| CANDIDATE NAME | |
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| CENTRE NUMBER | | | | | | CANDIDATE NUMBER | | | | |
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**GEOGRAPHY** **0460/41**

Paper 4  Alternative to Coursework **October/November 2010**

**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 ON ANY BARCODES.

Answer **all** questions.
The Insert contains Figs 1 and 3 and Tables 2 and 3 for Question 1 and Figs 5 and 6 and Tables 4, 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 **12** printed pages and **1** Insert.

**[Turn over**

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**1** Students wanted to investigate the possible impacts of tourism on a village visited by many people. They wanted to find out if there were both positive and negative effects.
To do this they decided to test the following hypotheses:

**Hypothesis 1** *Tourism has a major impact on the shops and services in the village*

**Hypothesis 2** *The impact of tourism decreases away from the main car park*

**(a)** To investigate the importance of tourism, the students mapped different types of shops and services, as shown on Fig. 1 (Insert), to see if they were mainly used by tourists or local people.

**(i)** How many hotels are shown on Fig. 1?

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

**Table 1**

**Details of shops and services**

| Type of shop or service | Tally | Total | Percentage of total number of shops |
|---|---|---|---|
| Art Gallery | / | 1 | 2.5 |
| Baker | / | 1 | 2.5 |
| Bank | / | 1 | 2.5 |
| Book shop | /// | 3 | 7.5 |
| Butcher | / | 1 | 2.5 |
| Café | //// | 4 | 10.0 |
| Chemist | / | 1 | 2.5 |
| Flower shop | // | 2 | 5.0 |
| Food store | /// | 3 | 7.5 |
| **Gift shop** | ⫫ /// | **8** | |
| Hairdresser | / | 1 | 2.5 |
| Museum shop | / | 1 | 2.5 |
| Post Office | / | 1 | 2.5 |
| Public House | /// | 3 | 7.5 |
| **Restaurant** | | | 10.0 |
| Sweet shop | // | 2 | 5.0 |
| Food Take Away | // | 2 | 5.0 |
| Tourist Information | / | 1 | 2.5 |
| **Total** | | **40** | **100** |

**(ii)** Look at Fig. 1 and complete the tally and total number of restaurants on Table 1. [1]

**(iii)** Calculate and write in the missing percentage for gift shops on Table 1. [1]

**(b)** To test **Hypothesis 1**, the students classified the shops and services into three groups just by looking at them:

- Used mainly by tourists;
- Used mainly by local residents;
- Used by both tourists and local residents.

The results of the decisions the students made about this classification are shown on Table 2 (Insert).

**(i)** Why would the students have found it difficult to classify some shops and services?

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**(ii)** How could the students be more certain that the customers of each shop were tourists or local residents?

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**(iii)** Use the results in Table 2 (Insert) to complete the pie graph shown in Fig. 2. [2]

**Pie graph of classification of shops and services**



number of shops
and services

**Key**

used mainly by tourists

used mainly by local residents

used both by tourists
and local residents
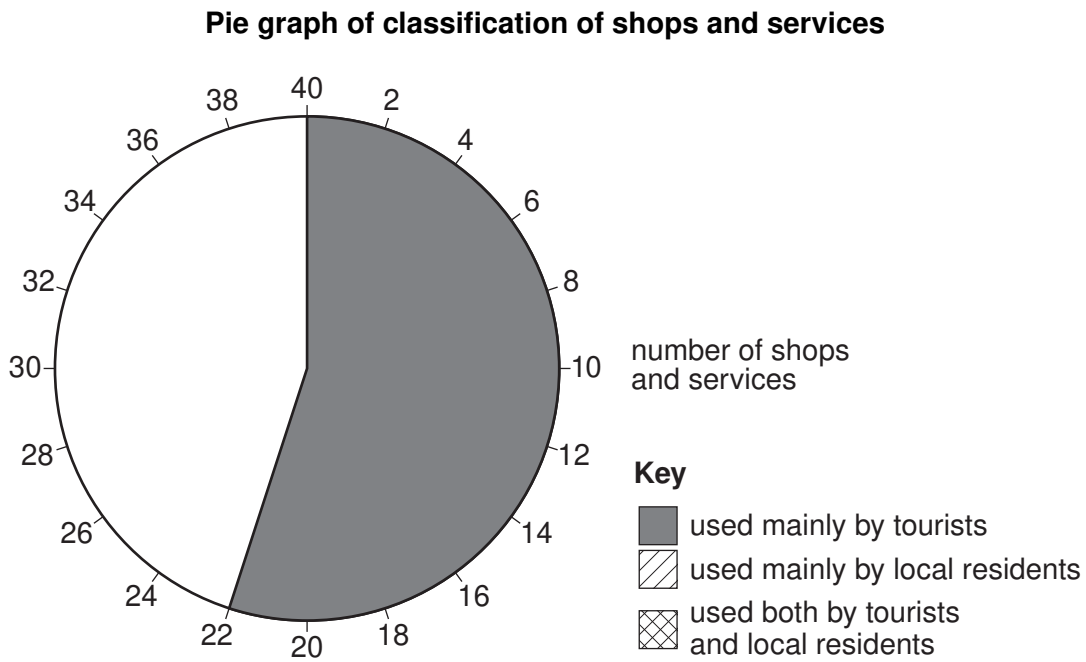
**Fig. 2**

