CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

GEOGRAPHY **2217/22**

Paper 2 **October/November 2010**

2 hours 15 minutes

Candidates answer on the Question Paper.

Additional Materials: Calculator
                         Ruler
                         Protractor
                         Plain paper

1:50 000 Survey Map Extract is enclosed with this Question Paper.

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 IN ANY BARCODES.

Section A
Answer **all** questions.
Section B
Answer **one** question.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.
The Insert contains Photographs A and B for Question 3, Figs 8 and 9 for Question 7, Figs 12 and 13 and Photographs C, D, E, F and G for Question 8.
The Survey Map Extract and the Inserts are **not** required by the Examiner.

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	
Section A	
Q1	
Q2	
Q3	
Q4	
Q5	
Q6	
Section B	
Q7	
Q8	
Total	

This document consists of **26** printed pages, **2** blank pages and **1** Insert.

UNIVERSITY *of* CAMBRIDGE
International Examinations

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Section A

Answer **all** questions in this section.

1 Study the 1:50 000 map of Masholomoshe, Zimbabwe.

Fig. 1 shows the position of some features in the south-west of the map.
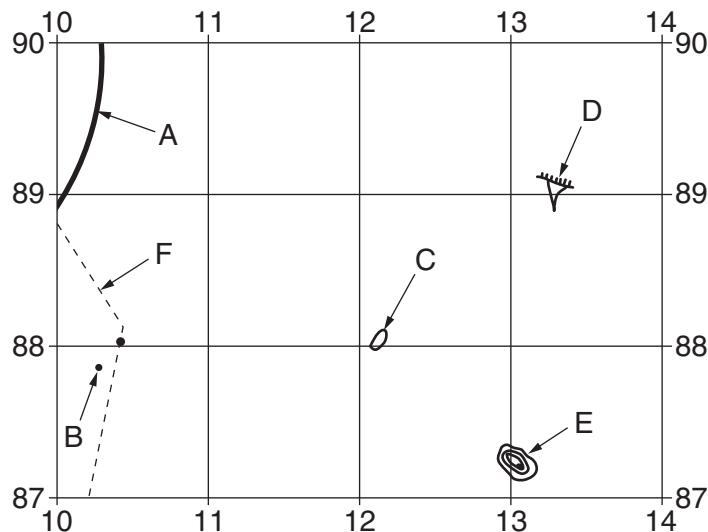
Fig. 1

(a) Using the map identify the following shown on Fig. 1:

  (i) type of road at A;

  ....[1]

  (ii) the spot height at B;

  ....[1]

  (iii) feature C;

  ....[1]

  (iv) feature D;

  ....[1]

  (v) relief feature E.

  ....[1]

(b) (i) The route of the power line (F) is shown. What feature is parallel to the power line?

  ....[1]

  (ii) On Fig. 1, draw a line that separates the rivers flowing north and east from those flowing south and west. [1]

(c) The peak of Masholomoshe is located at 153893. With the aid of the map complete Table 1 to locate features around Masholomoshe.

Name of feature	Six-figure grid reference	Bearing from Masholomoshe	Distance from Masholomoshe (m)
Aerodrome Landing Area	085880		6700
	192868	122°	4600
Silikwane Dip	204957	38°	

Table 1

[3]

(d) (i) Give **three** pieces of evidence for mining in the area of the map.

....

....

....[3]

(ii) Give a four-figure grid reference of a square that contains at least **two** of the features selected in **(d)(i)**.

....[1]

(e) Describe the distribution of huts in the area of the map.

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....[4]

(f) The Nkazhe Dam is in grid square 1791. Give map evidence, with a grid reference, for **one** way that the water from the dam is being used.

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....[2]

[Total: 20 marks]

2 Study Fig. 2, which shows percentage of total population living in urban areas and average age of the population.
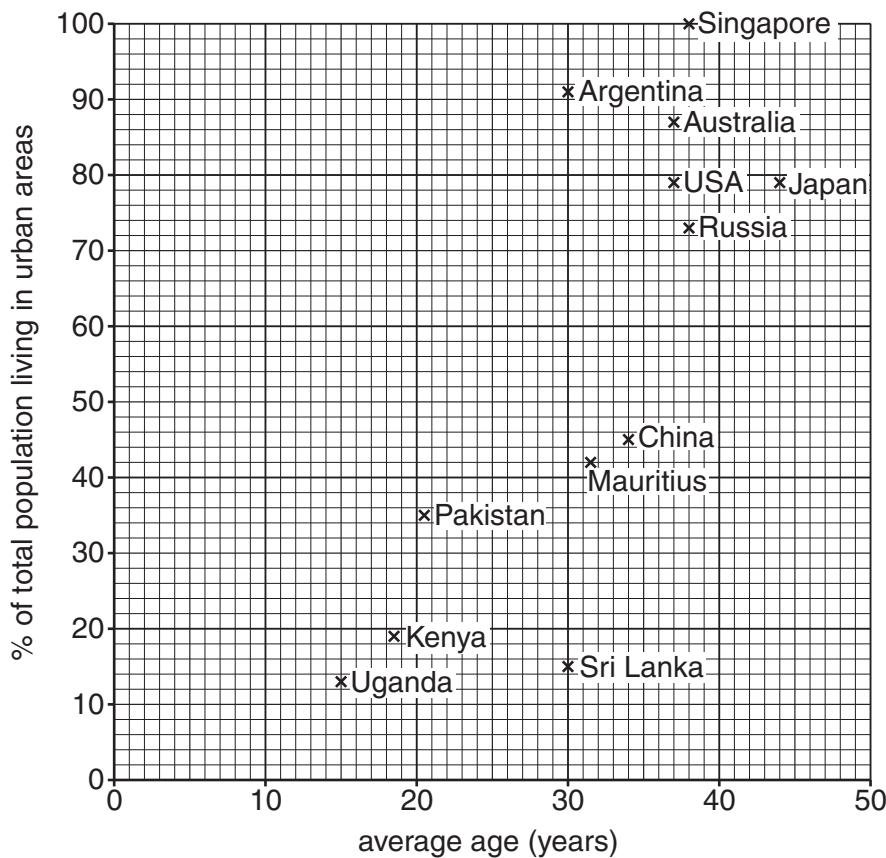
Fig. 2

(a) (i) Complete Fig. 2 to show that India has an average age of 25 and 28% of its total population living in urban areas. [1]

(ii) What kind of relationship does Fig. 2 indicate between average age and percentage of total population in urban areas?

    positive   negative   no relationship

Circle the correct answer. [1]

(iii) Which country has all of its population in urban areas?

