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0460/42

May/June 2011

Candidates answer on the Question Paper.

Additional Materials: Calculator
 Ruler

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 2, Photograph A and Table 1 for Question 1, and Fig. 4 and Table 2 for Question 2.

The Insert is **not** required by the Examiner.

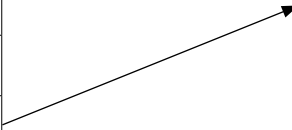
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

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

This document consists of **12** printed pages and **1** Insert.

- 1 Some students, who lived in Rio de Janeiro in Brazil, wanted to do some fieldwork in a local forest. It was a tropical rainforest but some parts had been deforested for plantation farming and to use the timber for building houses. Many types of vegetation grow naturally in the forest.

- (a) Use arrows to match the 'heads' and 'tails' in the table below to describe **three** ways that vegetation adapts to the climate in the tropical rain forest. An example has been completed for you. [3]

Heads		Tails
Drip tips on leaves		to extract soil nutrients
Shallow roots		to make the tree more stable
Large leaves		to remove heavy rainfall
Buttress roots		to allow more transpiration

The students decided to do their investigation at three areas in the forest. These are described in Fig. 1 (Insert).

The students decided to investigate vegetation cover in the three areas. They agreed on the following hypotheses:

Hypothesis 1: *There are fewer types of vegetation where water infiltrates (soaks) into the ground more quickly.*

Hypothesis 2: *Where water infiltrates into the ground more quickly, vegetation cover is greater.*

- (b) The students decided to record data on infiltration at five sites in each area. The sites were spaced every 10 metres along a transect line.

- (i) Suggest why the students decided to record data at five sites in each area.

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..... [1]

- (ii) Suggest why a transect line was used to locate the five sites in each area.

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..... [2]

- (c) (i) At each of the five sites along the transect the students measured the speed of infiltration. Fig. 2 (Insert) shows the equipment they used. Explain how they made their measurements.

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.....[3]

- (ii) The students placed a quadrat on the ground at each measuring site. A quadrat is shown in Photograph A (Insert). Using the quadrat they estimated the percentage of vegetation cover and the percentage of bare ground. They also recorded the number of types of vegetation in the area of the quadrat. The results of these measurements are shown in Table 1 (Insert).

Which area contains the highest number of vegetation types? Circle your answer.

A B C [1]

- (iii) The measurements taken at one site are shown below.

Infiltration time = 25 seconds
 Number of vegetation types = 5
 Percentage of vegetation cover = 80
 Percentage of bare ground = 20

At which site and in which area were these measurements taken?

Site

Area [1]

- (iv) Calculate the average infiltration time in area B. Show your calculation below.

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Answer: seconds [2]

- (d) Using their results from Table 1 (Insert) the students plotted the graphs shown in Fig. 3 below.