**(iv)** The students accepted **Hypothesis 1** that tourism has a major impact on the shops
and services in the village.
Do you agree with them? Support your answer with evidence from Table 1 and
Fig. 2.

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**(c)** Next the students tested **Hypothesis 2** *The impact of tourism decreases away from the main car park.*
They devised a scoring system to measure the impacts of tourism at four survey sites in the village. These survey sites are labelled **A** to **D** on Fig. 1 (Insert).
Fig. 3 (Insert) shows the final scoring sheet after the students completed a pilot study.

   **(i)** What is a pilot study and why is it important in an investigation?

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   **(ii)** What decisions would the students have to make in organising and carrying out the main survey?

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**(d)** The results of the main survey of the impacts of tourism are shown on Table 3 (Insert).

**(i)** Complete Fig. 4, below, by plotting the results for tourist buildings for sites **B** and **D** from information given in Table 3.

**Results of the survey of the impacts of tourism**

**Site A**

| | -2 | -1 | 0 | +1 | +2 | |
|---|---|---|---|---|---|---|
| lots of litter | | | | | | no litter |
| noisy | | | | | | quiet |
| crowded | | | | | | few people |
| many tourist signs and adverts | | | | | | no tourist signs and adverts |
| lots of tourist buildings | | | | | | no tourist buildings |

**Site B**

| | -2 | -1 | 0 | +1 | +2 | |
|---|---|---|---|---|---|---|
| lots of litter | | | | | | no litter |
| noisy | | | | | | quiet |
| crowded | | | | | | few people |
| many tourist signs and adverts | | | | | | no tourist signs and adverts |
| lots of tourist buildings | | | | | | no tourist buildings |

**Site C**

| | -2 | -1 | 0 | +1 | +2 | |
|---|---|---|---|---|---|---|
| lots of litter | | | | | | no litter |
| noisy | | | | | | quiet |
| crowded | | | | | | few people |
| many tourist signs and adverts | | | | | | no tourist signs and adverts |
| lots of tourist buildings | | | | | | no tourist buildings |

**Site D**

| | -2 | -1 | 0 | +1 | +2 | |
|---|---|---|---|---|---|---|
| lots of litter | | | | | | no litter |
| noisy | | | | | | quiet |
| crowded | | | | | | few people |
| many tourist signs and adverts | | | | | | no tourist signs and adverts |
| lots of tourist buildings | | | | | | no tourist buildings |

[2]