....[1]

(iv) The populations of Argentina and Sri Lanka have the same average age. Find another pair of countries with the same average age of population.

....[1]

(b) Study Fig. 3, which shows the population structure of Argentina.
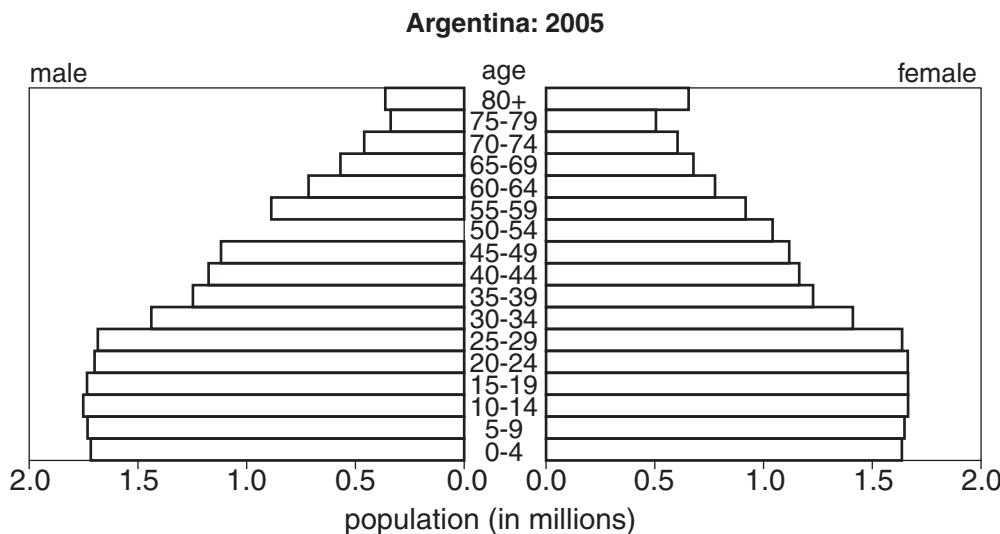
Argentina: 2005

Fig. 3

(i) Using the data from Fig. 2, draw a horizontal line on Fig. 3 to indicate the average age of the population in Argentina. [1]

(ii) Complete Fig. 3 to show 1 million males in the 50–54 age group. [1]

(iii) Which age group has the greatest population size?

....[1]

(iv) Is life expectancy greater for males or females? Give evidence from Fig. 3 to support your answer.

....

....

....[1]

[Total: 8 marks]

3 Study Photographs A and B (Insert), which show two views of an industrial site.

(a) (i) The type of industry shown in the photographs is

primary   secondary   tertiary

Circle the correct answer.   [1]

(ii) Name **two** outputs from this industry.

....

....[2]

(iii) What raw material is shown in Photograph A?

....[1]

(iv) This industry is located in a rural area away from markets. Suggest why it is located here.

....

....[1]

(b) Suggest evidence from the photographs that would indicate a low level of technology in this industry.

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....[3]

[Total: 8 marks]

4 Study Fig. 4, which shows volcanic activity during 2007.

Key • site of volcanic activity
— plate boundary
↗ direction of movement
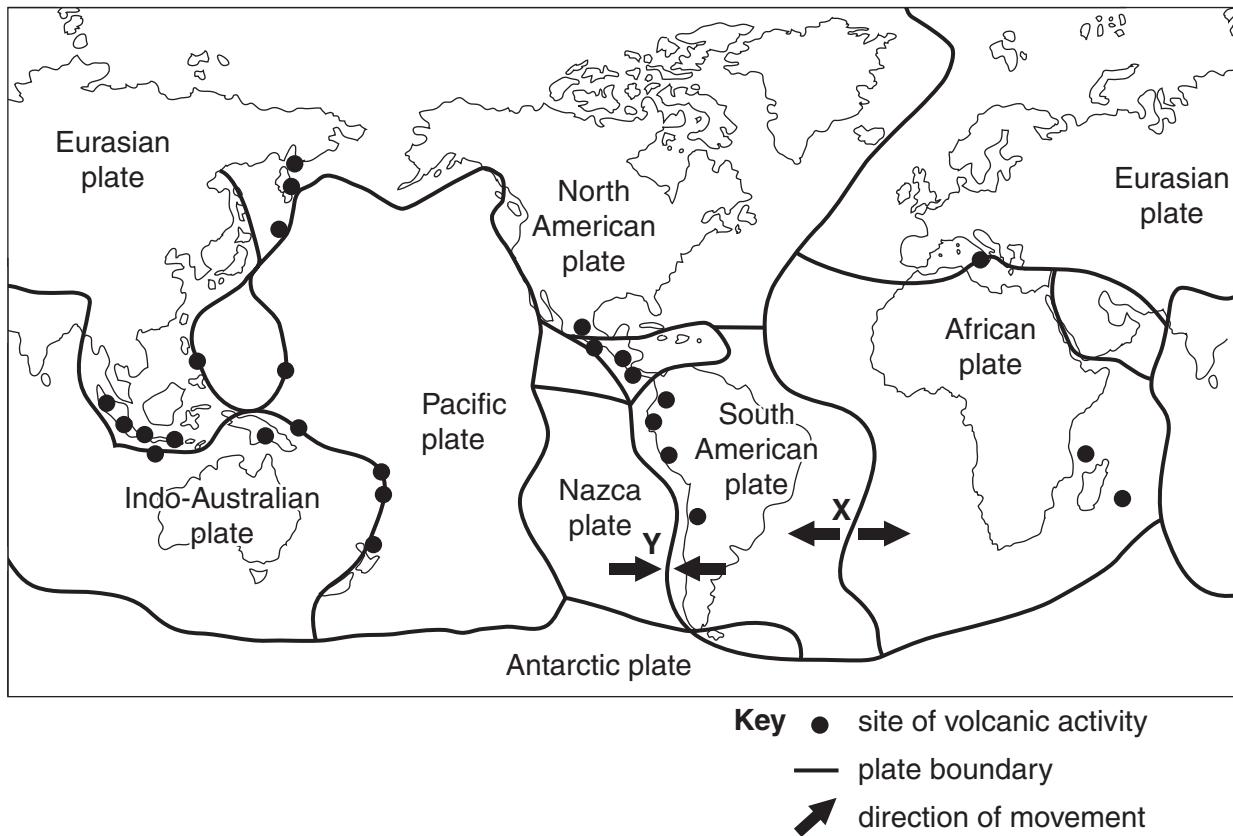
Fig. 4

