Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9577941546

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2021**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed) Ruler
Calculator
Protractor

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined pages at the end of this booklet; the question number or numbers must be clearly shown.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [ ].
- The insert contains additional resources referred to in the questions.

This document has **16** pages. Any blank pages are indicated.

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1 Students did fieldwork at three sites along Debden Brook. Debden Brook is a tributary stream in the drainage basin of the River Thames in south east England.

(a) (i) What is a *tributary* stream?

.....

..... [1]

(ii) What is a *drainage basin*?

.....

..... [1]

(b) Before they began to work in small groups, the class of students did a pilot study at a site on the river.

Identify **two** advantages of doing a pilot study from the table below. Tick (✓) your choices.

	tick (✓)
draw a sketch map of the river's course	
get to know other students before they begin fieldwork	
learn how to use equipment	
look at how the river changes downstream	
practise fieldwork techniques	

[2]

The students agreed to investigate the following hypotheses:

Hypothesis 1: *River discharge increases downstream.*

Hypothesis 2: *The gradient of the river bed decreases downstream.*

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(c) To calculate river discharge the students needed to find out the velocity of the river and the width and depth of the channel.

(i) First, they measured velocity at three places across the channel at each site using the method shown in Fig. 1.1 (Insert). Describe how they measured velocity.

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..... [4]

(ii) The students' velocity measurements are shown in Table 1.1 (Insert). Suggest **two** reasons why the method the students used may have produced unreliable results.

1 .....

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2 .....

..... [2]

(d) (i) The students measured the width of the river channel and the depth of the river at three points across the channel. Their method is shown in Fig. 1.2 (Insert). Describe how the students made these measurements.

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..... [4]

(ii) Using their results the students drew a cross-section of the river channel at each site. The cross-sections at sites 1 and 3 are shown in Fig. 1.3 below.
Use the results in Table 1.2 below to **draw the cross-section at site 2** in Fig. 1.3. [3]

