UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **October/November 2011**

1 hour 30 minutes

Candidates answer on the Question Paper

Additional Materials: Ruler

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
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 for Question 1, and Tables 3 and 4 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.

The number of marks is given in brackets [ ] at the end of each question or part question.

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

1 A group of students was investigating the characteristics of local streams and rivers. They decided to do fieldwork at three sites which are shown on Fig. 1 (Insert).

For Examiner's Use

The two hypotheses used by the students were:

Hypothesis 1: *Width, depth and wetted perimeter of the river channel increase downstream*.

Hypothesis 2: *There is a relationship between the size and the roundness of pebbles on the river bed.*

(a) Before beginning their fieldwork the students received advice from their teacher.

(i) Suggest **three** pieces of advice their teacher gave them to keep them safe whilst carrying out fieldwork.

1 .....

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2 .....

.....

3 .....

..... [3]

(ii) Give **two** reasons why their teacher suggested they might do a pilot study.

1 .....

.....

2 .....

..... [2]

(b) To investigate **Hypothesis 1**, the students made two measurements at each site. They measured the width of the river channel and the depth of the river at points across the channel.

Suggest what equipment they would use to measure the width of the channel and the depth of the river and how they would make the measurements.

Width of channel .....

.....

.....

.....

Depth of river .....

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..... [4]

(c) The results of their measurements are shown in Table 1, below.

Table 1

Channel measurements

		Depth of river at distances across the channel (m)											
Site	Width of channel (m)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	Wetted perimeter (m)
A	1.3	0.15	0.1											1.4
B	2.3	0.14	0.18	0.33	0.2									2.5
C	6.5	0.2	0.26	0.29	0.3	0.33	0.38	0.47	0.48	0.51	0.36	0.35	0.26	

[Turn over

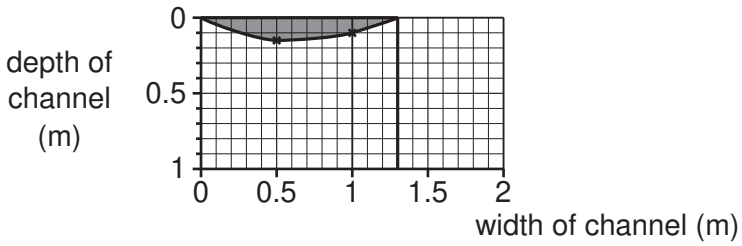
(i) Use the results in Table 1 to complete Fig. 2 below by:

- completing the cross-section of the channel at Site B;
- shading in the river channel at Site B. [3]

