Cambridge IGCSE

CANDIDATE NAME		

CENTRE NUMBER						CANDIDATE NUMBER				

GEOGRAPHY 0460/43

Paper 4 Alternative to Coursework **October/November 2014**

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

The Insert contains Figs 1 and 3, Photograph A and Tables 1 and 2 for Question 1, and Fig. 5 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.

This document consists of **14** printed pages, **2** blank pages and **1** Insert.

[Turn over

1   Two groups of students were doing fieldwork in the Rio Santa Valley in Peru. They chose four sites along the river to investigate how the river changes downstream.

The students investigated the following hypotheses:

Hypothesis 1: *River velocity increases downstream.*

Hypothesis 2: *Rocks on the bed of the river (bedload) become smaller and more rounded downstream.*

(a) Each group used two different methods to measure velocity. In method 1 they used floating objects and in method 2 they used a velocity meter (flow meter). The velocity meter and how it is used are shown in Photograph A and Fig. 1 (Insert).

Describe the **two** different methods of measuring velocity.

Method 1 (using floating objects)

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Method 2 (using a velocity meter)

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[6]

(b) (i) The students agreed that method 1 (using floating objects) had produced unreliable results compared to method 2 (using a velocity meter). Suggest **three** reasons why method 1 may have produced unreliable results.

1 ....

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2 ....

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3 ....

.... [3]

(ii) The results of the students' measurements using a velocity meter are shown in Table 1 (Insert).
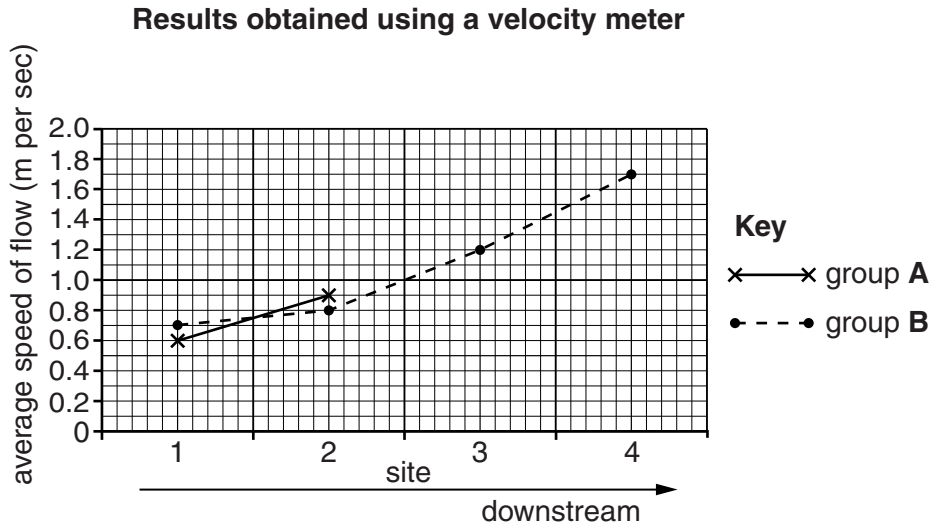Use the average velocity results to complete the graph for Group A in Fig. 2 below.   [2]

Results obtained using a velocity meter

Fig. 2

(iii) What conclusion would the students in **Group B** make about **Hypothesis 1**: *River velocity increases downstream*? Support the conclusion with evidence from Fig. 2.

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.... [2]

(c) Next the students made some measurements to investigate **Hypothesis 2**: *Rocks on the bed of the river (bedload) become smaller and more rounded downstream.*

(i) At each site the two groups of students selected 10 rocks at random from the river bed. They then measured the size and roundness of each rock using the equipment shown in Fig. 3 (Insert).

Describe how the students made the two measurements.

Size ....

....

Roundness ....

.... [2]

(ii) Suggest **two** weaknesses of selecting rocks at random.

1 ....

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2 ....

.... [2]

(iii) The results obtained by the two groups are shown in Table 2 (Insert). Plot the results of group B at site 3 on Fig. 4 below. [2]

