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**GEOGRAPHY**

**0460/42**

Paper 4 Alternative to Coursework

**October/November 2016**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

Additional Materials:      Calculator  
   Protractor  
   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 an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Write your answer to each question in the space provided.

If additional space is required, you should use the lined pages at the end of the booklet.

The question number(s) must be clearly shown.

Answer **all** questions.

The Insert contains Figs. 1 and 5 and Table 2 for Question 1, Figs. 6 and 10 and Tables 4 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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages, **3** blank pages and **1** Insert.

1 Some students did fieldwork in a small river drainage basin in south west England. The students chose four sites which are shown on Fig. 1 (Insert).

(a) Which **two** features of the drainage basin are labelled **A** and **B** on Fig. 1?

Choose from the following:

confluence      meander      source      tributary      watershed

Feature **A** .....

Feature **B** ..... [2]

The students decided to investigate the following hypotheses:

**Hypothesis 1:** *River discharge increases downstream.*

**Hypothesis 2:** *River pollution increases downstream.*

(b) In order to calculate river discharge the students had to measure river velocity and channel width and depth.

(i) First they measured velocity once at each site using floats, a tape measure and a stopwatch. Describe how they measured velocity.

.....  
.....  
.....  
.....  
.....  
.....  
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.....  
.....  
.....[4]

(ii) When the students returned to school they discussed with their teacher possible weaknesses of their method for measuring velocity. Give **two** weaknesses of the method.

1 .....

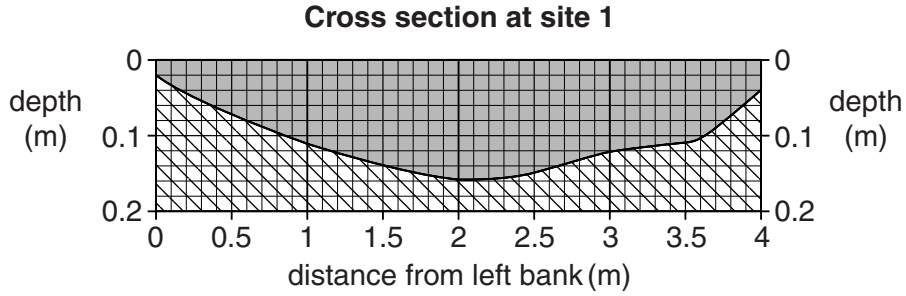
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2 .....

.....[2]



- (iv) Using their measurements the students drew a cross section of the river channel at each site. The cross section at site 1 is shown in Fig. 2 below.



**Fig. 2**

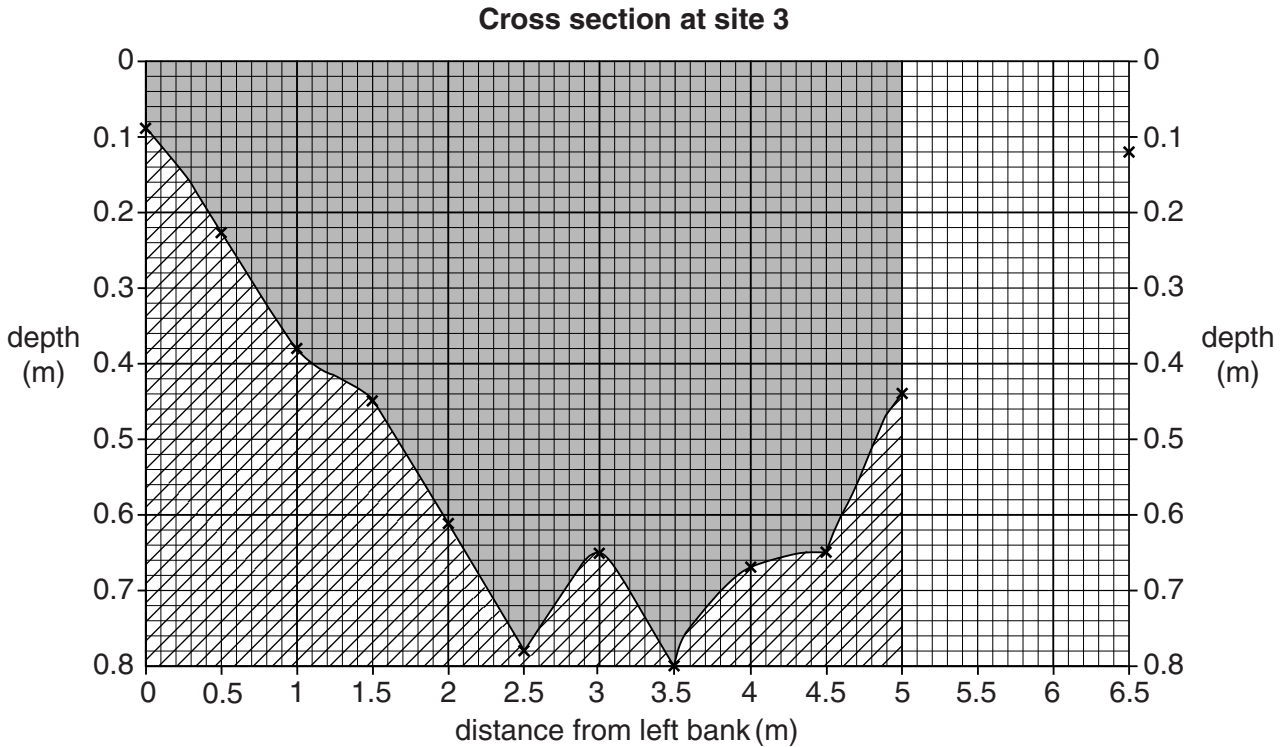
The results of the students' measurements at site 3 are shown in Table 1 below.