Table 1.2

distance across channel (m)	depth (m)
0.5	0.36
1.0	0.25
1.5	0.07

River cross-sections

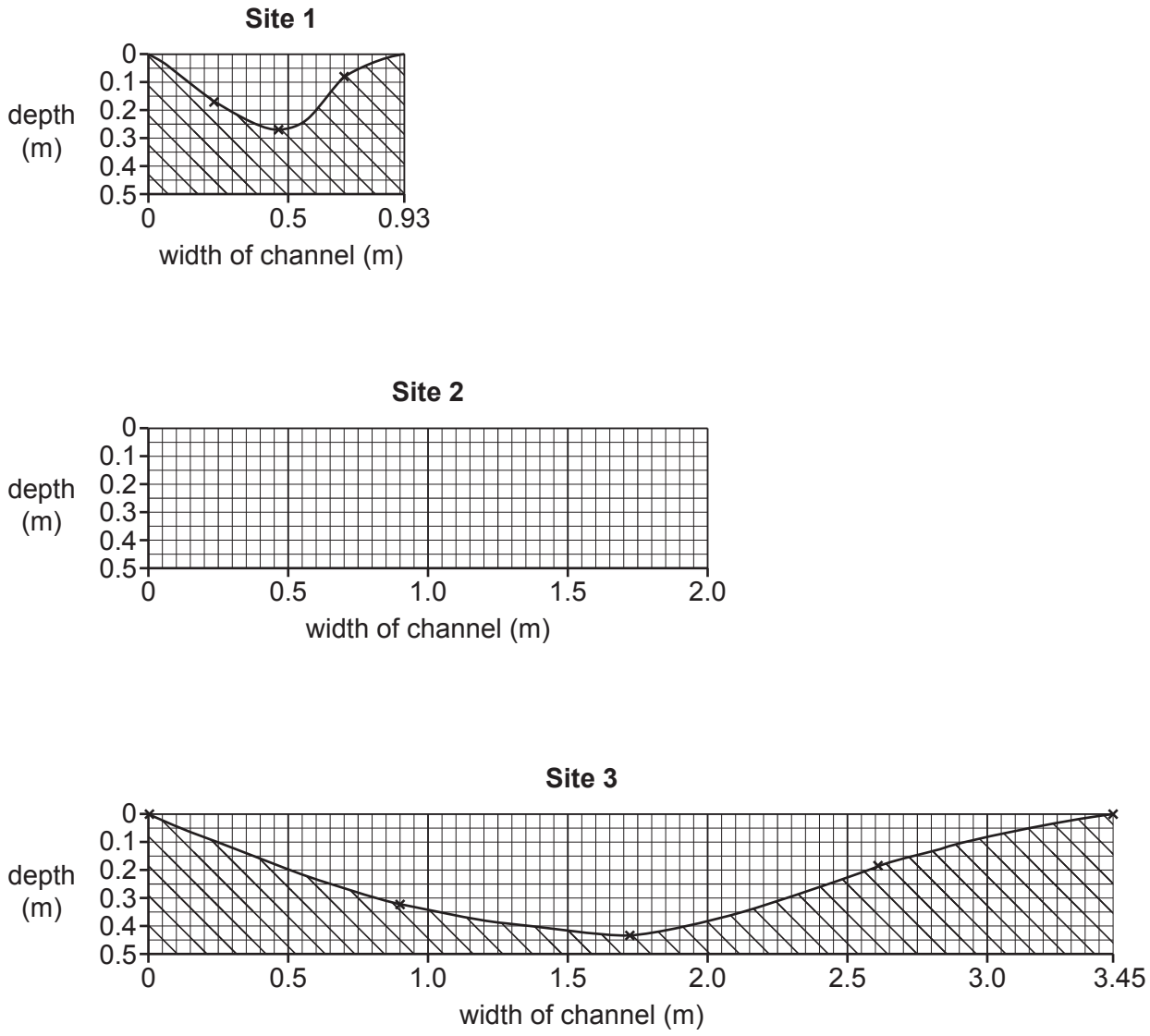


Fig. 1.3

(e) The students then calculated the cross-sectional area of the river channel at each site.

(i) Use the data in Table 1.3 (Insert) to **work out the cross-sectional area** of site 3 in the box below. [2]

Calculation of cross-sectional area at site 3

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

=

= m^2

(ii) Using their data the students calculated the river discharge at each site. Discharge is calculated by the formula:

average velocity × cross-sectional area

Their results are shown in Table 1.4 below.

Table 1.4

	site	discharge (cumecs)
upstream	1	0.12
↕	2	0.29
downstream	3	0.48

What is the correct conclusion to **Hypothesis 1:** *River discharge increases downstream*? Use evidence from Table 1.4 to support your conclusion.

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.....

..... [2]

(iii) Give **one** reason why river discharge changes downstream.

.....

..... [1]

(f) To test **Hypothesis 2:** *The gradient of the river bed decreases downstream*, the students measured the angle of slope of the river bed at each site.

(i) Describe how the students measured the angle of slope of the river bed.

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..... [4]

(ii) The results of their measurements are shown in Table 1.5 (Insert).
The students plotted the results for each site on a graph, Fig. 1.4 below.
Plot the average angle for site 3 on Fig. 1.4. [1]

