UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4189190348

BIOLOGY **0610/22**

Paper 2 Core **October/November 2011**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

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 pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
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	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

This document consists of **19** printed pages and **1** blank page.

UNIVERSITY of CAMBRIDGE International Examinations

1 Fig. 1.1 shows five arthropods, each with four pairs of legs.

For Examiner's Use

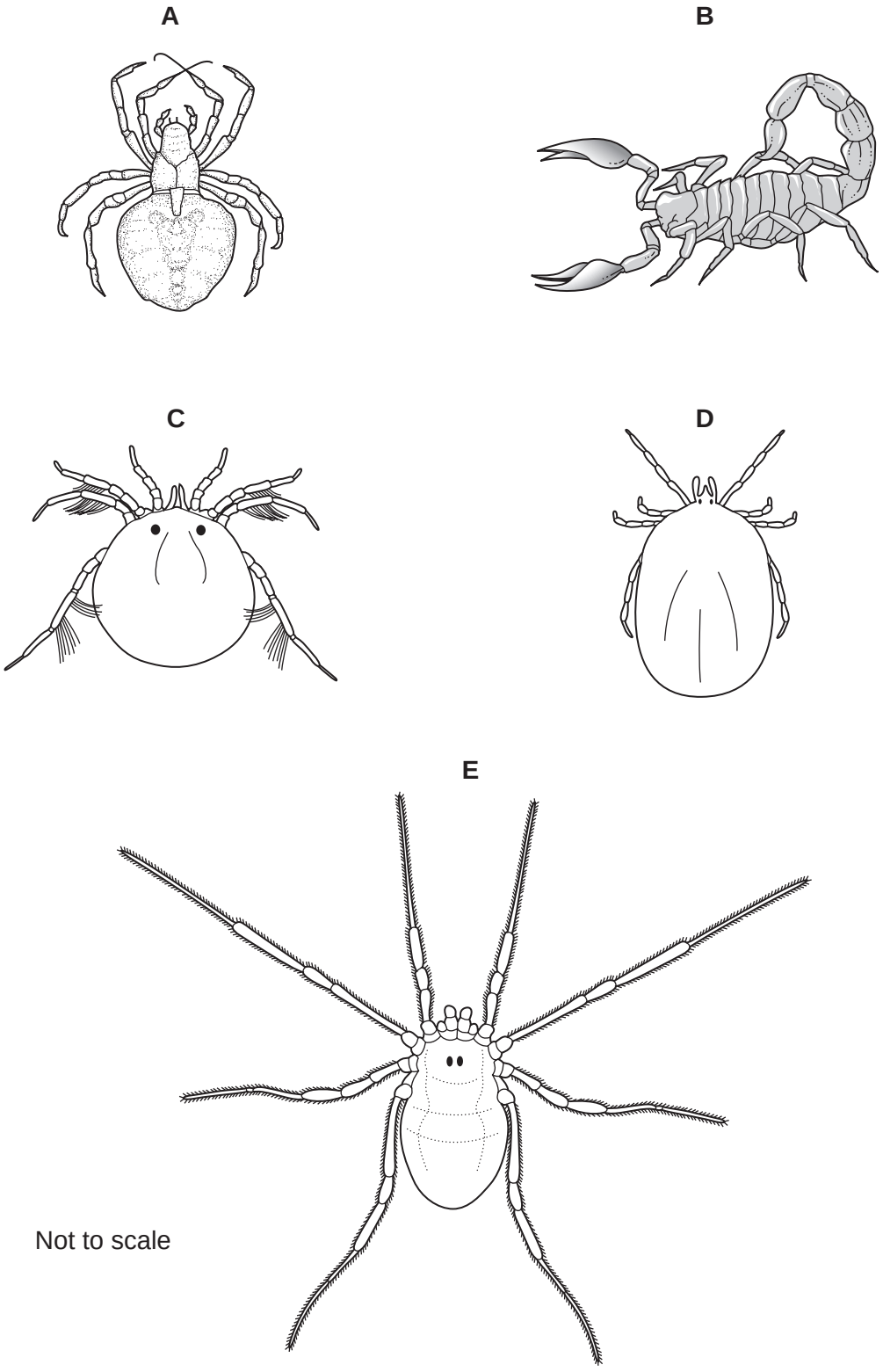

Fig. 1.1

For Examiner's Use

(a) These five arthropods all belong to the same group.