(a) Describe the distribution of the volcanic activity shown on Fig. 4.

....

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....[4]

(b) (i) What type of plate boundary is at **X**?

....[1]

(ii) Name the **two** plates that meet at **Y**.

....[1]

       [Turn over

(iii) Why are volcanoes found at **Y**?

....

....

....

....[2]

[Total: 8 marks]

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5 Study Fig. 5, which shows the employment structure of China.

1978

1990

2002

Key

primary   secondary   tertiary
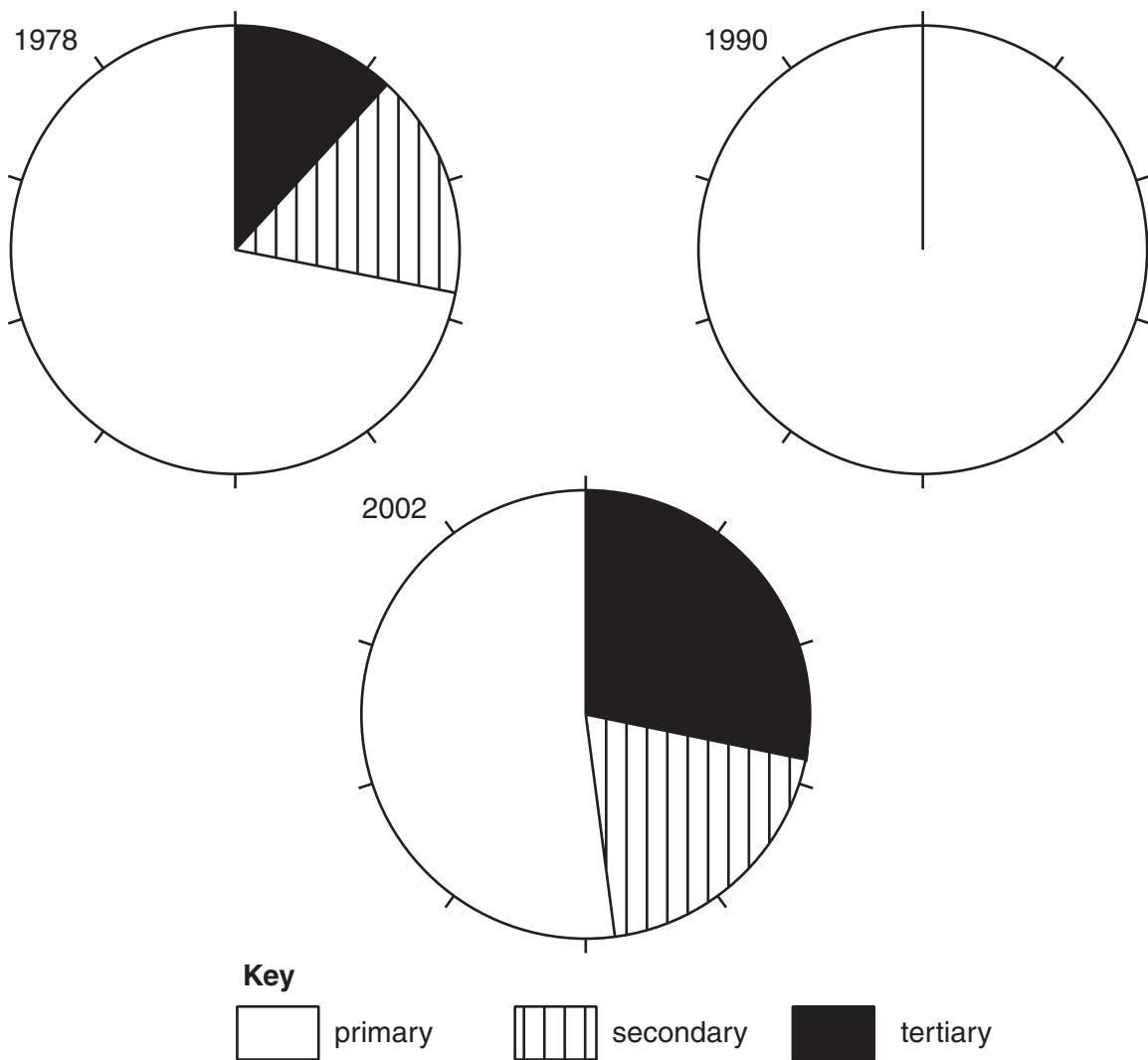
Fig. 5

(a) (i) Use the data in Table 2 to construct the pie graph for 1990 shown in Fig. 5.

Primary	62%
Secondary	20%
Tertiary	18%

[2]

Table 2

(ii) Describe the changes in employment structure in China between 1978 and 2002.