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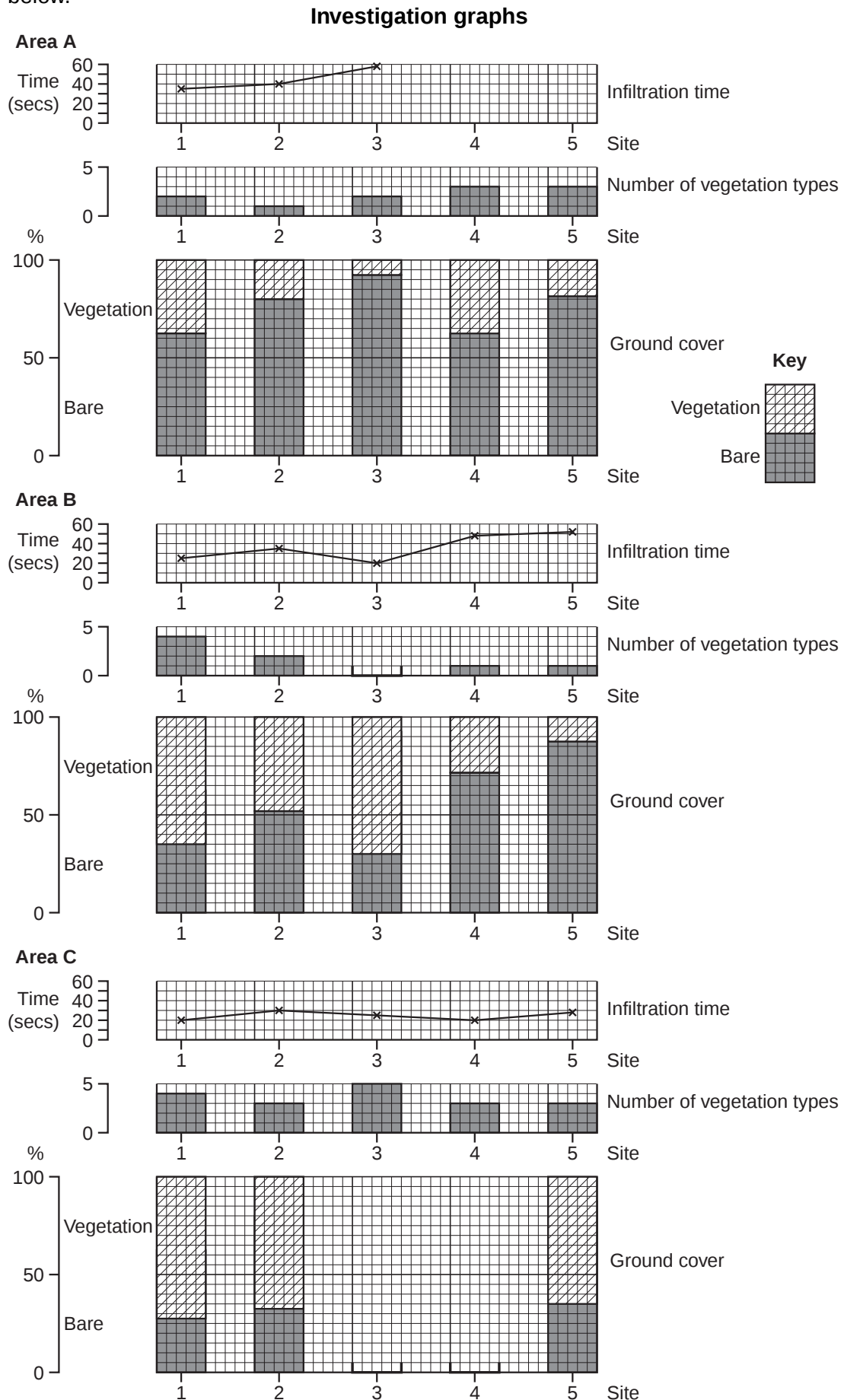


Fig. 3

- the infiltration times for sites 4 and 5 at site A.
 - the number of types of vegetation found at site 3 in area B.
 - the percentage of vegetation cover and the percentage of bare ground at sites 3 and 4 in area C.
- [5]

-[3]

- [3]

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-
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- [2]

- (e) Suggest why infiltration times are different between the three areas A, B and C in Fig. 1.

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..... [4]

[Total: 30 marks]

- 2 Students were studying shopping services in their local town. The students decided to investigate the following hypotheses:

Hypothesis 1: *People travel further to bigger shopping centres.*

Hypothesis 2: *The most common way to travel to shopping centres is by car.*

The three shopping centres which the students chose were:

- the Central Business District (CBD) located in the town centre;
- a Secondary Shopping Centre located along a main road into the town centre;
- a small Neighbourhood (Suburban) Shopping Centre located in a housing estate.

- (a) To investigate their hypotheses the students produced a sphere of influence questionnaire to use in the shopping centres. This is shown in Fig. 4 (Insert).

- (i) To gain information about **Hypothesis 1:** *People travel further to bigger shopping centres* the students wanted to ask people they interviewed: Where do you live? Their teacher suggested that they remove the question. Suggest **two** reasons why.

1
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2
..... [2]

- (ii) The students decided to use systematic sampling for the questionnaire. What is systematic sampling?

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..... [1]

- (iii) Give an advantage of systematic sampling.

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..... [1]

- (iv) The students interviewed 30 people at each shopping centre. Do you think that this is an appropriate sample size? Explain your answer.

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..... [2]

(b) The results of the students' survey for Question 1 on their questionnaire are shown in Table 2 (Insert).

- (i) Calculate the average distance travelled to the Neighbourhood (Suburban) Shopping Centre. Show your calculation in the space below.

[2]

- (ii) What is the most common distance travelled to the Secondary Shopping Centre? Insert your answer into the table below. [1]

Shopping centre	Most common distance travelled (km)
Central Business District	8
Secondary Shopping Centre	
Neighbourhood (Suburban) Shopping Centre	1

(c) The students plotted the results of Question 1 on their questionnaire onto the dispersion graphs (Fig. 5) below.