To which group of arthropods do they all belong?

Tick (✓) **one** box to show your answer.

arachnids	
crustaceans	
insects	
myriapods	

[1]

(b) Use the key to identify each of these arthropods.

Write the name of each animal in the correct box in Table 1.1.

Key

	name of arthropod
1 (a) legs with hairs (b) legs without hairs	go to 2 go to 3
2 (a) legs with small groups of hairs (b) legs hairy all over	*Hydrachna* *Oligolophus*
3 (a) body clearly has two main regions (b) body seems to have only one main region	go to 4 *Ixodes*
4 (a) body clearly segmented, pincers present (b) body with no segments, no pincers	*Buthus* *Araneus*

Table 1.1

animal	name of arthropod
A	
B	
C	
D	
E	

[4]

[Total: 5]

[Turn over

2 Fig. 2.1 shows a section through the human chest (thorax).

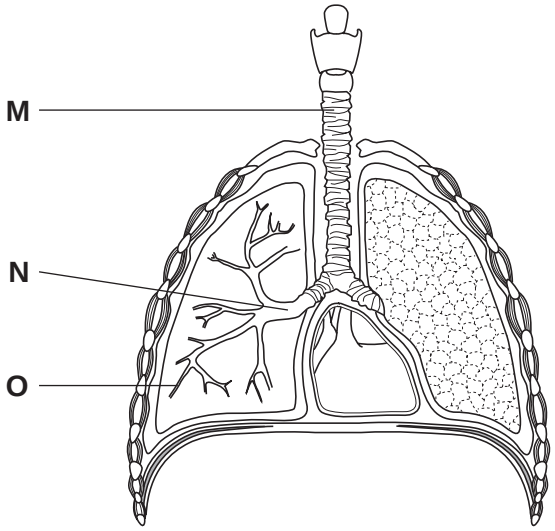

Fig. 2.1

(a) Name the structures labelled **M**, **N** and **O**.

M .....

N .....

O ..... [3]

(b) The breathing rates of some students were measured before they started running.

Describe how you could measure the breathing rates.

.....

.....

.....

..... [2]

(c) Fig. 2.2 shows the results of an investigation into the breathing rates of some students before and immediately after running.