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....[3]

(b) Study Fig. 6, which shows employment in China's construction industry.
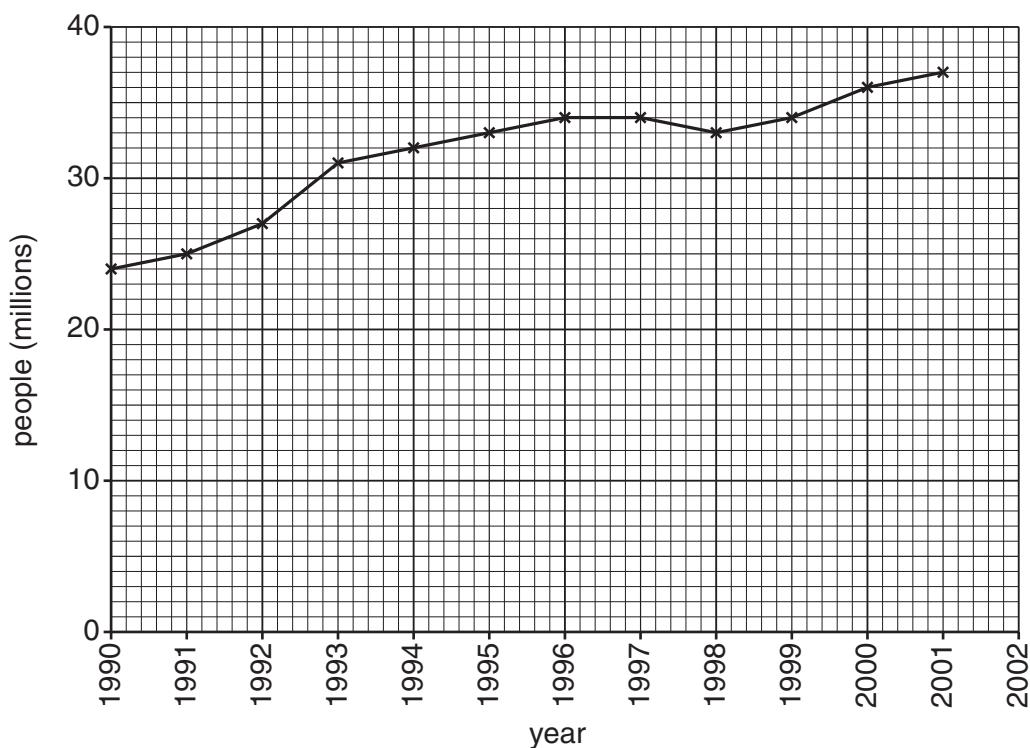
Fig. 6

(i) Complete Fig. 6 to show 39 million people employed in the construction industry in 2002. [1]

(ii) Describe the changes in the numbers employed in construction between 1990 and 2002.

....

....

....

....[2]

[Total: 8 marks]

6 Study Fig. 7A and Fig. 7B, which show climate data for Harare and Marrakesh, two cities in Africa.
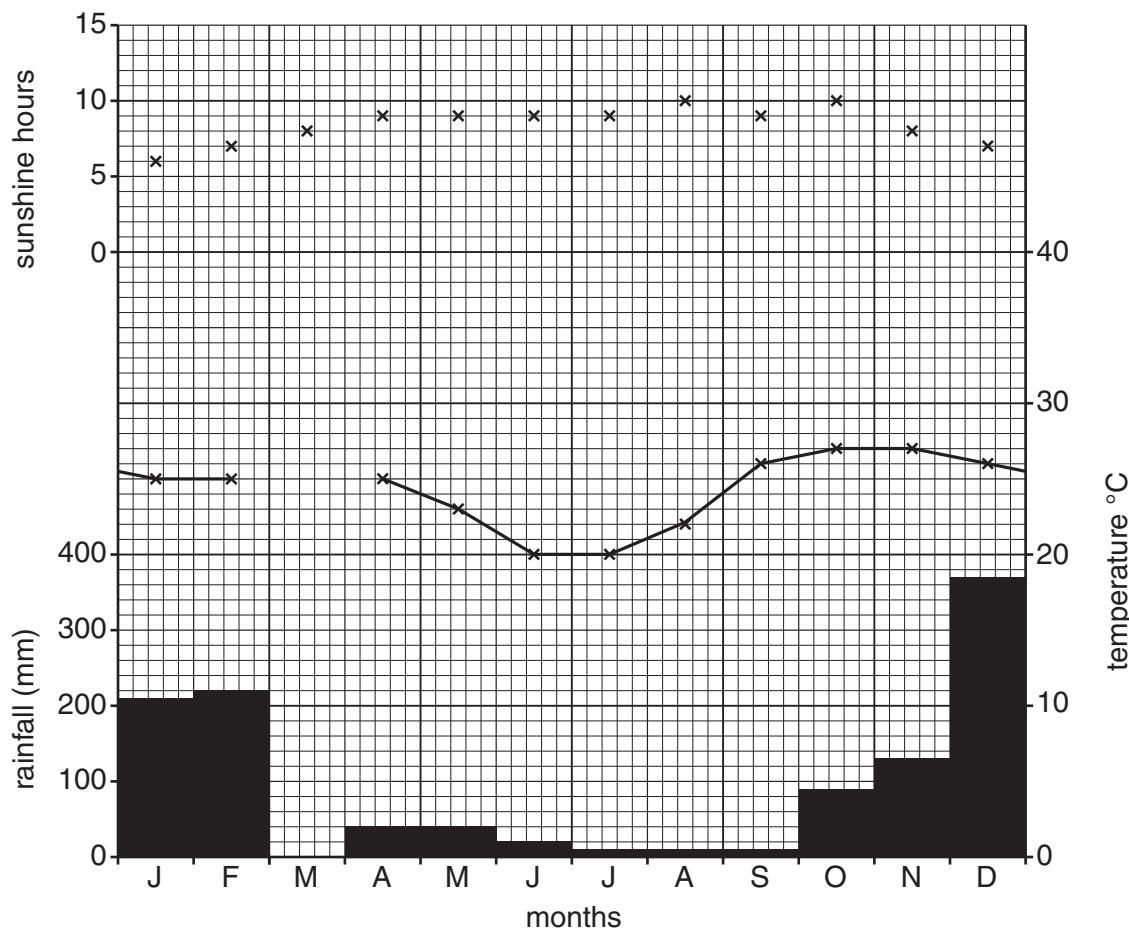
Fig. 7A   Name of city ....