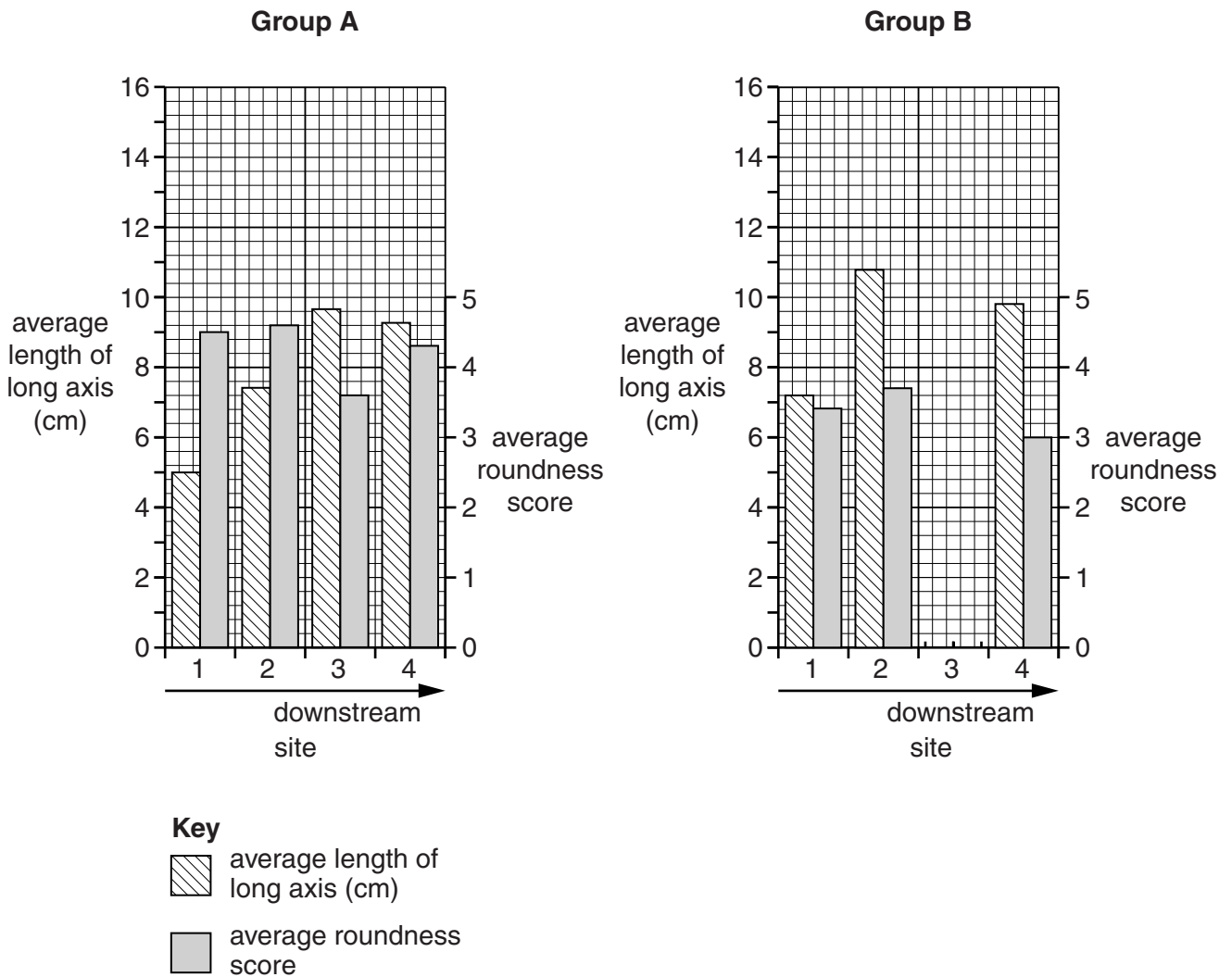**Results of bedload measurements**

Fig. 4

(iv) When they looked at their results the students in **Group A** came to the conclusion that **Hypothesis 2**: *Rocks on the bed of the river (bedload) become smaller and more rounded downstream,* was false. Give **two** pieces of evidence from their results in Fig. 4 to show why the students in Group A made this conclusion.

1 ....

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2 ....

.... [2]

(d) When the students returned to school their teacher was surprised by their results. The students then checked in a textbook and discovered that generally the rocks on a river bed become smaller and more rounded downstream.

(i) Explain why rocks generally become smaller and more rounded downstream.

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.... [3]

(ii) The students then thought about how they could improve the reliability of the method used during fieldwork if they repeated the task for **Hypothesis 2:** *Rocks on the bed of the river (bedload) become smaller and more rounded downstream*. Give **two** ways the reliability of the method could be improved.

1 ....

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2 ....