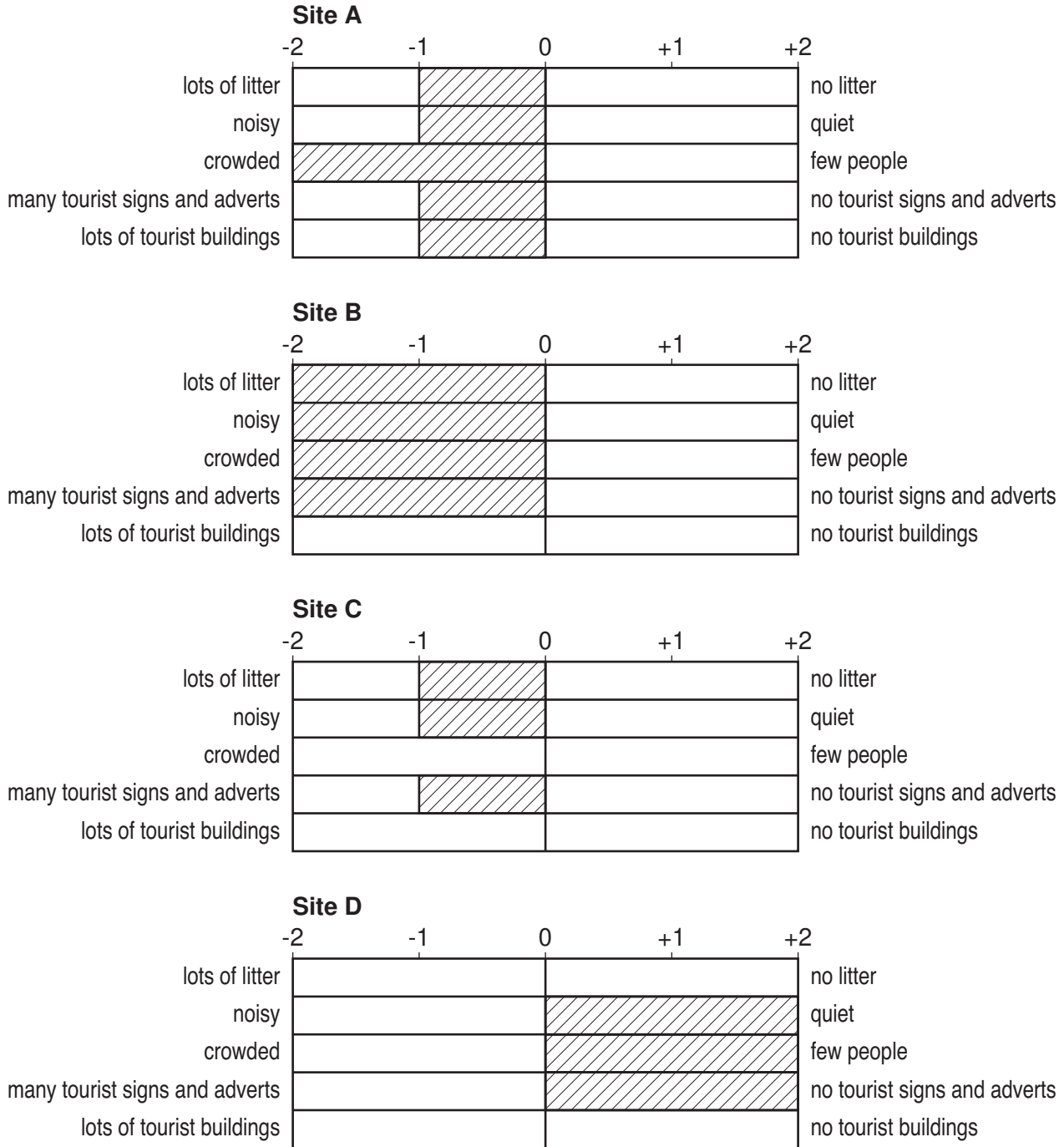**Fig. 4**

(ii) Identify **one** similarity and **one** difference between the results for sites **A** and **C**.

Similarity .................................................................................................................

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Difference .................................................................................................................

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(iii) To what extent do these results support **Hypothesis 2** that the impact of tourism decreases away from the main car park?

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(iv) Suggest reasons for the results of the survey of the impacts of tourism. Refer back to Fig. 1.

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(e) Suggest **one** other issue the students could have investigated in the village. Briefly describe how they could have done their investigation.

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[Total: 30 marks]

**2** Students were concerned about how human activities may threaten the environment by causing air pollution.

**(a) (i)** State **two** human activities which could cause air pollution.

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2 .....................................................................................................................[2]

**(ii)** Describe **three** effects of air pollution on the natural environment.

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The students decided to focus on one problem caused by air pollution – the impact of acid rain in their region. First they researched acid rain and made a fact file. This is shown on Fig. 5 (Insert).

The students decided to test the following hypotheses:

**Hypothesis 1** *The acidity of rainfall is affected by the direction of the wind*

**Hypothesis 2** *Rainfall is more acidic after a period of dry weather*

**(b)** Look at Fig. 6 (Insert) which is a sketch map of the area where the students live. What is meant by the term *prevailing wind*?

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**(c)** The students realised that this investigation would be long-term, so they agreed to do their investigation every day for four months. They set up a recording station in the grounds of their school. Each day they recorded the following:

- wind direction,
- amount of rain that had fallen in the previous 24 hours,
- pH value of any rainwater collected.

They recorded their results as a data log. Part of this log is shown on Table 4 (Insert).

**(i)** Describe how they collected their data. Refer to equipment used in your answer. The answer for pH has been done for you.

Wind direction ....................................................................................................

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Amount of rain that had fallen ...........................................................................

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pH  They used a pH meter or pH strips to measure the pH value of rainwater.    [2]

**(ii)** Why did the students decide to do their investigation over four months?

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**(iii)** What difficulties might the students have had in collecting their data, which may have affected their results?

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**(iv)** Using their data log, they produced the summary in Table 5 (Insert).
By studying this summary, what conclusion could the students make about
**Hypothesis 1** *The acidity of rainfall is affected by the direction of the wind*?
What evidence from Table 5 supports their conclusion?

