydraulic radius of t*

Hydraulic radius is a measurement which indicates how much fri river channel and the flow of the river.

(a) (i) The students carried out their fieldwork at five sites along the river. Suggest **three** factors the students should have considered in choosing their fieldwork sites.

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..... [3]

(ii) Suggest why it was important that they made all of their measurements on one day.

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..... [1]

(iii) In preparation for their fieldwork the students visited a local stream to do a trial (pilot) study. Give **two** advantages of doing a trial (pilot) study.

1 .....

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(b) (i) Fig. 1 (Insert) is a student sketch which shows their met
Describe the method shown.

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(ii) Another way to measure velocity is by using a flowmeter. Describe how this is done.

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(iii) The results which the students obtained at the five sa
Table 1 (Insert). Use these results to complete Fig. 2, b
velocity changes downstream.

Changes in average velocity downstream

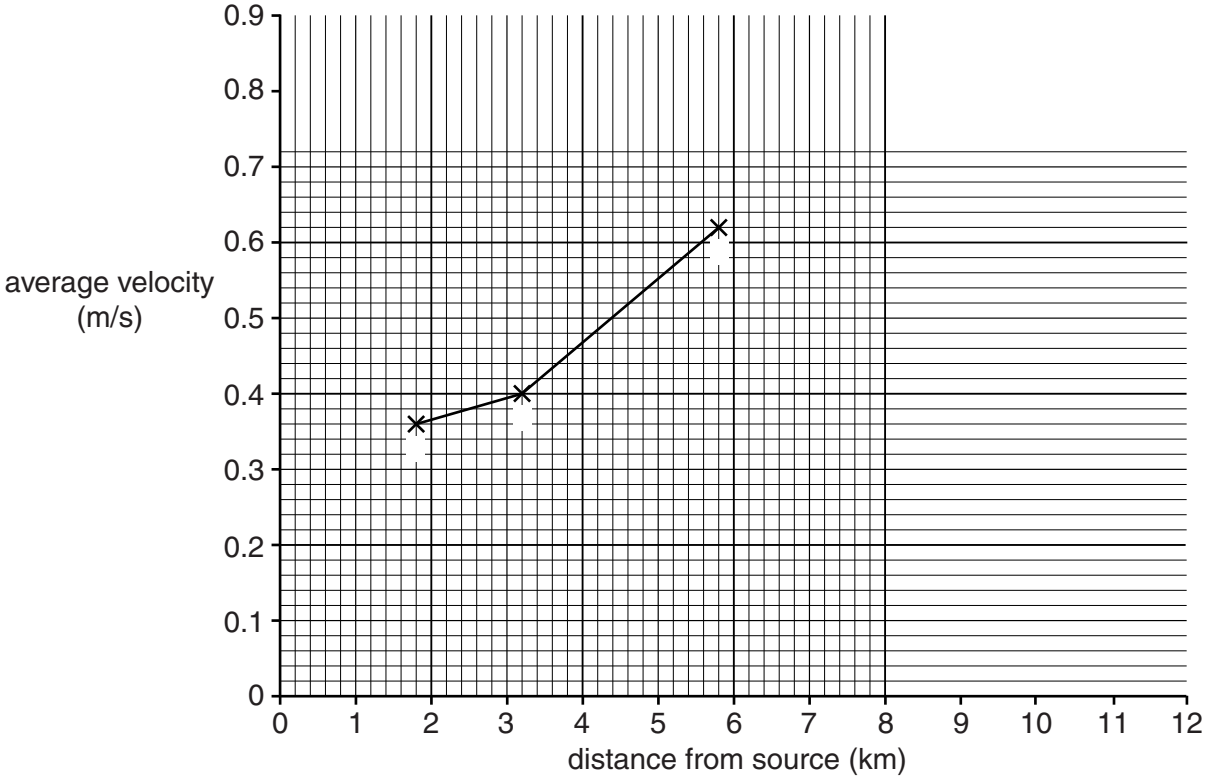


Fig. 2

(iv) What conclusion could the students make about **Hypothesis 1:** *Velocity increases downstream*? Support the conclusion with evidence from Fig. 2 and Table 1.

