

Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B493/02

**ENVIRONMENTAL AND LAND-BASED
SCIENCE**

**Management of the Natural Environment
(Higher Tier)**

WEDNESDAY 20 MAY 2009: Afternoon

DURATION: 45 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Electronic calculator

Pencil

Ruler (cm/mm)

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**
- **There are no separate marks for the quality of written communication, but make sure that your answers are written in clear and well-structured English.**

INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this paper is 36.**

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Answer ALL the questions.

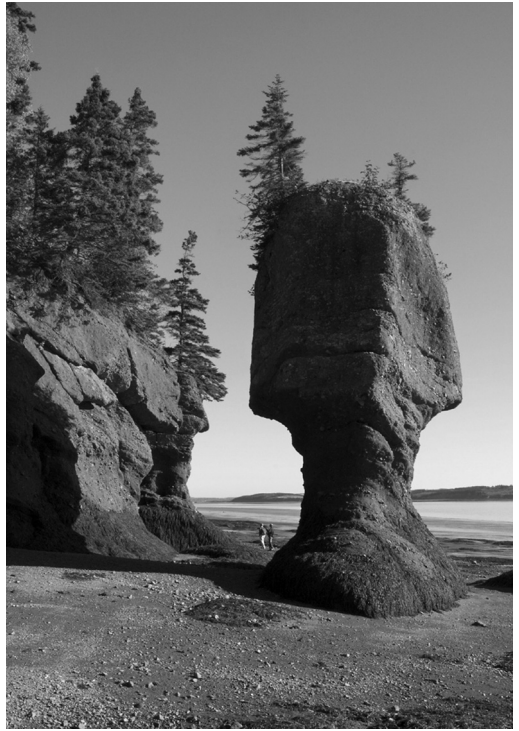
- 1 The pictures on page 5 opposite show four different landscapes.
They are being formed by either by EROSION or DEPOSITION.**

Which one of these landscapes is being formed by DEPOSITION?

Answer A, B, C or D _____ [1]



A



B



C



D
5

2 The table is about the features of clay soil and sandy soil.

<u>CLAY SOIL</u>	<u>SANDY SOIL</u>

Put the statements about clay soil and sandy soil into the correct column in the table.

cold in Spring

heavy to dig

well aerated

drains quickly

consists of small particles

small air spaces

[3]

3 Some people are concerned that the growing of GM crops may affect the wild flowers growing in hedgerows.

What is the most likely reason for their concern?

A Disease from GM plants infects wild flowers.

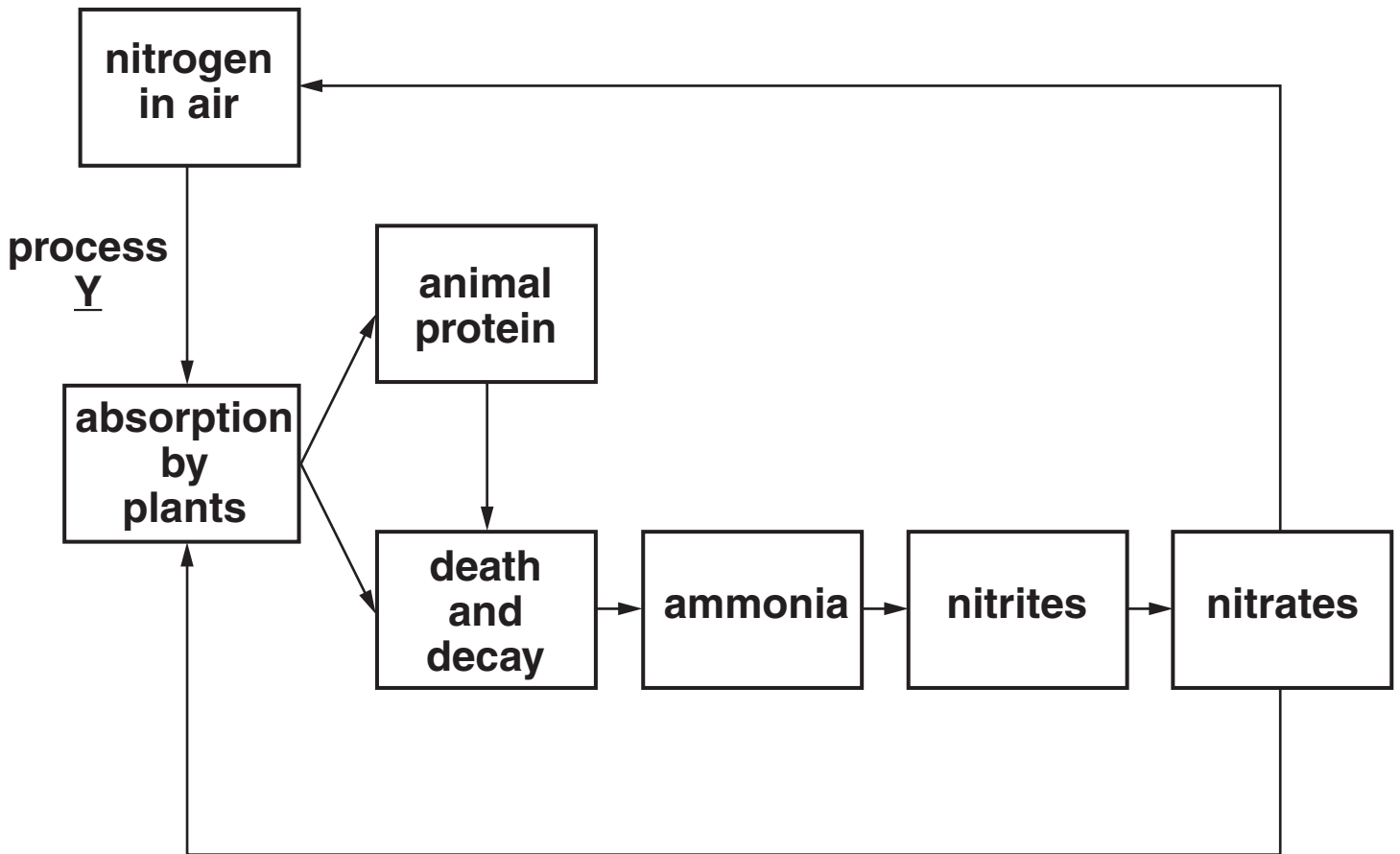
B Leaves from GM plants shade wild flowers.