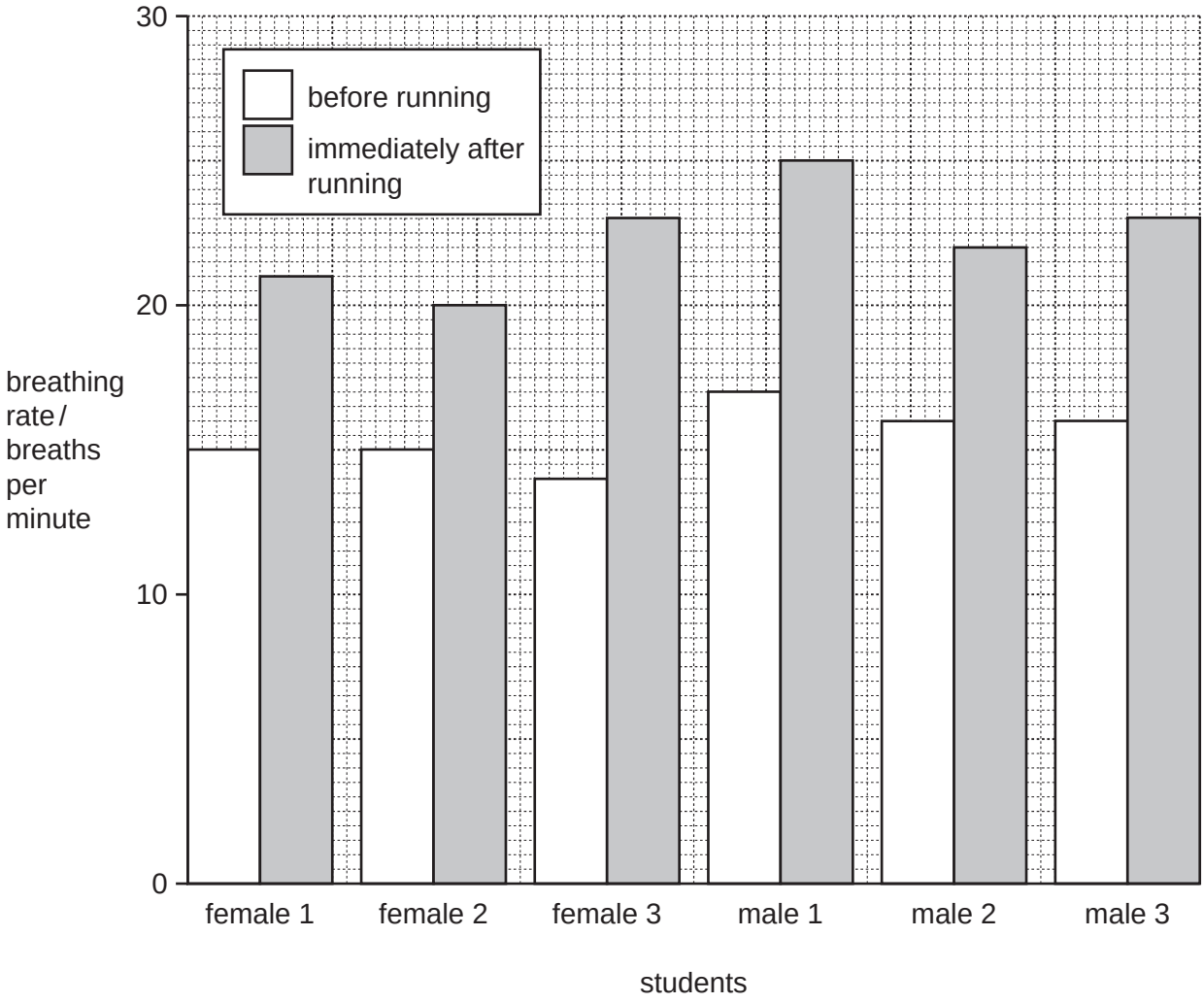

Fig. 2.2

(i) State which student has the highest breathing rate before running.

.....[1]

(ii) State which student has the smallest change in breathing rate from before to immediately after running.

.....[1]

(iii) Describe any patterns shown by the results.

.....

.....

.....

.....[2]

(d) Explain why breathing rate changes during exercise.

For Examiner's Use

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.....

.....

.....

.....

..... [4]

[Total: 13]

For Examiner's Use

3 **(a)** Seeds of plants are dispersed by wind and animals.

Suggest three advantages to a plant of the dispersal of its seeds.

1 .....

2 .....

3 ..... [3]

(b) When seeds have germinated the young plants show phototropism.

(i) Define the term *phototropism*.

.....

.....

.....

..... [2]

(ii) Suggest the advantages to a young plant of phototropic responses.

.....

.....

.....