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(c) Hydraulic radius is a measurement which indicates how muc
the river channel and the flow of the river. Hydraulic radius is
formula:

$$\frac{\text{cross-sectional area}}{\text{wetted perimeter}}$$

(i) In order to calculate the cross-sectional area the stude
the river channel and the depth of the river at points
equipment would the students use and how would they

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(ii) The results of sample measurements made at site 3 are shown in Table 2, below.

Table 2

Sample measurements made at site 3

Distance across channel (m)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
Depth of river (m)	0.15	0.21	0.29	0.26	0.24	0.20	0.19

Calculate the average depth of the sample measurements at this site.

Average depth = ...m [1]

(iii) The students measured the width of the river at site 4 as 8.2 m.
They calculated that the average depth at site 4 was 0.31 m.
Using this data calculate the cross-sectional area at site 4 below.

Cross-sectional area = width of river (m) × average depth of river (m)

Answer .....sq. m. [1]

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(iv) Next the students measured the wetted perimeter. The w
of the channel cross-section which the river touches. Ph
a way to measure the wetted perimeter.
This method is described in Fig. 3, below, which is pa
notebook.

Fieldwork notebook

Measuring the wetted perimeter

The tape was placed across the bed of the
starting and finishing at water level on both
banks.

To make the method more accurate a student
walked along the tape across the river.

Fig. 3

Suggest **two** disadvantages of this method in a large river.

1 .....

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(d) The students then calculated the hydraulic radius of eac formula:

$$\frac{\text{cross-sectional area}}{\text{wetted perimeter}}$$

The results of their calculations are shown in Table 1 (Insert).

(i) Complete the scatter graph, Fig. 4, below, by plotting the

Scatter graph of hydraulic radius and velocity

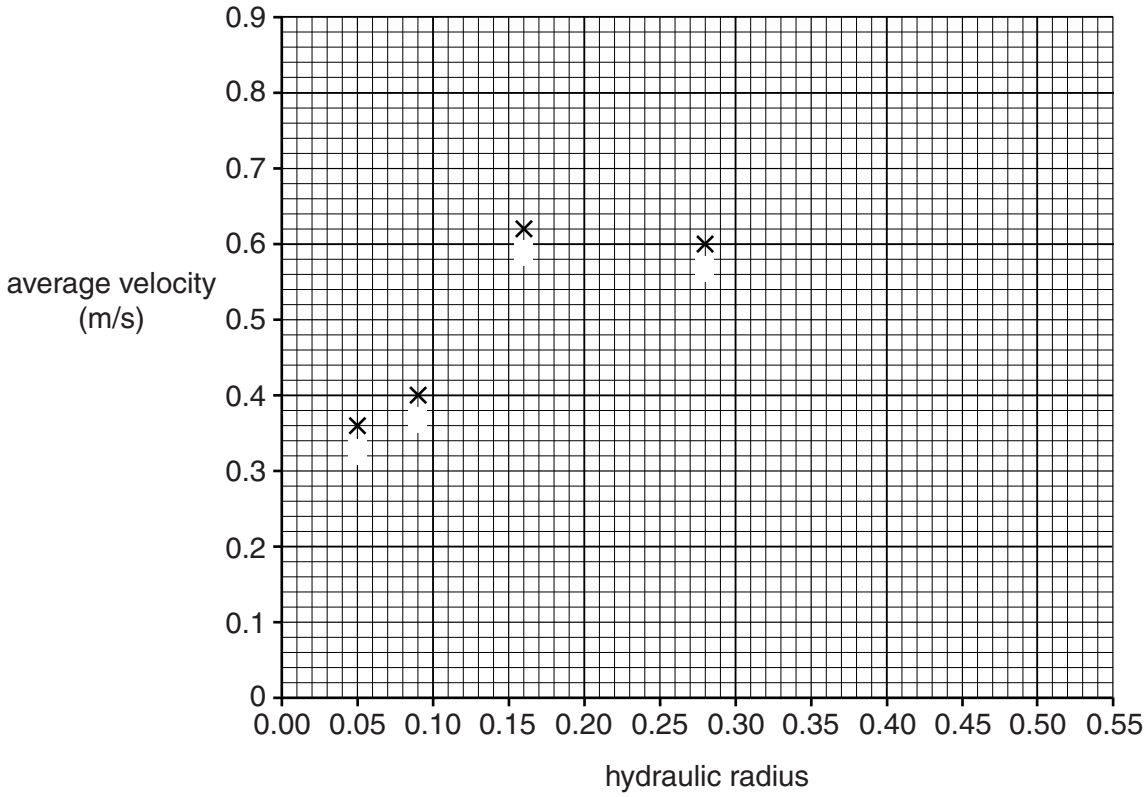


Fig. 4

(ii) The students reached the conclusion that **Hypothesis 2:** *Velocity increases as the hydraulic radius of the river channel increases* was correct. What evidence from Fig. 4 and Table 1 supports their conclusion?