Results of students' measurements of gradient

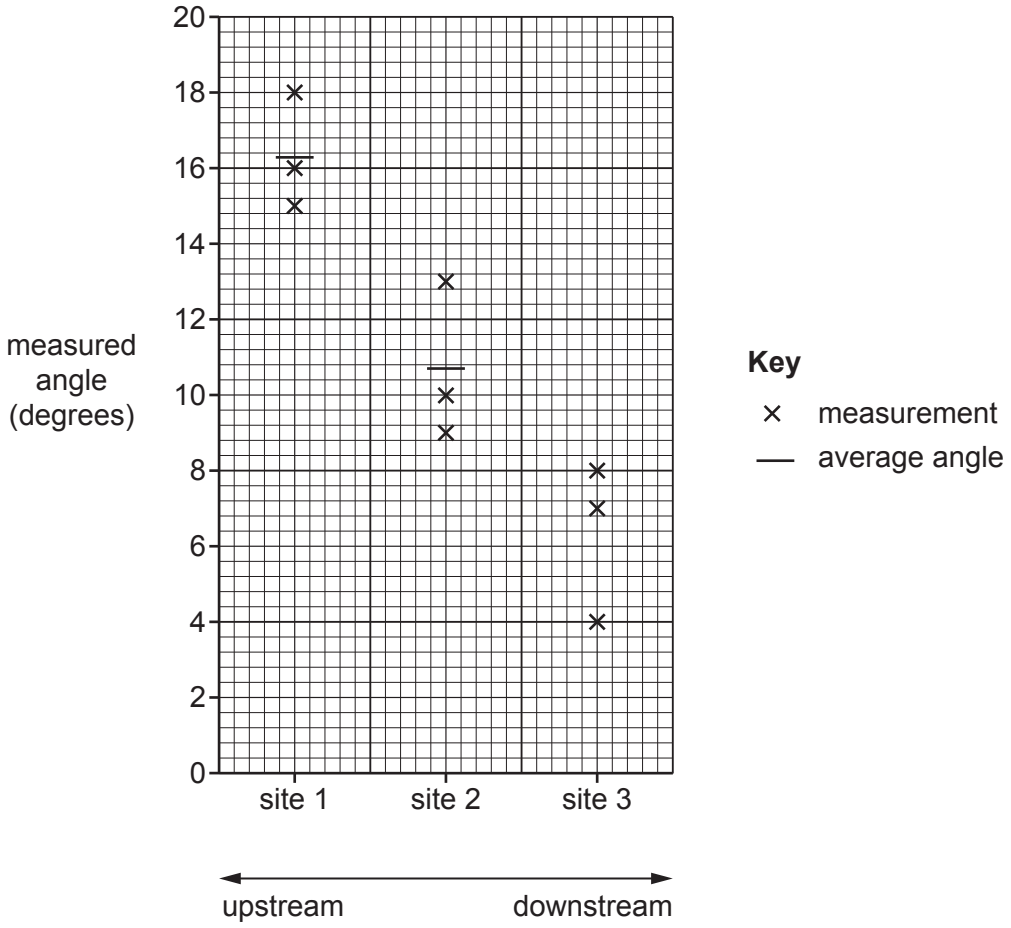


Fig. 1.4

(iii) Do the results shown in Fig. 1.4 and Table 1.5 (Insert) support **Hypothesis 2:** *The gradient of the river bed decreases downstream*? Use data to support your conclusion.

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..... [3]

[Total: 30]

2 Geography students at two schools in different parts of the UK wanted to compare farming in the two areas. They planned a fieldwork investigation using internet links between the two schools. They wanted to compare land use, and inputs and outputs on two local farms. The farms are shown in Fig. 2.1 (Insert).

The students agreed to investigate the following hypotheses:

Hypothesis 1: *The physical geography of the local areas affects land use on the farms.*

Physical geography includes climate, relief and soils.

Hypothesis 2: *The two farming systems have the same input costs and the same outputs.*

(a) The students in both areas researched information about the local area.

(i) Information about climate is shown in Table 2.1 (Insert). How is climate data different from weather data which students might collect?

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.....

..... [2]

(ii) The students also researched information about other physical characteristics of their local farms. These are shown in Table 2.2, below. **Put the following characteristics into the table below.** [1]

gradient altitude (height above sea level) soil type

Table 2.2

characteristic	Bryn Du farm	Home Park farm
.....	loam and clay	organic peat
.....	180–360 metres	0–10 metres
.....	sloping hillside	flat land

(b) The students visited the two farms and were given maps which showed the main field boundaries. The students were then given permission to investigate and draw a map to show the different ways that the land was being used. The students' sketch maps are shown in Figs. 2.2 and 2.3 (Insert).

(i) Compare the land use and field size above and below 200 m on Bryn Du farm shown in Fig. 2.2.

Land use

.....

.....

Field size

.....

..... [2]

(ii) In how many fields is wheat grown on Home Park farm as shown in Fig. 2.3?

..... [1]

(iii) Describe the shape of the fields on Home Park farm.

.....