**Table 1**

**Site 3 measurements**

Distance from left bank (m)	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	<b>5.5</b>	<b>6.0</b>	6.5
Depth (m)	0.09	0.23	0.38	0.45	0.61	0.78	0.65	0.80	0.67	0.65	0.44	<b>0.38</b>	<b>0.21</b>	0.12

Use the results shown in Table 1 to complete the cross section and complete the shading of the river channel at site 3 in Fig. 3 below. [2]



**Fig. 3**

- (v) Describe **two** differences between the cross sections at site 1 and site 3.

1 .....

.....

2 .....

..... [2]

- (vi) The students then calculated the cross sectional area of the river channel at each site. First they had to calculate the average depth of the river.

Table 1, on page 4, shows the water depth at the 14 measuring points across the river at site 3. Calculate the average depth at this site.

..... m [1]

- (vii) Use the data in Table 1 and your calculation in (b)(vi) to work out the cross sectional area of site 3 below. [2]

Calculation of cross sectional area at site 3

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

=

= m<sup>2</sup>

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

$$\text{velocity} \times \text{cross sectional area}$$

Their results are shown in Table 2 (Insert). Use these results to complete the graph, Fig. 4 below. [1]

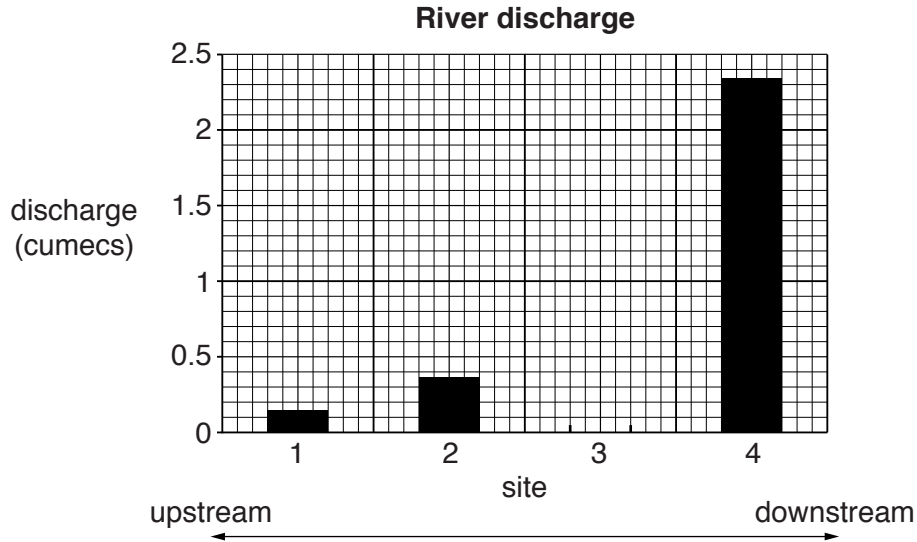


Fig. 4

- (ii) What conclusion should the students make about **Hypothesis 1**: *River discharge increases downstream*? Use evidence from Fig. 4 to support the conclusion.