Average sunshine hours – May to Sept = 9.2 hours
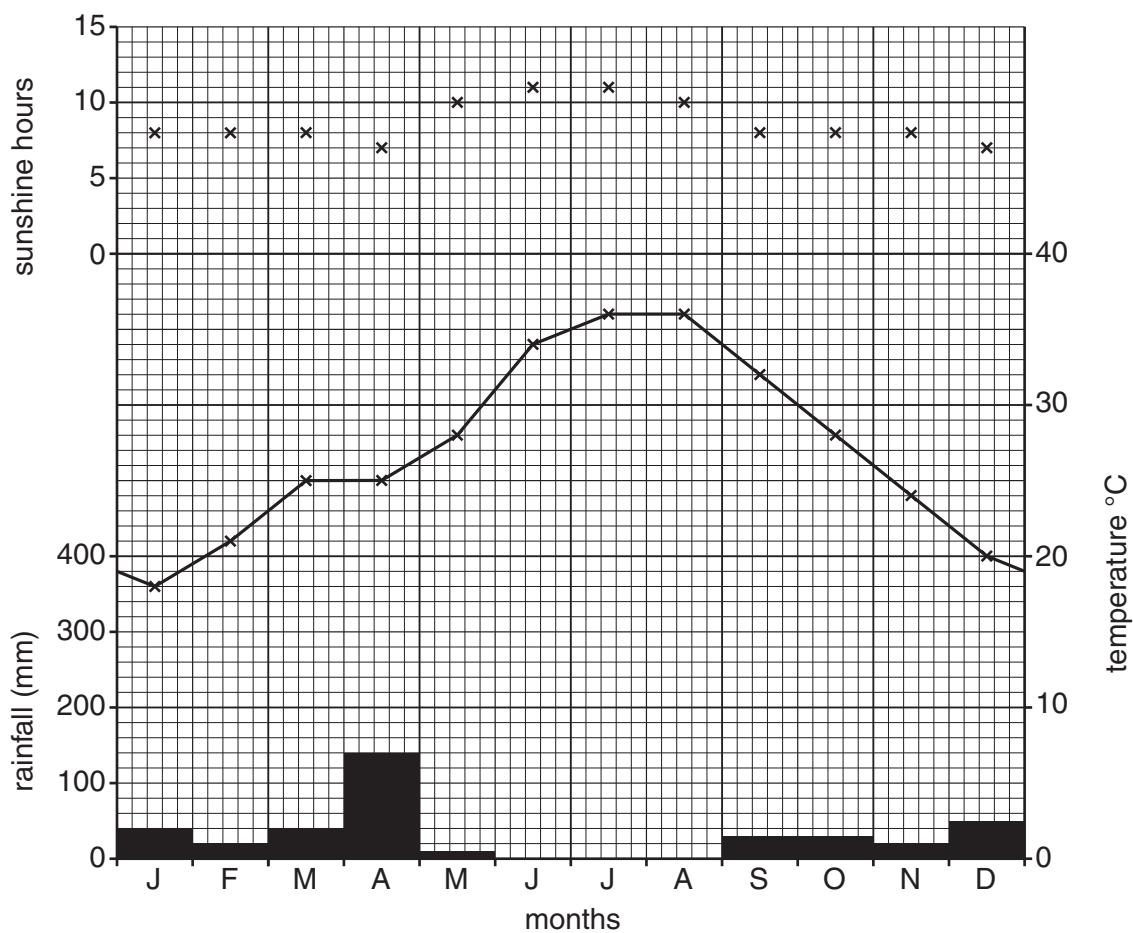
Fig. 7B   Name of city ....

Average sunshine hours – May to Sept = ... hours

(a) Harare is in the southern hemisphere and Marrakesh is in the northern hemisphere. Label each graph with the name of the correct city. [1]

(b) On Fig. 7A complete the graph to show rainfall of 230 mm and temperature of 26 °C in March. [2]

(c) Calculate the annual range of temperature shown on Fig. 7B.

   ....[1]

(d) In Fig. 7B, the temperature rises from January through to July. Suggest why the temperature does not increase during April.

   ....

   ....[1]

(e) (i) Complete Fig. 7B by calculating the average sunshine hours for May to September.

[1]

(ii) Suggest why sunshine hours peak in June and July on Fig. 7B.

....

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....[2]

[Total: 8 marks]

Section B

Answer **one** question in this section.

7 Some students were studying how the characteristics of a river change downstream. They decided to focus their fieldwork investigation on a local river to see if it had some characteristics of a text book example. These characteristics are shown in Fig. 8 (Insert).

The students agreed to investigate two hypotheses:

Hypothesis 1: *The width, depth and cross-sectional area of the river increase downstream.*

Hypothesis 2: *Velocity is greater where the river is deeper.*

(a) (i) The students wanted to take measurements at six study sites along the river. Suggest why it was important that they took all their measurements on one day.

....

....[1]

(ii) Suggest **two** other things they had to consider in choosing their investigation sites.

1 ....

....

2 ....

....[2]

(iii) In preparation they visited a local stream to do a pilot study. Give **two** advantages of doing a pilot study.

1 ....

....

2 ....

....[2]

 [Turn over

(b) The students split into two separate groups to do their fieldwork. Each group focussed on investigating one hypothesis. The first group investigated **Hypothesis 1** *The width, depth and cross-sectional area of the river increase downstream*.

(i) The students measured the width of the river channel and the depth of the river at points across the channel. They used the following equipment:

- tape measure or rope,
- metre rule or 30 cm ruler.

Describe how the students would make their measurements.

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....[3]

(ii) Having made their measurements and recorded them, the students drew a cross-section of the river channel at each site. The cross-section at Site 1 is shown in Fig. 9 (Insert). The results of measurements made at Site 4 are shown in Table 3 below.