..... [1]

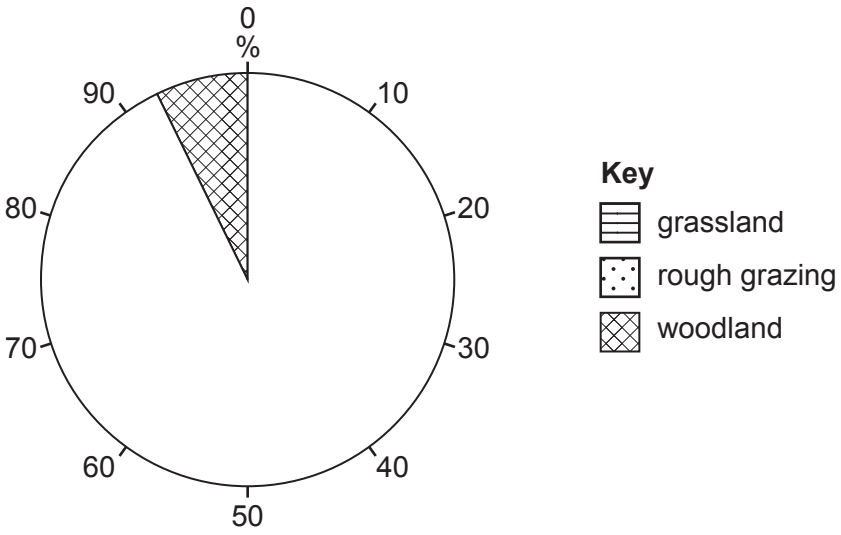
(iv) Use Figs. 2.1, 2.2 and 2.3 (Insert) to compare the two farms in the table below. Put **one** tick (✓) for each farming type. [2]

farming type	Bryn Du farm	Home Park farm
arable		
pastoral		
lowland		
upland		

(c) The students obtained some secondary data from the farmers about how they used the land. This is shown in Table 2.3 (Insert).

(i) Use the data from Table 2.3 to **complete the pie graph** for Bryn Du farm in Fig. 2.4 below. [2]

Land use on Bryn Du farm



Land use on Home Park farm

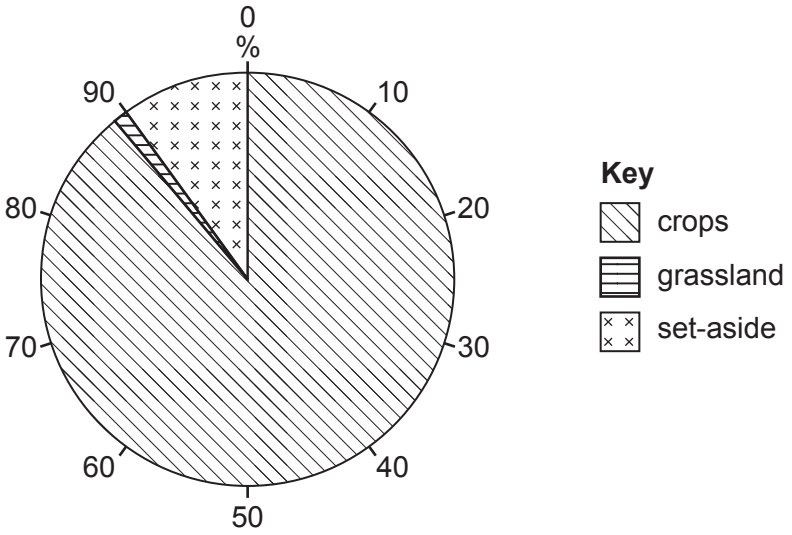


Fig. 2.4

(ii) The students in both schools agreed that **Hypothesis 1:** *The physical geography of the local areas affects land use on the farms* was **true**. Support this conclusion by reference to Tables 2.1, 2.2 and the results of the students' fieldwork in Table 2.3 and Figs. 2.2, 2.3 and 2.4.

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..... [4]

(iii) Suggest why land use on the two farms is affected by physical geography (climate, relief and soils).

Climate

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Relief

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.....

Soils

.....

..... [3]

(d) To investigate **Hypothesis 2:** *The two farming systems have the same input costs and the same outputs*, the students researched the main inputs and outputs of both farms.