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**(v)** Use information from Figs 5 and 6 (Insert) to explain why the level of acidity in
rainfall varies with wind direction.

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Next, the students looked at **Hypothesis 2** *Rainfall is more acidic after a period of dry
weather.*

**(d)** Using their data log again, the students produced the summary in Table 6 (Insert).

**(i)** Use the results recorded in bold in Table 6 to complete the scatter graph, Fig. 7
(opposite) and draw in a best-fit line. [3]

**(ii)** The students accepted **Hypothesis 2** *Rainfall is more acidic after a period of dry
weather*. Do you agree with them? Support your answer with evidence from Fig. 7.

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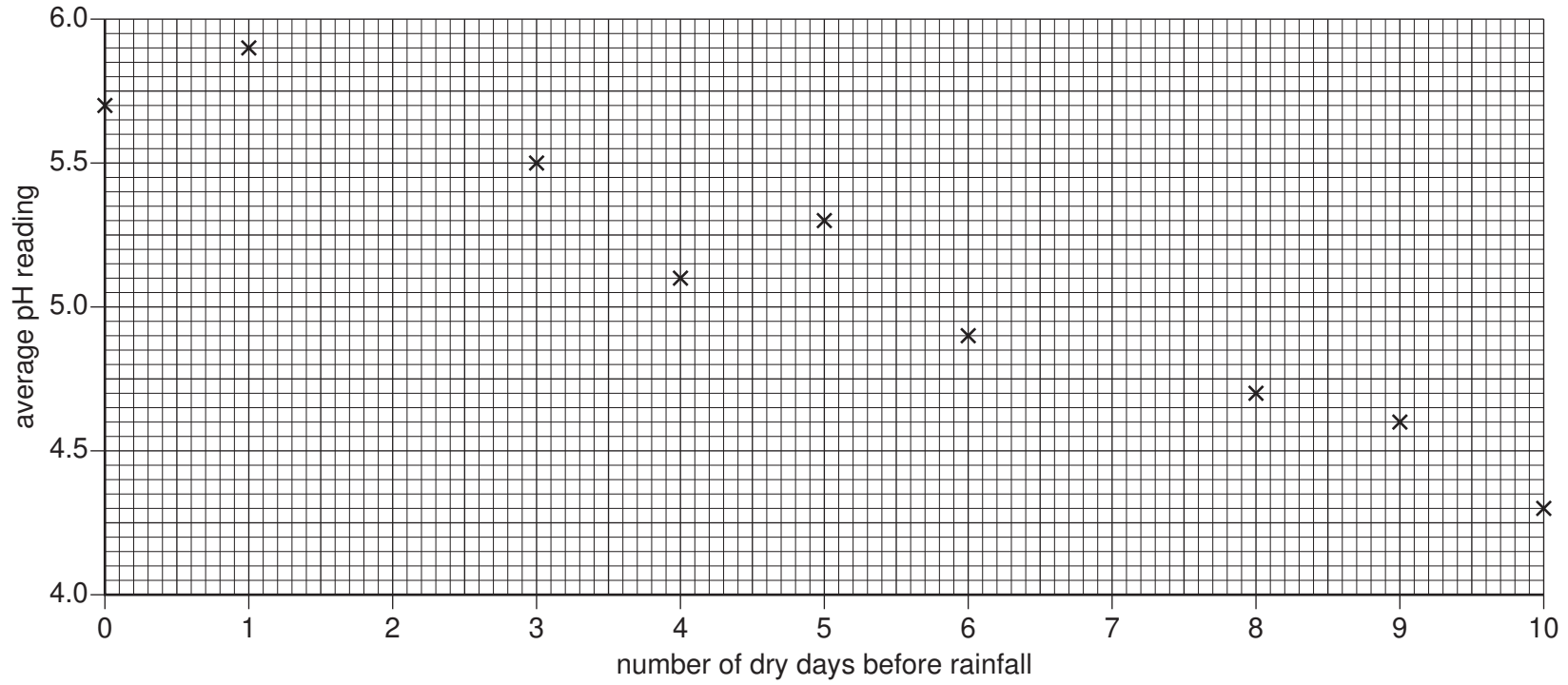**Relationship between number of dry days before rainfall and average pH reading**



**Fig. 7**

**(e) (i)** The students wanted to investigate the impact of another kind of pollution. Suggest a possible hypothesis about water pollution and describe appropriate data collection methods.

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**(ii)** Having completed their investigation of water pollution, what recommendations might the students have made to a water authority about how to reduce the level of pollution?

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[Total: 30 marks]