..... [2]

[Total: 7]

4 Fig. 4.1 shows the cycling of phosphate ions in living organisms and the environment.

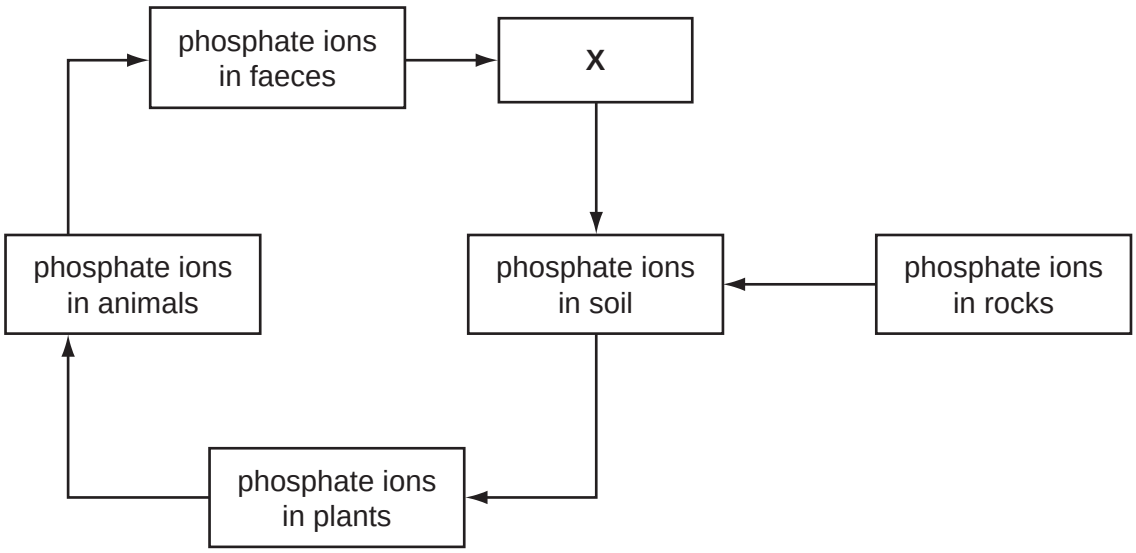

Fig. 4.1

(a) Phosphate ions are often in limited supply in the soil but are needed by all living organisms.

(i) Describe how plants might obtain phosphate ions from the soil.

.....

.....

.....

..... [2]

(ii) Name **one** group of organisms represented by box **X**.

..... [1]

(b) In humans, phosphate ions may be used in a similar way to calcium ions.

(i) Phosphates may be present in the diet as soluble phosphate ions.

Suggest why only the soluble phosphates in food enter the bloodstream of a human.

.....

..... [1]

(ii) Name **one** human tissue that is likely to contain phosphates.

..... [1]

(c) Using information from Fig. 4.1, suggest why mammal or bird faeces are often used as a fertiliser.

For Examiner's Use

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.....

.....

.....

..... [3]

[Total: 8]

For Examiner's Use

5 **(a)** One function of the blood is to transport substances around the body.

Complete Table 5.1 to show where some substances may enter and leave the blood.

Table 5.1

substance	enters the blood	leaves the blood
oxygen	.....	muscle cells
insulin	pancreas	.....
urea	liver	.....

[3]

(b) Another function of the blood is to form a clot if the skin is cut.

State two advantages to the body of the blood clotting at a cut in the skin.

1 .....

.....

2 .....

..... [2]

[Total: 5]