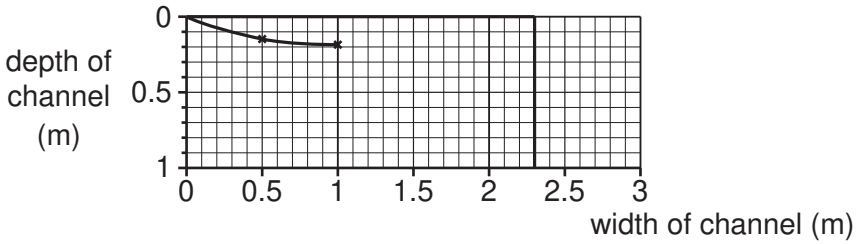
For Examiner's Use

Cross-section at sites A, B and C

Site A



Site B



Site C

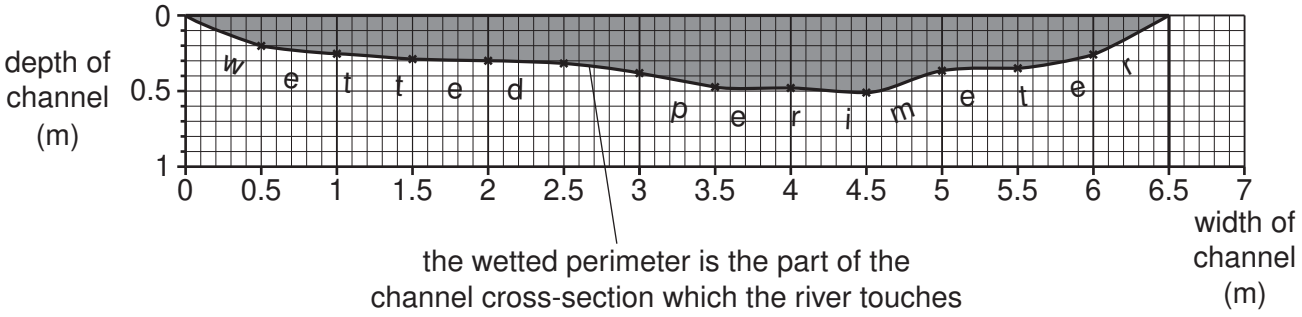


Fig. 2

(ii) The wetted perimeter (the part of the channel cross-section which the river touches) is labelled on Fig. 2 at Site C. Measure the length of the wetted perimeter at this site.

For Examiner's Use

…….. metres [2]

(iii) How and why will the speed of river flow be affected by contact with the river channel?

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..... [2]

(iv) The students made the conclusion that **Hypothesis 1**: *Width, depth and wetted perimeter of the river channel increase downstream* was correct.
How would you use their results to support this conclusion?

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..... [2]

(d) Next the students made some measurements to investigate **Hypothesis 2**:
There is a relationship between the size and the roundness of pebbles on the river bed.

For Examiner's Use

(i) At each site (A, B and C) a student selected 10 pebbles at random from the bed of the river. He then measured the size and roundness of the pebbles using the equipment shown in Fig. 3 (Insert). Suggest how he made the two measurements.

pebble size .....

.....

roundness of pebble .....

..... [2]

The results of the student's work are shown in Table 2 below.

Table 2

Site	A	B	C
Average (mean) pebble size (cm)	12	9	7.5
Average roundness score	2	3.5	4

(ii) Plot the average pebble size and roundness score for Site B on Fig. 4 below. [2]

Pebble Measurements

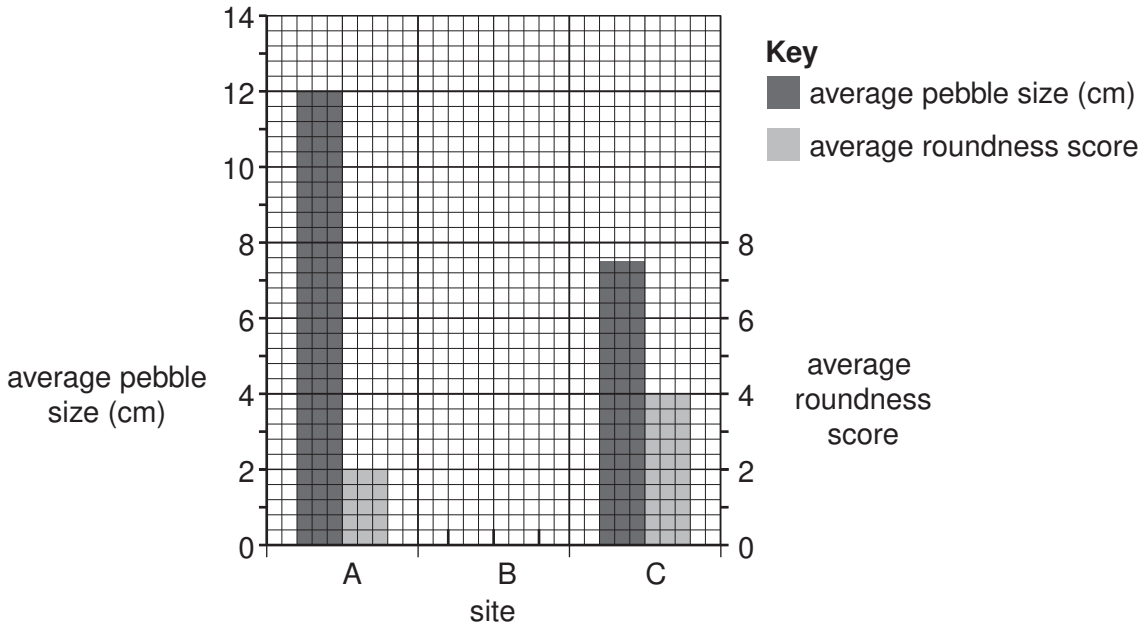

Fig. 4

For Examiner's Use

(iii) What conclusion would the students make about **Hypothesis 2:** *There is a relationship between the size and the roundness of pebbles on the river bed?*