.....

.....

.....

.....[2]

- (iii) Look again at Fig. 1 (Insert) and explain the change in discharge downstream.

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.....

.....

.....[2]

- (d) To test **Hypothesis 2: River pollution increases downstream**, a different student at each site did a visual survey using the recording form shown in Fig. 5 (Insert).
- (i) Fig. 5 shows the completed form for site 3. Use this information to calculate the overall pollution score. Put your answer into Table 3 below. [1]

**Table 3**

Site	Pollution score
1	5
2	3
3	
4	17

- (ii) What conclusion would the students make about **Hypothesis 2: River pollution increases downstream**? Support your answer with evidence from Table 3.
- .....
- .....
- .....
- .....
- .....
- .....
- .....[3]

- (iii) Suggest **two** ways that the students could improve the reliability of their pollution survey.
- 1 .....
- .....
- 2 .....
- .....[2]

[Total: 30 marks]

- 2 Students in Cascais, Portugal were investigating differences in their local shopping area. They did fieldwork in three shopping areas:
- the CBD of the town;
  - a suburban (neighbourhood) shopping centre located 3 km away from the CBD;
  - an out-of-town shopping mall located 10 km from the CBD.

Some students decided to test the following hypotheses:

**Hypothesis 1:** *There will be differences between the types of shops and services located in the three shopping areas.*

**Hypothesis 2:** *The number of people who are shopping will decrease further away from the CBD.*

(a) To investigate **Hypothesis 1** the students completed a tally chart of the different types of shops and services in each area. Their completed tally chart for the suburban (neighbourhood) shopping centre is shown in Fig. 6 (Insert).

(i) The number of shops and services counted in the CBD and the out-of-town mall is shown in Table 4 (Insert).

A student wanted to plot all the results from the three shopping centres onto separate pie charts so that she could compare them. Explain why it would be difficult to do this.

.....

.....

.....

.....[2]



- (ii) To make it easier to reach a conclusion to **Hypothesis 1** the student decided to classify the shops and services into five groups shown in Table 5 below.

**Table 5**

**Classification of shops**

Group	Description
<b>A</b>	Shops which sell mainly one type of product which are often expensive
<b>B</b>	Shops which sell a variety of products which are often cheaper
<b>C</b>	Shops which sell mainly food
<b>D</b>	Shops which sell mainly clothes
<b>E</b>	Services

In which group would the student have included:

- a hair and beauty salon; .....
- a jewellers? .....