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(e) Whilst doing the fieldwork one student noticed how the river
five sites. How could the student record these differences dur

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[Total: 30 marks]

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2 Students from Auckland, New Zealand, were studying land-use in model of land-use is shown in Fig. 5 (Insert). They decided to do so land-use patterns in the city where they lived.

(a) Give **two** reasons why there are different types of land-use in

1 .....

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The students investigated the following hypotheses:

Hypothesis 1: *Different types of land-use are located in different areas of the city.*

Hypothesis 2: *There is a relationship between the main type of land-use and the height of buildings.*

(b) To collect fieldwork data the students decided to follow three transects from the Central Business District (CBD) to the edge of the city.

(i) Give **three** characteristics of the CBD of a city.

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(ii) The students decided to do their data collection at 10 sites along each transect. These are shown on Fig. 6 (Insert).
Describe **one** way they could have chosen these sites.

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(c) At each sampling site the students recorded the ground-floo
on each side of the road. Their results from one site are show

Ground-floor land-use

Transect A site 3	
Left side of road	Right side of r
House	House
Apartments	House
Newsagents	Apartments
Tourist information office	Apartments
Insurance office	Food shop

Fig. 7

(i) Use this information to complete the following building classification which the students used. [2]

Use of building	Number of buildings at the site
Residential	
Offices	
Shops	
Industry	0

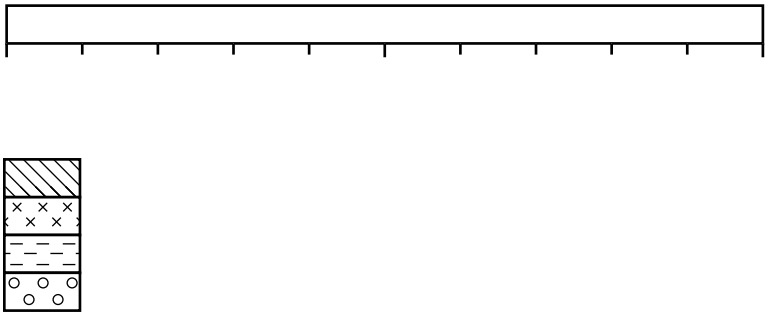
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(ii) Use the data below for **site 4 on transect C** to complet the site.

Transect C site 4	
Use of building	Number of building
Residential	2
Offices	0
Shops	1
Industry	7

Divided bar graph of ground floor land-use at site 4 on transect C



(iii) The students decided to show only the main type of land-use at each survey site on their map of the city (Fig. 6 Insert). For site 4 on transect C, above, this was industry. Do you agree with their decision to show only the main type of land-use? Circle your choice below.

Agree Disagree

Explain why you agree or disagree.

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(iv) Fig. 6 (Insert) shows the results of the students' fieldw
that **Hypothesis 1:** *Different types of land-use are locat*
city was correct. Support this decision with evidence fro

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(d) To investigate **Hypothesis 2:** *There is a relationship between the main type of land-use and the height of buildings*, the students counted the number of storeys of each building when they recorded its ground floor use.

(i) Suggest why this is an appropriate method of measuring the height of buildings.

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Then they calculated the average number of storeys at each site as shown in an example below.