C Pollen from GM plants pollinates wild flowers.

D Roots from GM plants compete with wild flowers.

Answer A, B, C or D _____ [1]

4 The diagram shows stages in the nitrogen cycle.



What is process Y?

- A decomposition
- B fixation
- C nitrification
- D respiration

Answer A, B, C or D _____ [1]

5 Which statement is true for ALL vegetables that are produced as 'organic'?

A They are grown without using fertiliser.

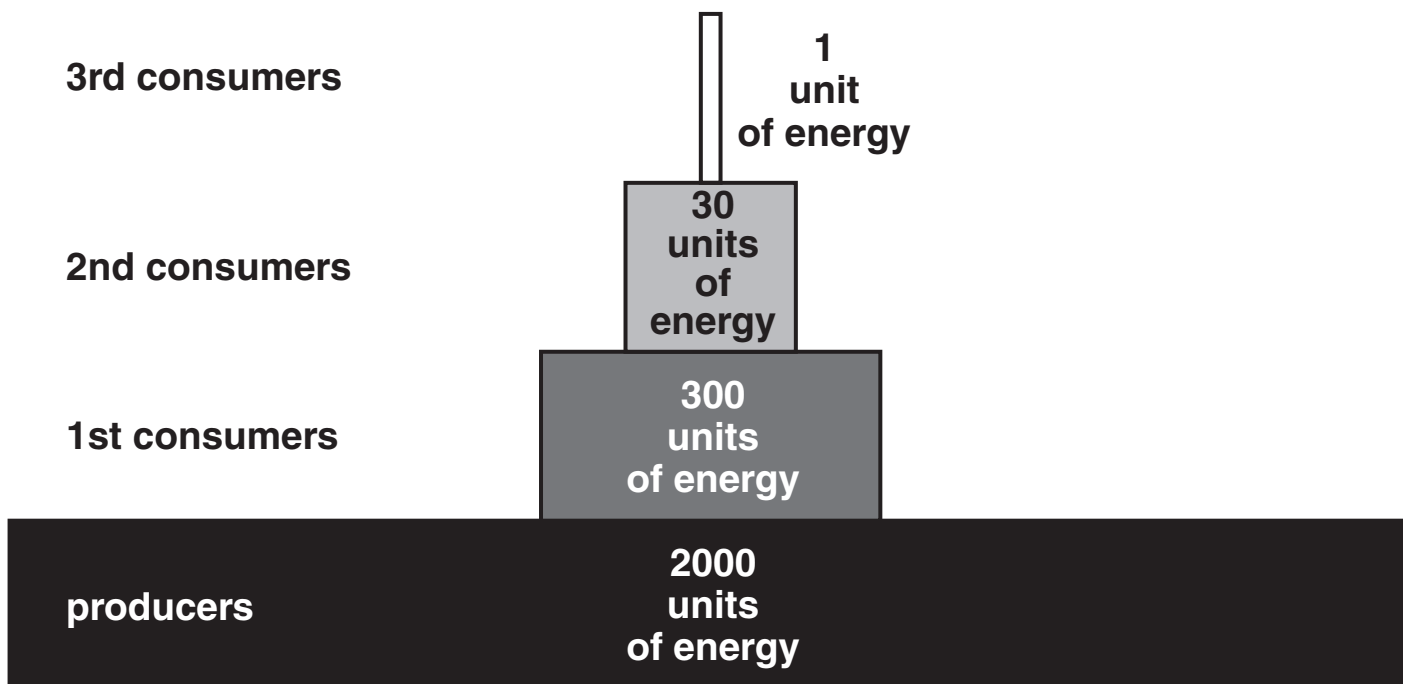
B They are grown without using chemical herbicides.