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..... [2]

(iv) Suggest why pebble size and roundness change downstream.

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..... [2]

(e) Suggest **four** ways that the students could have improved their data collection methods to make their results for both hypotheses more reliable.

1.....

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2.....

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3.....

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4.....

..... [4]

[Total: 30 marks]

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2 A group of students was studying traffic flows in and out of the centre of a town. A map of the area being studied is shown in Fig. 5 below.

For Examiner's Use

Number of Vehicles at each site

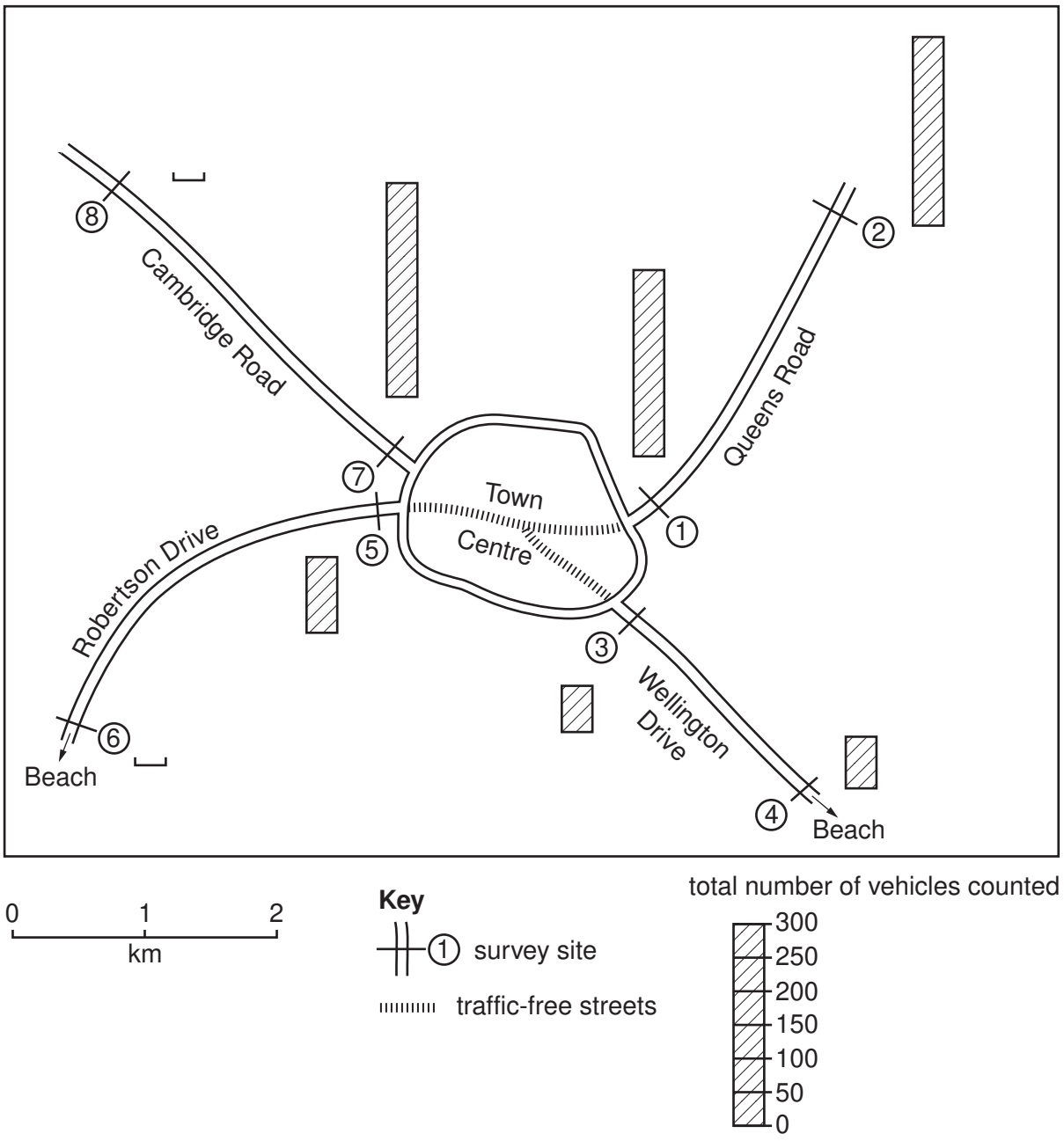

Fig. 5

The students wanted to investigate the following hypotheses:

Hypothesis 1: *The amount of traffic will be less further from the town centre.*

Hypothesis 2: *The amount of traffic going towards and going away from the town centre will change during the day.*

The students chose eight sites to do traffic surveys at 08.00 and 17.00. These are shown on Fig. 5.

For Examiner's Use

(a) (i) Suggest **four** things the students would need to do to plan for their traffic count.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

..... [4]

(ii) The students agreed to use a tally method to record vehicles passing each survey point. Give **two** reasons why this is a suitable recording method.

1 .....

.....

2 .....

..... [2]

(b) The results of the students' survey are shown in Table 3 (Insert).

(i) On which road were the two highest totals?

..... [1]

(ii) Use the data in Table 3 to draw bars on Fig. 5 (page 9) to show the **total** number of vehicles counted at sites 6 and 8. [2]

(iii) What would be the students' conclusion about **Hypothesis 1:** *The amount of traffic will be less further from the town centre?*

Support your decision with evidence from Fig. 5 and Table 3.

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..... [4]

(c) (i) To investigate **Hypothesis 2:** *The amount of traffic going towards and going away from the town centre will change during the day*, the students decided to use the results from **one** site on each of the four roads. These results are shown in Table 4 (Insert).

Look at Tables 3 and 4 and suggest **one** reason why they made this decision.

.....

..... [1]

(ii) The students plotted flow lines to show their results at sites 2, 4, 6 and 8. Fig. 6 below shows the traffic flows at 08.00, and Fig. 7 on page 13 shows the traffic flows at 17.00.