Transect A Site 3			
Left side of road	Number of storeys	Right side of road	Number of storeys
House	3	House	2
Apartments	4	House	2
Newsagents	2	Apartments	6
Tourist information office	1	Apartments	6
Insurance office	1	Food shop	3

Average number of storeys per building = 30/10 = 3

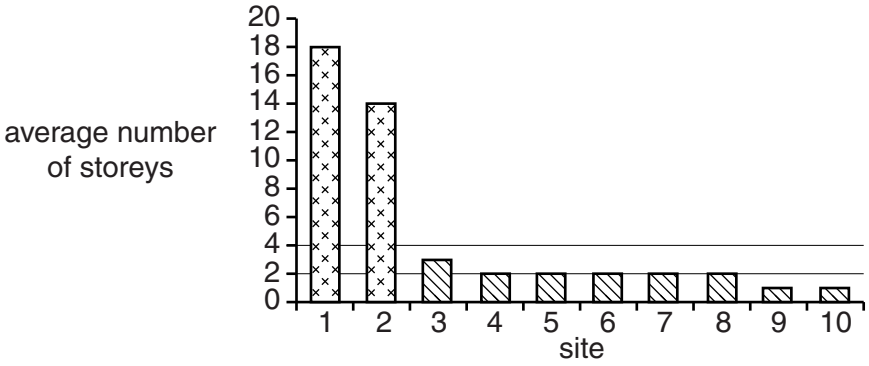
(ii) The results from all the sites on the three transects are shown in Table 3 (Insert). Use the data in Table 3 to complete Fig. 8 on page 14 (overleaf). You should plot sites 3 and 4 on transect C. [2]

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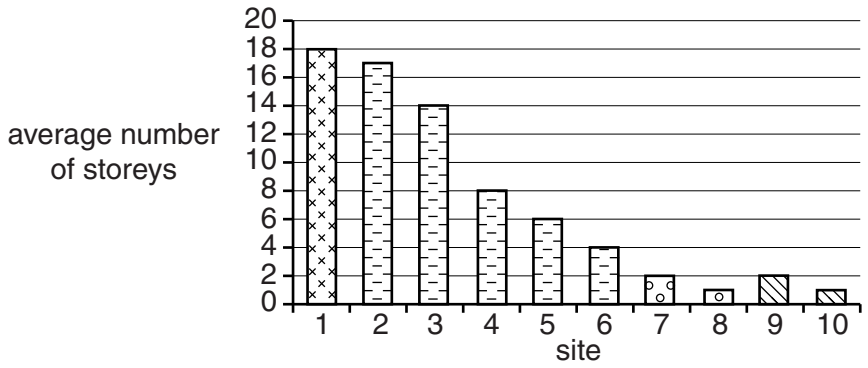
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Average number of storeys and main type of land-us

Transect A



Transect B



Transect C

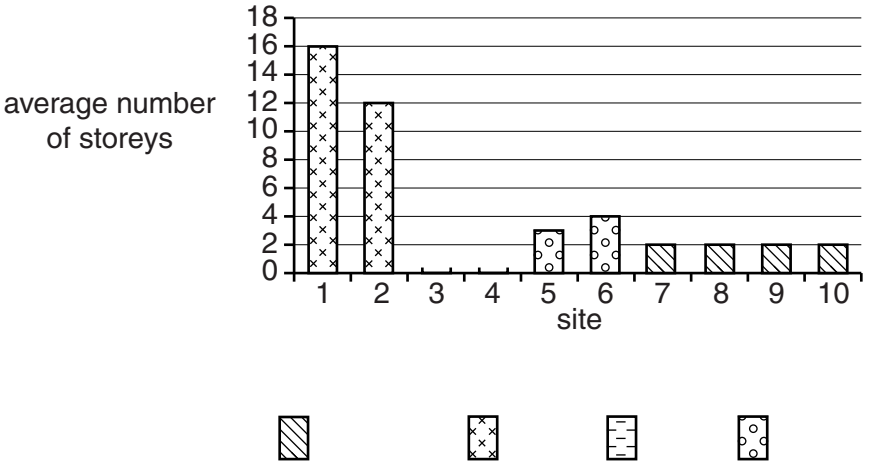


Fig. 8

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(iii) What conclusion would the students make about **H** *relationship between the main type of land-use and the h* your answer with evidence from Table 3 and Fig. 8.

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(iv) Explain why there are buildings of different heights in a city.

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(v) A common weakness of studies of urban land-use is that data is only recorded for the ground floor level. Suggest why this is a weakness.

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(e) One student wanted to extend her study by comparing the quality of the environment in different parts of the city. Describe how she could do this.

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[Total: 30 marks]

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