Dispersion Graphs

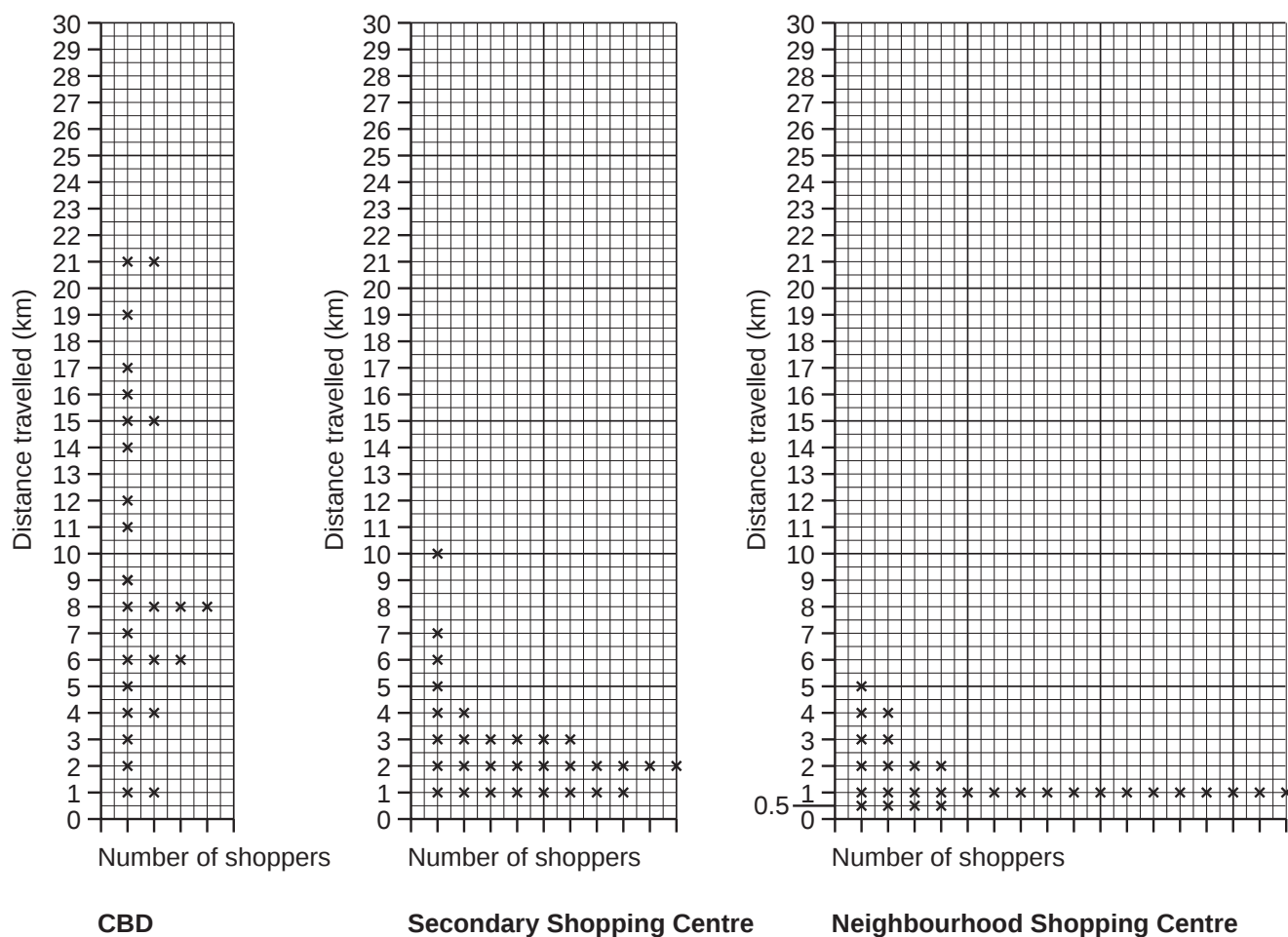


Fig. 5

(i) Use the information from Table 2 (Insert) to plot on Fig. 5 the four people who travelled more than 21 km to the CBD. [2]

(ii) Do you agree with **Hypothesis 1**: *People travel further to bigger shopping centres?* Support your conclusion with evidence from Fig. 5.

.....[4

(iii) Suggest why people travel further to some of these shopping centres than others.

.....[3]

- (d) The results of the students' survey for Question 2 on their questionnaire (*How did you travel to the shops today?*) are shown in Table 3 below.

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Table 3

Results of Question 2 in Questionnaire

	Car	Cycle	Walk	Bus
CBD	18	1	1	10
Secondary Centre	12	3	5	10
Neighbourhood Centre	4	4	21	1
Total	34	8	27	21

- (i) Use information from Table 3 to complete the pie graph for the Secondary Centre in Fig. 6 on page 11 (opposite). Use the key provided. [2]
- (ii) To what extent do the results of the students' survey support **Hypothesis 2: The most common way to travel to shopping centres is by car?** Support your conclusion with evidence from Table 3 and Fig. 6.