For Examiner's Use

Traffic flows at 08.00

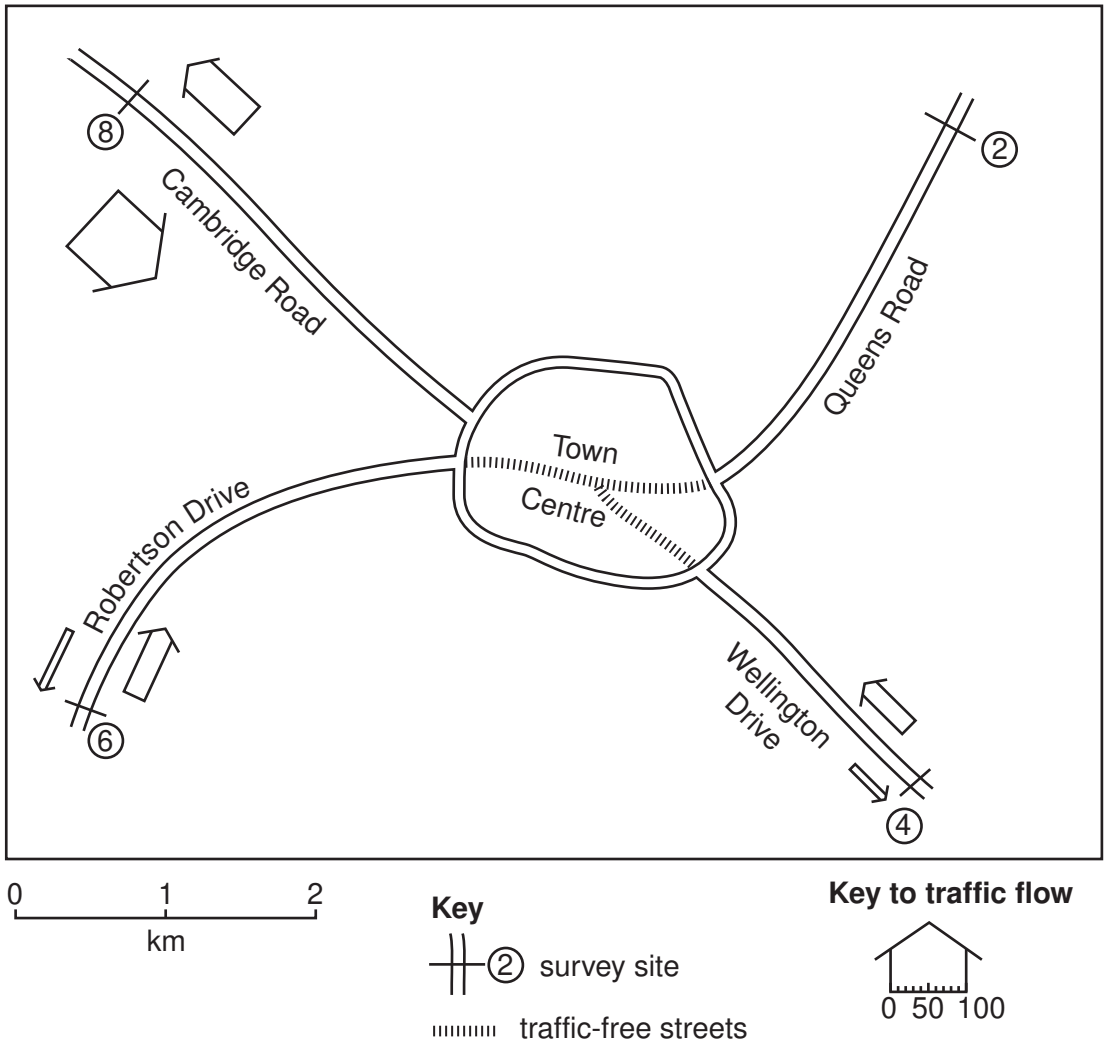

Fig. 6

Traffic flows at 17.00

For Examiner's Use

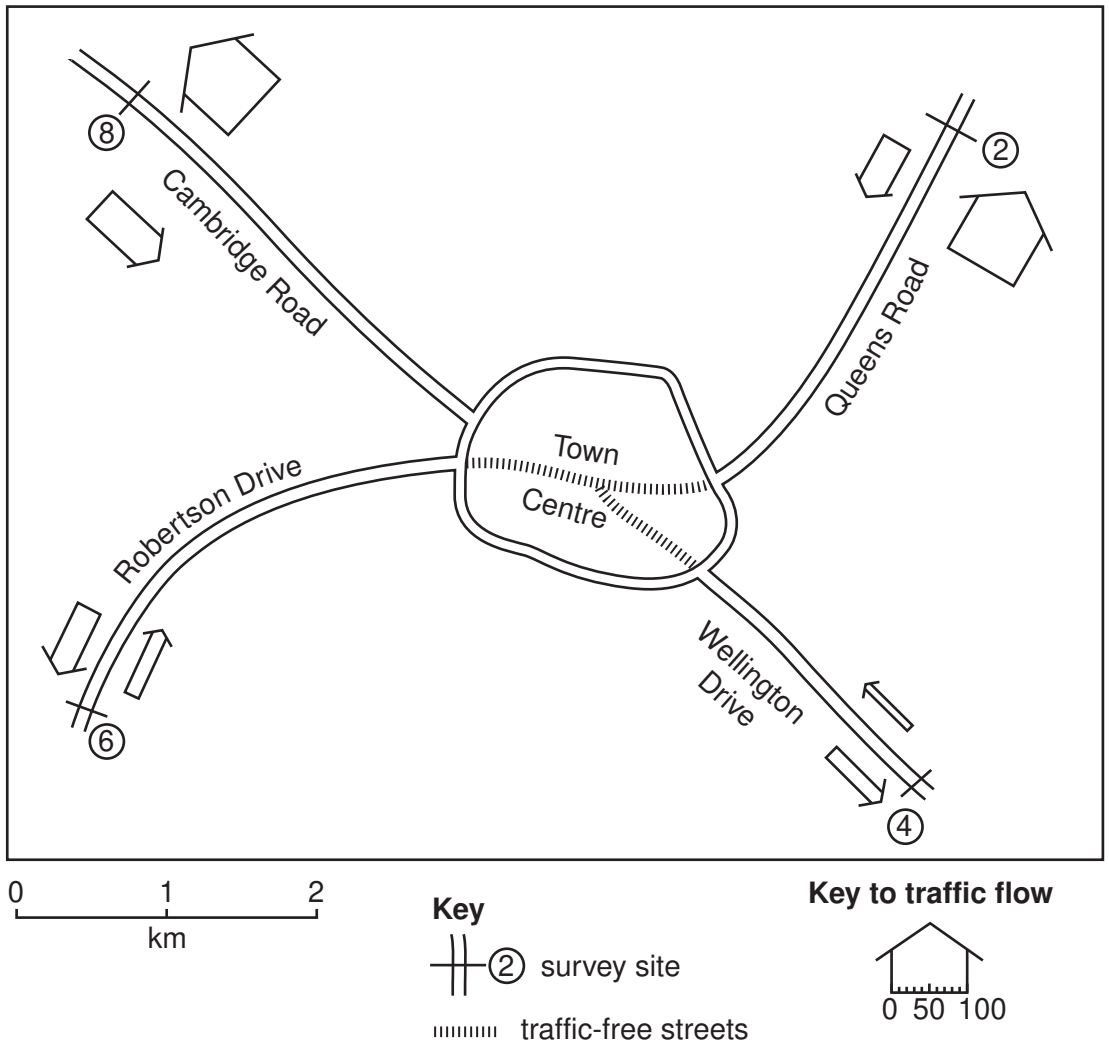

Fig. 7

Use the data from Table 4 (Insert) to draw two flow lines on Fig. 6 (page 12) to show the number of vehicles travelling along Queens Road at **08.00**. [2]

(iii) Use the data in Table 4 to complete below the rank order of the number of vehicles at 08.00. Write in the names of the three roads in the table below.

Rank	Name of road
Highest	Cambridge Road
Lowest	

[1]

(iv) What conclusion would the students make about **Hypothesis 2:** *The amount of traffic going towards and going away from the town centre will change during the day?*
Use evidence from Table 4 and Figs 6 and 7 to support your answer.

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..... [4]

(d) Suggest **three** improvements to the data collection methods used in the students' investigation.

1.....

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2.....

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3.....

..... [3]

(e) Robertson Drive and Wellington Drive provide access to a popular beach. How and why might this cause traffic flow to vary?

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..... [2]

(f) To extend her fieldwork one student decided to do an investigation into what opinions people had about the traffic-free zone in the centre of the town.

(i) Suggest a suitable hypothesis.

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..... [1]

(ii) Complete the questionnaire, Fig. 8, below, with **three** questions which the student could ask to test her hypothesis. The first part of the questionnaire has been done for you. [3]

Traffic-free zone questionnaire

Questionnaire

As part of my Geography coursework, I am doing an investigation into the traffic-free zone of the town centre. Please answer the following questions.

Male ☐ Female ☐

Age: Under 20 ☐ 20 – 35 ☐ 36 – 50 ☐

51 – 65 ☐ Over 65 ☐

Question 1.

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Question 2.

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Question 3.

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Thank you for your time.

Fig. 8

[Total: 30 marks]

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