Table 3

Distance from left bank (m)	0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2
Depth (m)	0.02	0.08	0.12	0.15	0.22	0.28	0.32	0.38	0.46	0.50	0.46	0.41

Distance from left bank (m)	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4
Depth (m)	0.37	0.34	0.28	0.21	0.18	0.16	0.12	0.08	0.06	0.05	0.01

Use the results shown in Table 3 to add the following information to Fig. 10 opposite:
- complete the cross-section of the channel,
- shade in the cross-sectional area of the river channel. [3]

Cross-section at Site 4

depth (metres)

distance from left bank (metres)

depth (metres)
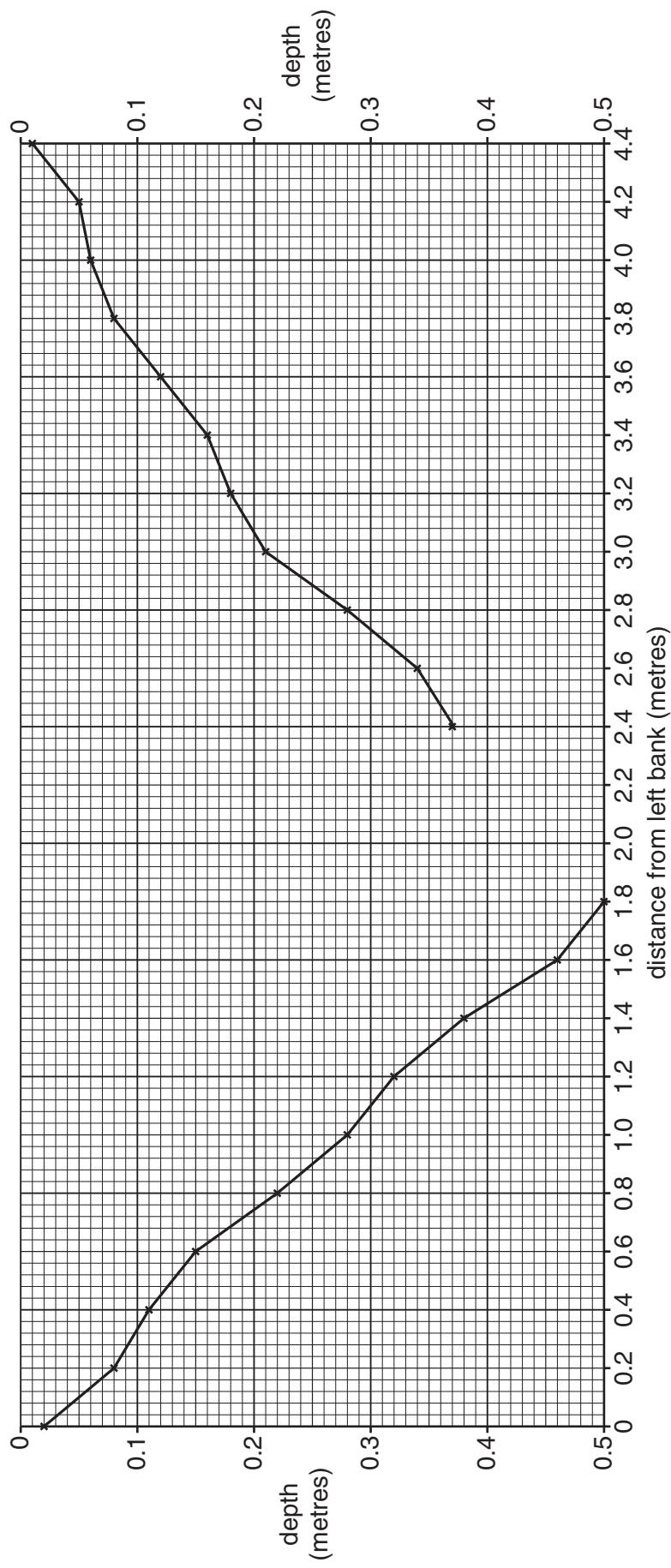
Fig. 10

(iii) The students also calculated the cross-sectional area of the channel at each site. Their calculation for Site 1 is shown below.

> Calculation of cross-sectional area at Site 1
>
> Cross-sectional area = width of river (metres) × average depth of river (metres)
>
> = 2.6 × 0.14
>
> = 0.36 sq metres

The width of the river at Site 4 was 4.4 metres and the average depth was 0.23 metres. Using this data calculate the cross-sectional area at Site 4 below. [2]

> Calculation of cross-sectional area at Site 4
>
> Cross-sectional area = width of river (metres) x average depth of river (metres)
>
> =
>
> =

(iv) Describe **two** differences between the cross-sections at Sites 1 shown in Fig. 9 (Insert) and Site 4 shown in Fig. 10.

1 ....

....

2 ....

.... [2]

(v) The summary table of measurements made at the six sites is shown in Table 4 below. Insert your answer from **(b)(iii)** into the table.

Table 4

Site	Distance from source (km)	Width of river (m)	Average depth (m)	Cross-sectional area (sq m)
1	2.60	2.6	0.14	0.36
2	6.00	3.1	0.16	0.50
3	11.40	3.6	0.20	0.72
4	14.60	4.4	0.23	
5	16.40	4.4	0.27	1.19
6	22.00	7.3	0.25	1.83

Do these results agree with **Hypothesis 1**: *The width, depth and cross-sectional area of the river increase downstream*? Identify a result that does not fit the general pattern.

....

....

....

....[2]

(c) The second group of students were investigating **Hypothesis 2**: *Velocity is greater where the river is deeper*.
They needed to measure the velocity of the river at each of the six survey sites. Two possible methods to make these measurements were to use **either** a flow meter **or** floats and a stopwatch.

(i) Choose **one** of these methods and describe how the students would do the investigation.

....

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....

....

....[3]

 [Turn over

(ii) For the method which you did **not** choose, give **one** advantage and **one** disadvantage of this method.

Advantage ....

....

Disadvantage ....

....[2]

(iii) The students' results are shown in Table 5 below.