(i) Their information about the cost of inputs in the farms is shown in Table 2.4 (Insert). Use the data to **plot the cost of labour and machinery** on Bryn Du farm on Fig. 2.5 below. [2]

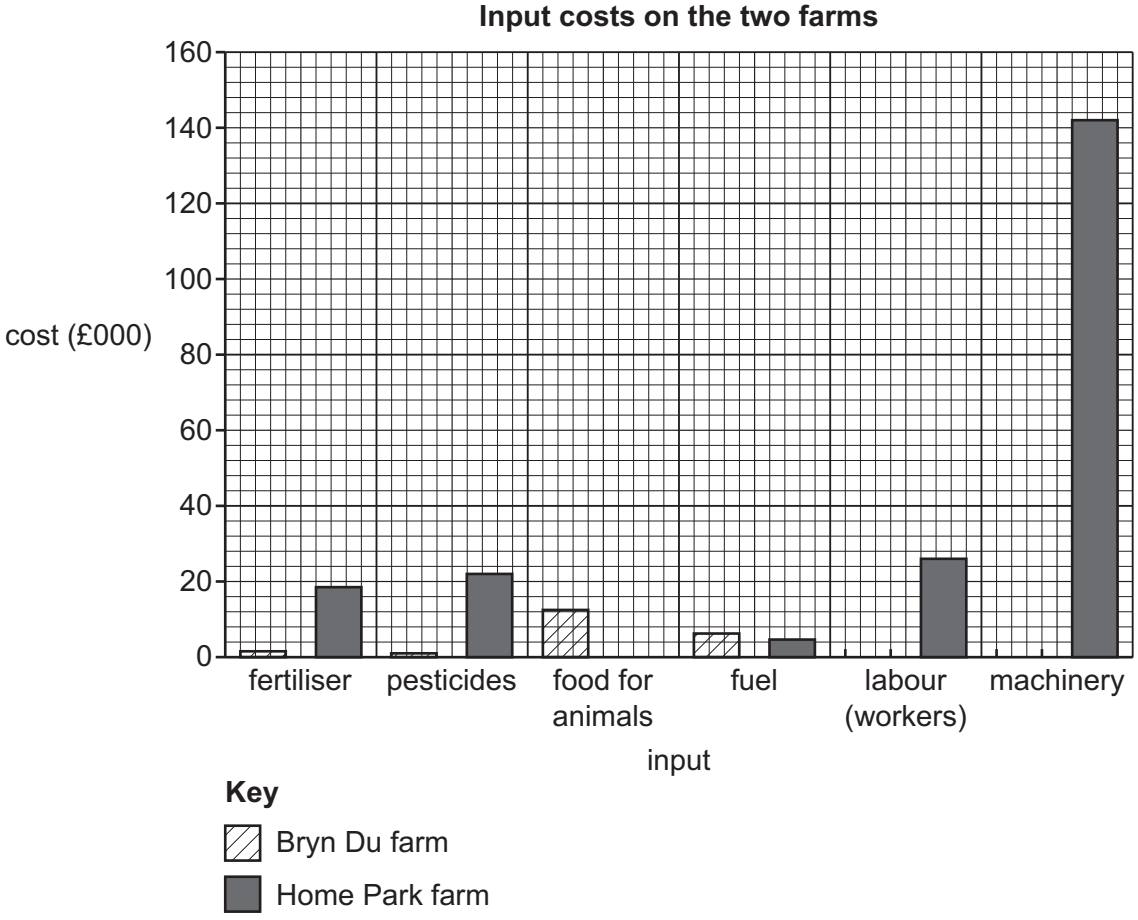


Fig. 2.5

(ii) Their information about outputs from the farms is shown in Table 2.5 (Insert). Why would the students be unable to plot this information on one bar graph?

.....

..... [1]

(iii) What conclusion would the students make about **Hypothesis 2:** *The two farming systems have the same input costs and the same outputs*? Support your decision with evidence from Tables 2.4 and 2.5.

.....

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..... [3]

(e) To extend their fieldwork the students wanted to find out more about the processes which took place on the farms during the year. Suggest **three** ways they could do this.

1 .....

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2 .....

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3 .....

..... [3]

(f) The students learned in class that mixed farming was important in the UK.
Describe **three** advantages of a mixed farming system.

1 .....

.....

2 .....

.....

3 .....

..... [3]

[Total: 30]

Additional Pages

If you use the following lined pages to complete the answer(s) to any question(s), the question number(s) must be clearly shown.

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