.... [2]

(e) Whilst the two groups of students worked on Hypotheses 1 and 2, other students were investigating different hypotheses. Describe a method to investigate the hypothesis: *The river channel becomes wider and deeper downstream.*

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.... [4]

[Total: 30 marks]

TURN OVER FOR QUESTION 2

[Turn over

2 Two students from the UK were investigating change in their local village. The village was located 8 km from the nearest large town and had been growing in population and size. The students decided to test the following hypotheses:

Hypothesis 1: *Most people who moved to live in the village came from less than 10 km away.*

Hypothesis 2: *The main reason why people live in the village is because their work is in the village or nearby.*

(a) To conduct their investigation the students produced a questionnaire to use with a sample of residents in the village. Their questionnaire is shown in Fig. 5 (Insert).

Name and describe a suitable sampling method to get a fair sample of residents.

Name of sampling method ....

Description...

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.... [3]

(b) The results of Question 1 from the questionnaire are shown in Table 3 below.

Table 3

Results of Question 1: How many years have you lived in the village?

Number of years	Percentage of residents
0 – 10	27
11 – 20	19
21 – 30	18
31 – 40	26
More than 40	10

Key

◼ 0 to 10 years
▨ 11 to 20 years
⬚ 21 to 30 years
☰ 31 to 40 years
⊠ more than 40 years
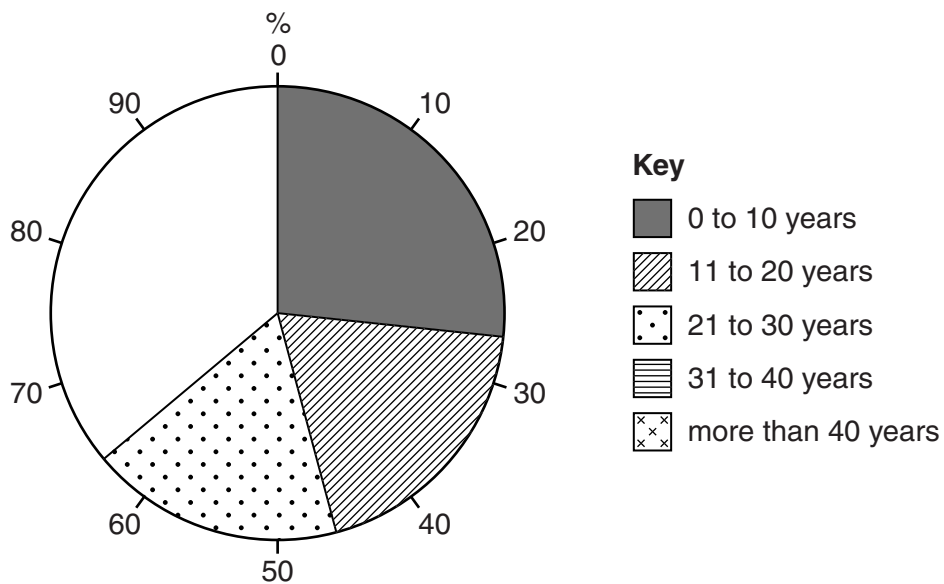
Fig. 6

(i) Use the results in Table 3 to complete the pie chart, Fig. 6, above. [2]

(ii) Which **one** of the following conclusions can be made from the results shown in Fig. 6? Put a tick (✓) to show your answer.

	✓
Most people have lived in the village for more than 40 years.	
Most people have lived in the village for more than 20 years.	
Most people have lived in the village for 10 years or less.	

[1]

(iii) The results of Question 2 are shown in Table 4, below.

Table 4

Results of Question 2: Where did you live before moving to the village?

Previous location	Percentage of residents
Moved from towns more than 10 km away	34
Moved from villages more than 10 km away	8
Moved from outside the UK	2
Moved from nearby towns less than 10 km away	25
Moved from local villages less than 10 km away	15
Always lived in the village	16

Results of Question 2

Where did you live before moving to the village?

percentage of residents
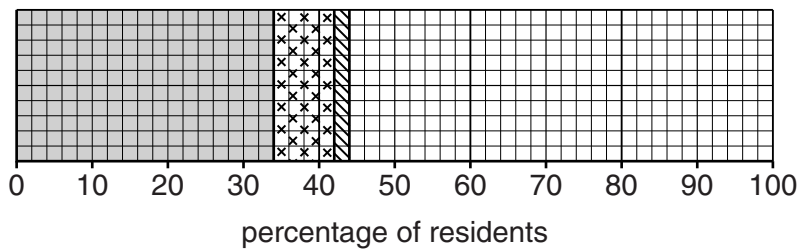
Key

Moved from:

towns more than 10 km away

villages more than 10 km away

outside the UK

nearby towns less than 10 km away

local villages less than 10 km away

always lived in the village

Fig. 7

Use the results from Table 4 to complete the divided bar graph, Fig. 7, above. [3]

(iv) The students used the information in Fig. 7 to work out a conclusion to **Hypothesis 1**:
Most people who moved to live in the village came from less than 10 km away.
Do you think the hypothesis is correct? Support your conclusion with evidence from Table 4 and Fig. 7.