For Examiner's Use

6 Fig. 6.1 shows a food web from the African savannah (grassland).

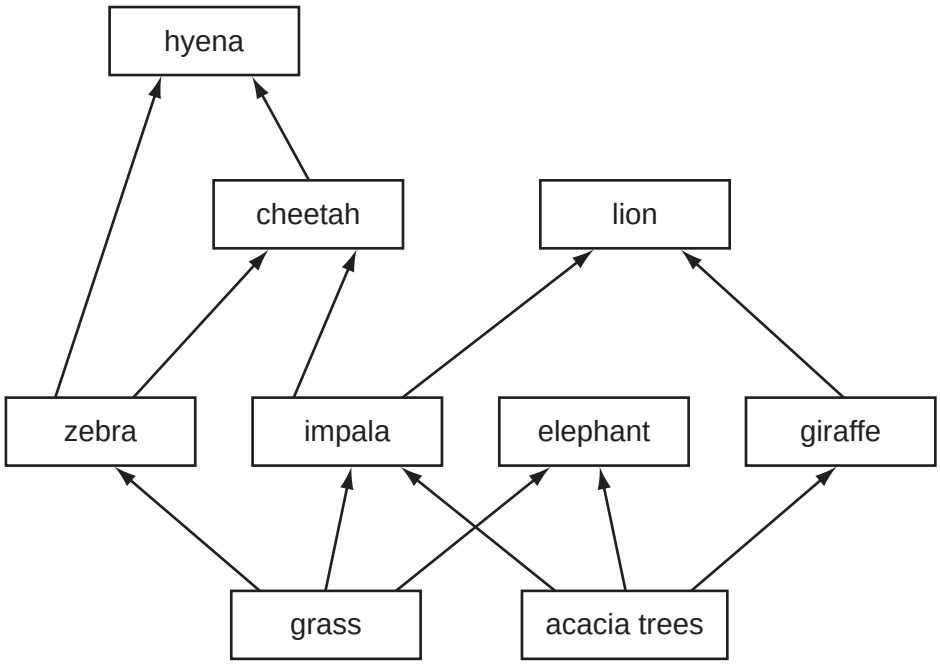

Fig. 6.1

(a) (i) State the trophic level that the acacia trees occupy.

.....[1]

(ii) Name **one** secondary consumer in Fig. 6.1.

.....[1]

(b) Elephants are herbivores.

(i) Explain what is meant by the term *herbivore*.

.....

.....

.....

.....[2]

(ii) Suggest why elephants are not linked to any of the predators in the food web.

.....

.....[1]

[Turn over

For Examiner's Use

(c) Decomposers are found on the dead bodies of plants and animals.

(i) Name **one** type of decomposer in such a food web.

.....[1]

(ii) Explain why decomposers are very important in the savannah ecosystem.

.....

.....

.....

.....

.....

.....[3]

(d) Draw a food chain of **four** organisms using information from Fig. 6.1.

.....[3]

[Total: 12]

7 Explain how the use of herbicides in farming has resulted in increased food production.

For Examiner's Use

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.....

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..... [4]

[Total: 4]