Table 5

Study site	Average depth (m)	Average velocity (metres per second)
1	0.14	0.44
2	0.16	0.51
3	0.20	0.60
4	0.23	0.62
5	0.27	1.20
6	0.25	1.30

The students plotted these results on a scatter graph, Fig. 11 below.
Complete Fig. 11 by adding the results for sites 5 and 6. [2]

Scatter Graph to show relationship between depth of river and average velocity
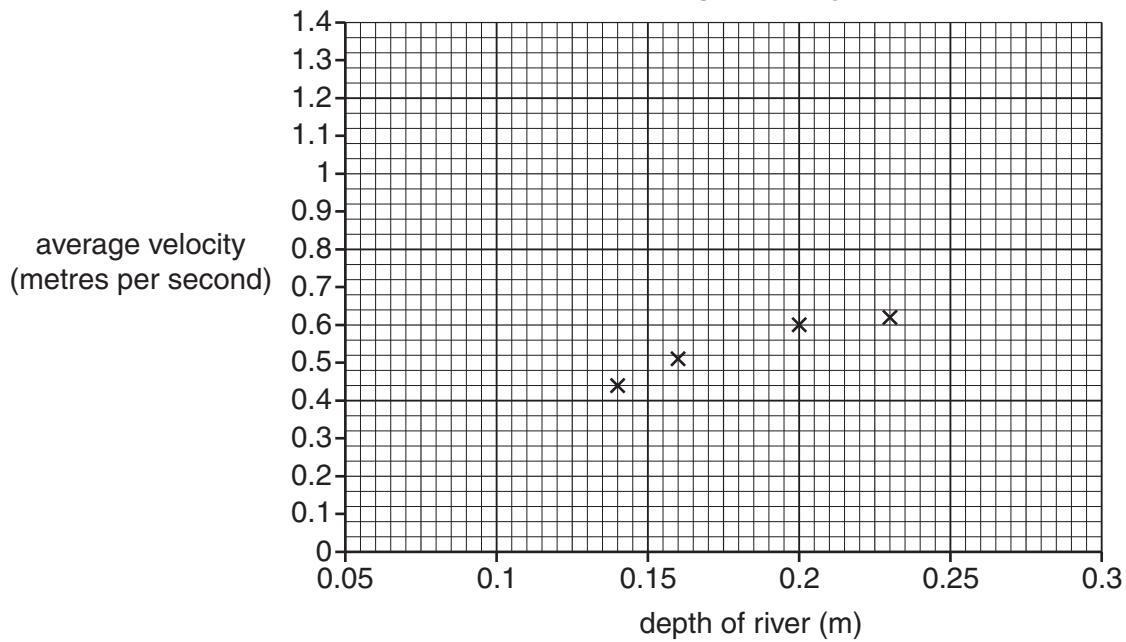
Fig. 11

(iv) To what extent do you agree with **Hypothesis 2**: *Velocity is greater where the river is deeper*? Use the information in Fig. 11 to help you to answer.

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....

....[3]

(d) Whilst making their measurements, one observant student noticed how the river valley was different at the six sites. How could the student record these differences during fieldwork?

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....

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....[3]

[Total: 30 marks]

8 A group of students decided to do an investigation about the location of high technology industries. They wanted to discover more about some location factors which they had studied in their course. These factors are shown in Fig. 12 (Insert).
The students based their hypotheses on two of these factors.

> **Hypothesis 1**: *Companies in high technology industries are usually located near to other similar high technology companies.*

> **Hypothesis 2**: *Companies in high technology industries need highly skilled or trained employees.*

To begin their investigation the students visited an industrial area on the edge of the city where they lived. This industrial estate is shown in Fig. 13 (Insert) and Photograph C (Insert).

(a) Look at Fig. 13 and Photograph C.

   (i) Which landscape feature is labelled **X** on Photograph C?

   .... [1]

   (ii) What is the number of the building labelled **Y** on Photograph C?

   .... [1]

(b) Look at Photographs D to G (Insert). They show different views of the industrial estate. Describe features of the landscape and buildings shown in the photographs.

   Landscape ....

   ....

   ....

   ....

   Buildings ....

   ....

   ....

   ....[4]

(c) To investigate their hypotheses, the students did a survey of the companies on the industrial estate. An example of a completed survey sheet is shown below.

Example of completed survey sheet

Unit number of company building on industrial estate	**300**
Type of industrial sector	**Environmental**
Number of employees	**40**

(i) Suggest why the students did not include the name of the company on their survey sheet.

....

....[1]

(ii) The students produced a summary table of the results of their survey. They then grouped the companies into common industrial sectors. Fig. 14, below, shows companies in the computer/telecommunications sector.

Companies in the computer/telecommunications sectors

Unit number of the company building (shown on Fig. 13)	Number of employees in the company
2	19
10	26
23	15
216	39
230	40
240	89
290	95

Fig. 14

Locate these companies on Fig. 13.

Describe the distribution within the industrial estate of companies in the computer/telecommunications sector.

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....[3]

(iii) Fig. 15, below, shows the overall results of the survey. Use data from Fig. 14 to complete Fig. 15. [2]

Results of survey

High technology industries on the industrial estate	Number of companies	Percentage of total number of companies	Average number of employees
Bio-medical	28	30	61
Computer / telecommunications		8	46
Energy	4	4	30
Environmental	26	28	38
Financial / Business	5	5	53
Industrial technologies	7	8	27
Technical consulting	6	6	23
Other industries	10	11	71
Total		**100**	

Fig. 15

(iv) Use the percentage data in Fig. 15 to complete Fig. 16 below using the key provided. [2]