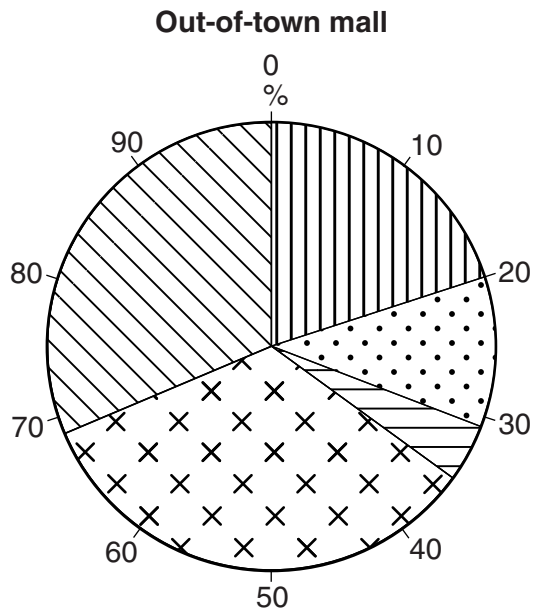
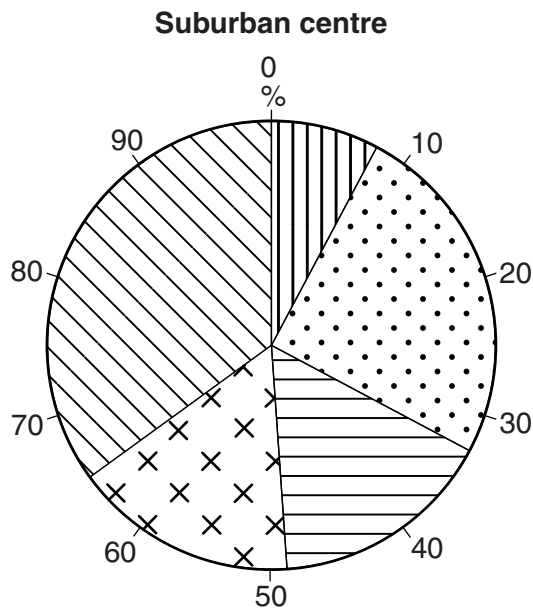
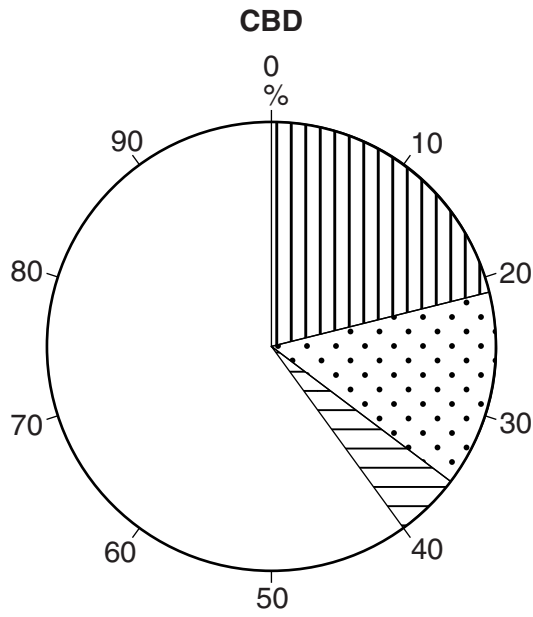
[2]

- (iii) Which **one** of the following describes the shops in group **A**?






Circle your answer.

business      comparison      convenience      department      public      [1]

(iv) The results of the student's classification are shown in Table 6 (Insert). Use these results to complete the pie graph for the CBD in Fig. 7 below. [2]



**Key**

-  Group A – shops which sell mainly one type of product which are often expensive
-  Group B – shops which sell a variety of products which are often cheaper
-  Group C – shops which sell mainly food
-  Group D – shops which sell mainly clothes
-  Group E – services

**Fig. 7**



- (b) To investigate **Hypothesis 2**: *The number of people who are shopping will decrease further away from the CBD*, the students did a pedestrian count in each shopping area.
- (i) Describe how the students would plan and carry out the pedestrian count so that they would get reliable results.

Plan the pedestrian count

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Carry out the pedestrian count

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[4]



(iv) Fig. 9 below is an extract from a student’s fieldwork diary.

**Fieldwork diary**

**Monday 2<sup>nd</sup> February 2014**  
AM: Heavy rain. Pedestrian count in CBD at 09.00  
  
Midday: Light rain. Pedestrian count at suburban shopping centre at 12.00  
  
PM: Bright and sunny: Pedestrian count at out-of-town centre at 17.00

**Fig. 9**

How might the factors described by the student affect the results of the pedestrian count?

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.....[2]

(v) To check their results the students found on the school website some data which had been collected by students in 2008, 2010 and 2012. This data is shown in Fig. 10 (Insert) alongside the students’ own fieldwork results collected in 2014. Why is this earlier data called *secondary* evidence?

.....  
.....[1]

(vi) How does the secondary evidence in Fig. 10 support the students’ conclusion that **Hypothesis 2**: *The number of people who are shopping will decrease further away from the CBD* is partly true?

.....  
.....[1]

(c) As an extension task two students wanted to investigate the sphere of influence of the CBD.

(i) Which **one** of the following is the correct definition of *sphere of influence*?

Tick your choice in the table below.

Definition	Tick (✓)
area where people have migrated to	
area where people go to work in the town centre	
area around a town centre	
area next to a shop or service	
area served by a settlement or service	

[1]

(ii) Describe a method the students could carry out to investigate the sphere of influence of the CBD.

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[4]

[Total: 30 marks]











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