For Examiner's Use

8 Fig. 8.1 shows changes in the dry mass of pea seeds as they germinate and grow into seedlings.

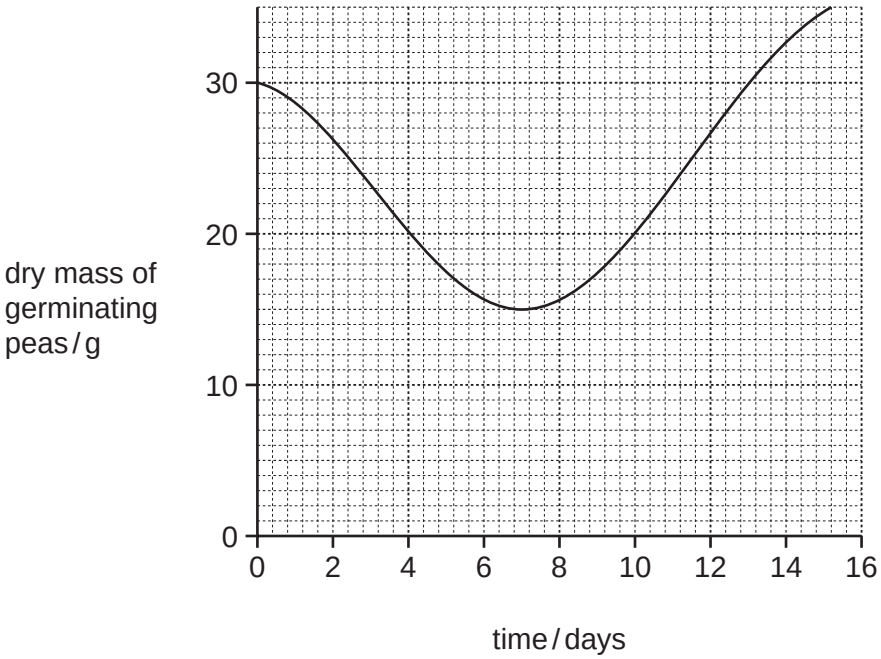

Fig. 8.1

(a) Explain why the germinating peas lost dry mass during the first days of the investigation.

.....

.....

.....

.....

..... [3]

(b) Suggest why the pea seedlings increased in dry mass after day 7.

.....

.....

.....

.....

..... [3]

(c) State how long after the start of the investigation it took for the seedlings to regain their original dry mass.

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.....

..... [1]

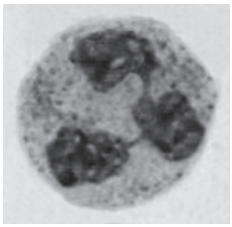
[Total: 7]

For Examiner's Use

9 Fig. 9.1 shows four animal cells.

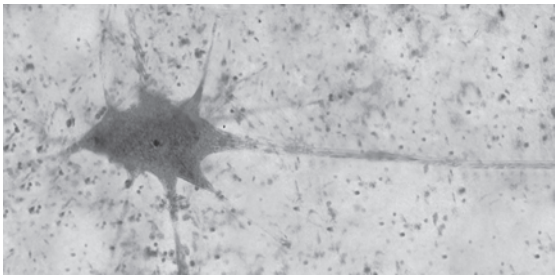
A

B



C

nerve cell



D

red blood cell

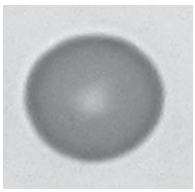


Fig. 9.1

(a) (i) Identify the cells labelled **A** and **B**.

A .....

B ..... [2]

(ii) State the function of cell **A** and describe how it is adapted to this function.

.....

.....

.....

..... [2]

(iii) State **one** function of cell **B**.

.....

..... [1]

For Examiner's Use

(b) The cells in Fig. 9.1 are all from the human body.

Complete Table 9.1 to show the number of chromosomes in these cells. One has been completed for you.

Table 9.1

type of cell	number of chromosomes
cell **A**	.....
cell **B**	.....
nerve cell **C**	46
red blood cell **D**	.....

[3]

[Total: 8]

10 Thalassaemia is an inherited condition in which the haemoglobin does not work properly.

People who have thalassaemia have inherited an allele that causes the condition from both parents. This can happen even if neither parent has the condition.

(a) (i) State what is meant by the term *homozygous*.

.....

..... [1]

(ii) State and explain whether the allele that causes thalassaemia is dominant or recessive.

.....

.....

.....

..... [2]

(iii) Using the symbols **T** (dominant) and **t** (recessive) to represent the two alleles, state the possible genotypes for a person who does **not** show symptoms of this condition.

..... [1]

(b) Complete the genetic diagram to explain how two parents who do not show symptoms of the condition can have a child who does have thalassaemia.

For Examiner's Use

	parent 1		parent 2
parental phenotypes	no thalassaemia	×	no thalassaemia
parental genotypes	.....	×	.....
gametes	....	+	....

offspring genotypes	.....	.....	.....	.....
offspring phenotypes	.....	.....	.....	.....
	.....	.....	.....	.....

[4]

(c) (i) Thalassaemia has symptoms very like those of anaemia. A deficiency of a mineral in the diet causes anaemia.

Name this mineral.

..... [1]

(ii) Suggest why people who have thalassaemia find any physical activity very difficult.

.....

.....

.....

..... [2]

[Total: 11]

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