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.... [3]

(v) The results of Question 3 in the questionnaire are shown in Table 5 below.

Table 5

Results of Question 3: What is the main reason you live in the village?

Reason	Percentage of residents
Easy access to work in the nearby town	38
Retired and moved to the village	25
Born in the village	16
Work in the village	15
Enjoy the peaceful location	4
Surrounded by attractive scenery	2

Under which reason in Table 5 would the following answers be included?

1   I have always lived in the village.

Reason ....

2   The views down the river valley are spectacular.

Reason ....

3   The village is only 5 km from the shop where I work and I can get there by bus.

Reason .... [3]

(vi) What conclusion would the students make about **Hypothesis 2**: *The main reason why people live in the village is because their work is in the village or nearby?*
Refer to data in Table 5 to explain your answer.

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.... [3]

(c) The students also researched secondary data from the local census records.

(i) Explain what is meant by *secondary data*.

....

.... [1]

(ii) Give **one** example, other than census records, of secondary data.

.... [1]

(iii) The secondary data researched by the students is shown in Table 6 below.
Name an appropriate type of graph to show this data.

.... [1]

Table 6

Population of the village 1961 – 2011

Year	1961	1971	1981	1991	2001	2011
Population	785	743	1161	1342	1596	2142

(iv) The students used the figures in Table 6 to calculate the percentage change in population which occurred in the village during each 10 year period. These changes are shown in Table 7, below.

Table 7

Percentage change in population in each 10 year period

10 year period	1961–1971	1971–1981	1981–1991	1991–2001	2001–2011
Percentage change	–5.4	+56.3	+15.6	+18.9	+34.2

Use these figures to complete Fig. 8 below. [2]

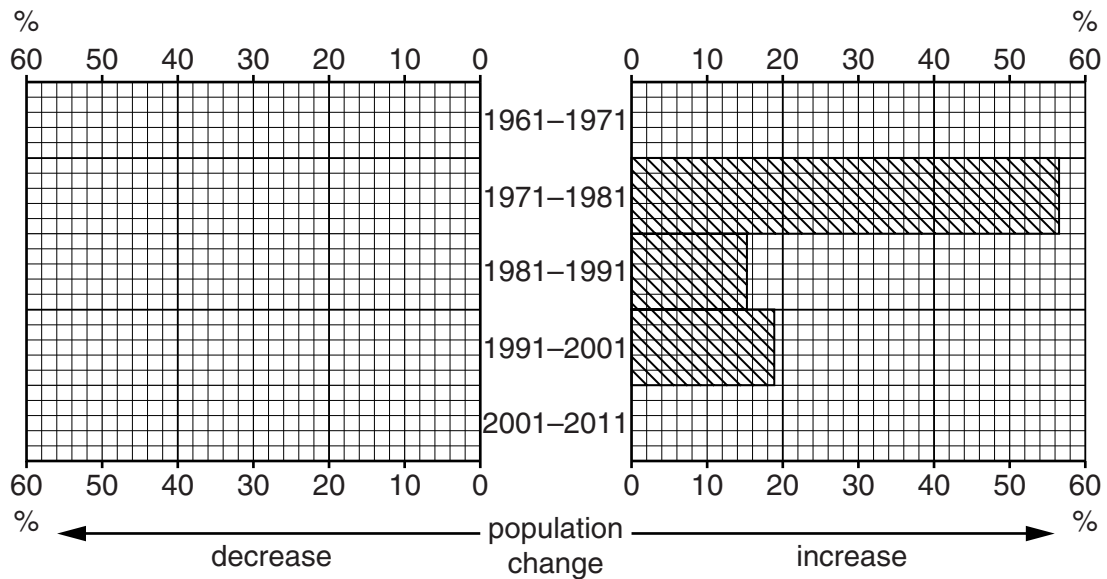**Population change in each 10 year period**

Fig. 8

(v) When studying the population figures the students realised that the village was growing quickly in size and population. Suggest **two** problems that this growth might cause for local people and **two** problems it might cause for the local environment.

Local people

1 ....

....

2 ....

....

Local environment

1 ....

....

2 ....

.... [4]

(d) The students obtained a land use map of the village produced in 1970. Describe how they could use the map and carry out fieldwork to show changes to the village between 1970 and 2011.

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.... [3]

[Total: 30 marks]

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