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.....[3]

- (iii) Suggest **three** factors which may affect people's method of travel to shopping centres.

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2

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.....[3]

Pie graphs

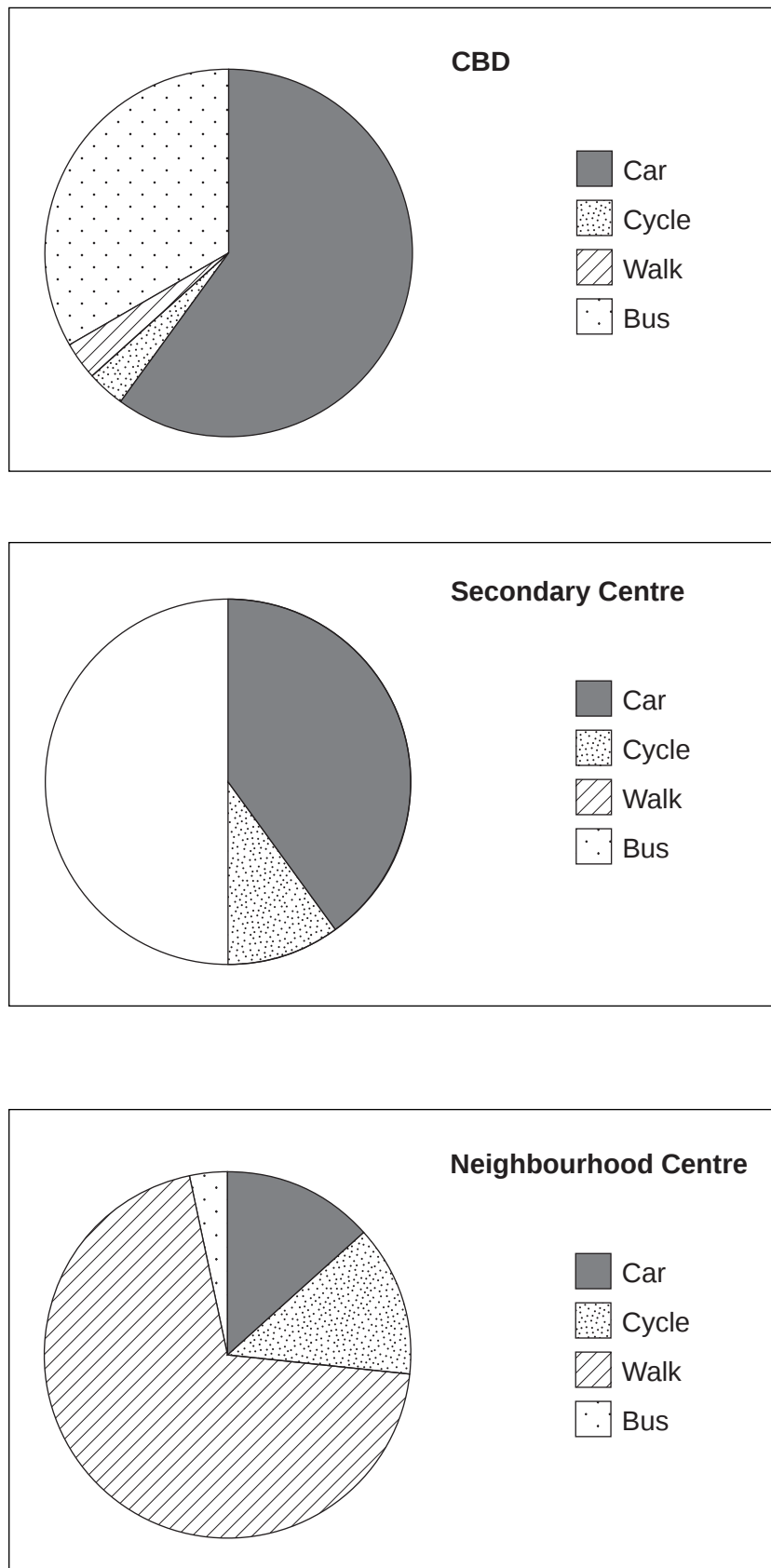
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Fig. 6

- (e) To extend their investigation the students wanted to find out about the sphere of influence of different shops. The sphere of influence is the area around a shopping centre where people who use the shops live. Explain how the students might do this.

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[Total: 30 marks]

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