Percentage of total number of companies

Key

■ Bio-medical
▨ Computer / telecommunications
⬚ Energy
░ Environmental
⊠ Financial / Business
▦ Industrial technologies
⊞ Technical consulting
⊟ Other industries
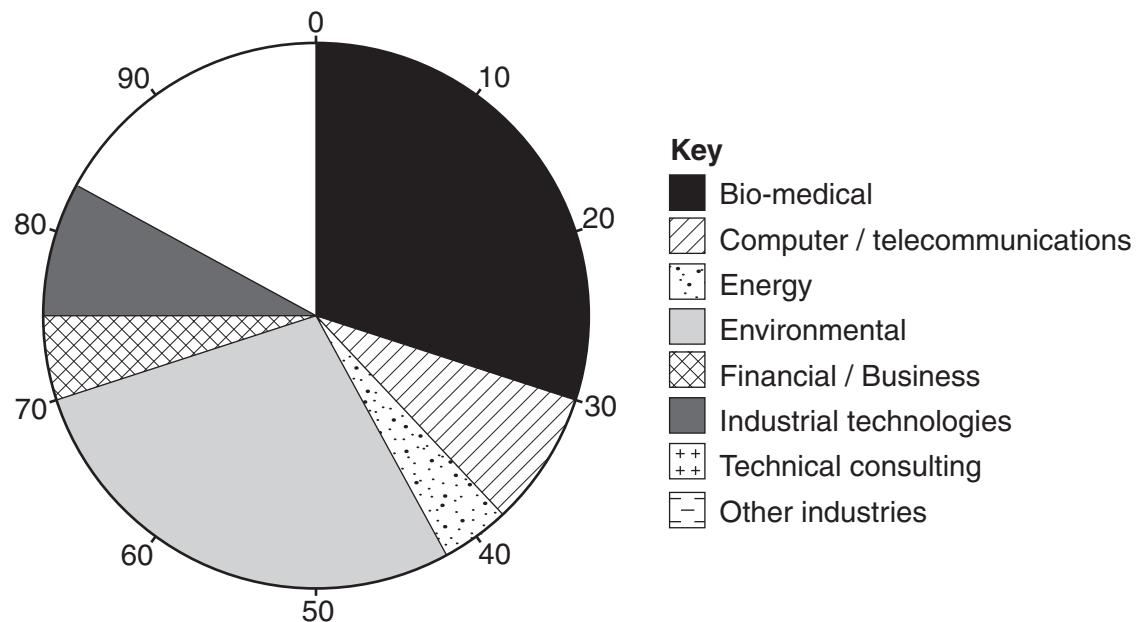
Fig. 16

(v) Why did the students come to the conclusion that **Hypothesis 1**: *Companies in high technology industries are usually located near to other similar high technology companies* is true? Use the results in Figs 15 and 16 to support your answer.

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....[2]

(vi) Explain why high-technology companies are usually located near to other similar companies.

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....[3]

(vii) Whilst doing their survey, the students found out that companies in the 'other industries' sector shown in Fig. 15 included services such as a nursery, gym, restaurant and leisure centre.
Suggest **two** reasons why such companies would locate on this industrial estate.

1 ....

....

2 ....

....[2]

(d) To investigate **Hypothesis 2:** *Companies in high technology industries need highly skilled or trained employees,* the students looked again at Fig. 15.

(i) Use the data from Fig. 15 to complete Fig. 17 below. [2]

Average number of employees in each sector

Industrial sector
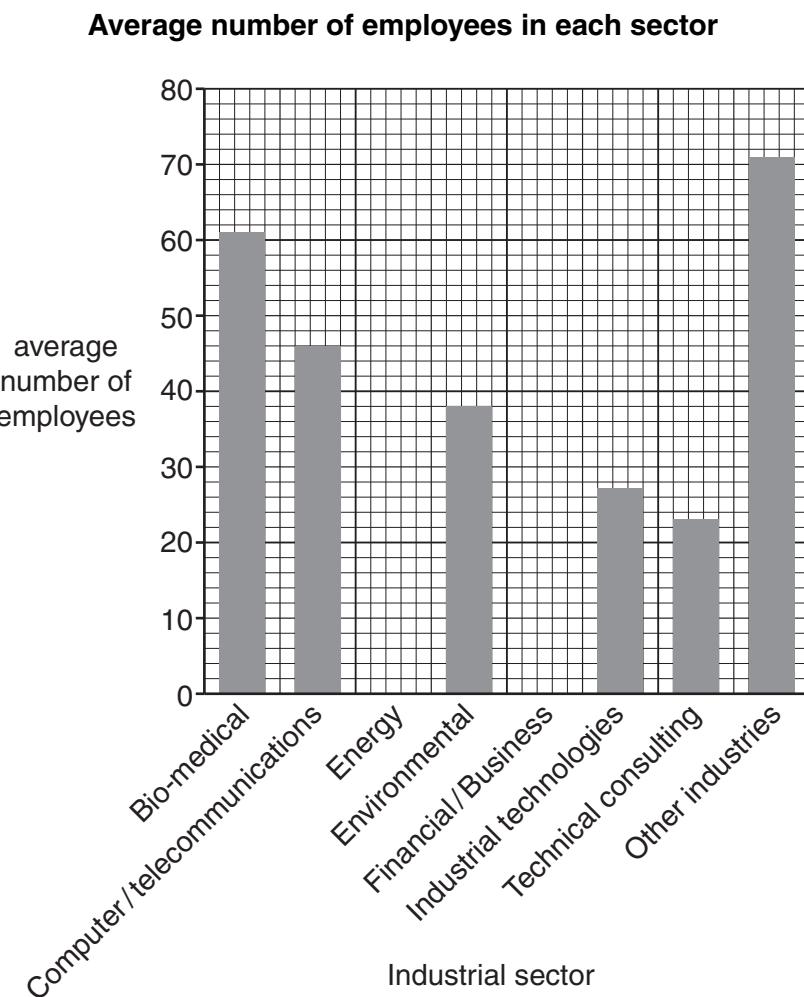
Fig. 17

(ii) The students realised that this data by itself was not sufficient to make a conclusion about **Hypothesis 2**. Therefore they visited the biggest company on the industrial estate to find out more details about its employees.
Suggest **three** questions that would help the students to reach a conclusion about **Hypothesis 2**.

1 ....

....

2 ....

....

3 ....

....[3]

(e) Having completed their study, the students decided to do a further investigation task and look at the other factors which affect the location of high technology industries shown in Fig. 12 (Insert).

These two factors are:

- High technology industries need good transport links.
- High technology industries need small quantities of raw materials.

Suggest how they could carry out an investigation into **one** of these factors.

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....[4]

[Total: 30 marks]

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