C They are grown from old natural varieties.

D They are grown in loam soil with a lot of organic matter.

Answer A, B, C or D _____ [1]

6 The diagram shows a pyramid of energy.



Choose TWO words from the list below to complete the following sentence.

ASSIMILATION

EXCRETION

EVAPORATION

FIXATION

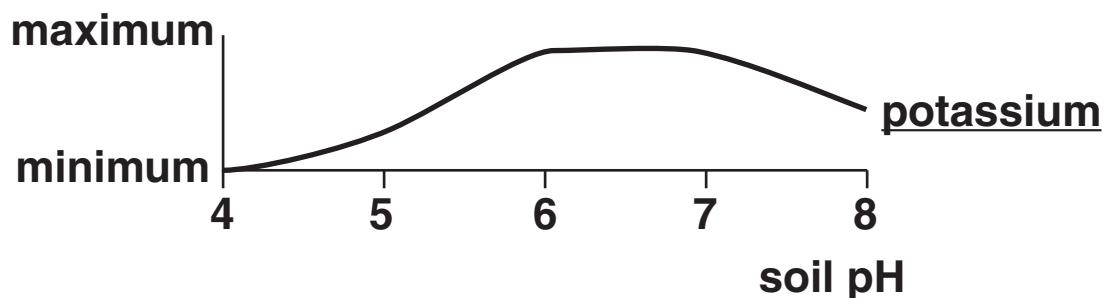
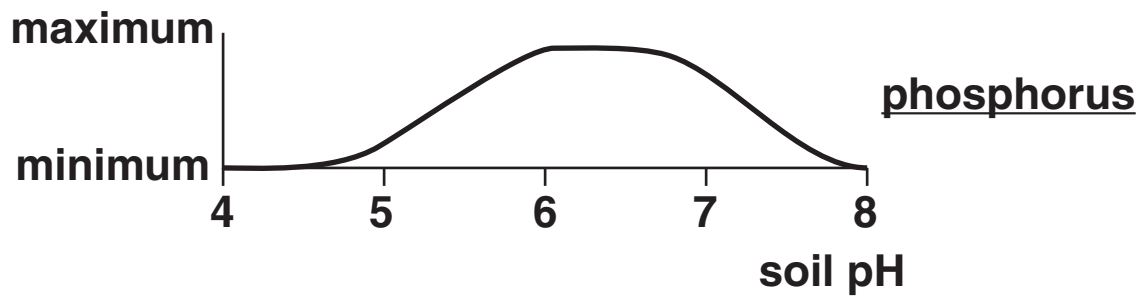
RESPIRATION

Energy is 'lost' at each stage of the food chain through

and _____ .

[2]

- 7 The graphs show how the availability of phosphate ions and potassium ions changes with soil pH.

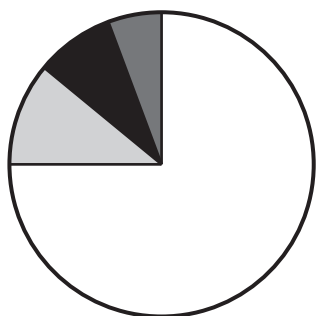


How would adding lime to a soil of pH 7 affect the availability of phosphate and potassium ions?

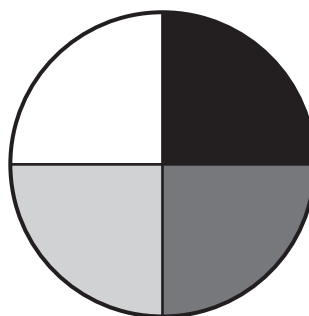
- A** availability of phosphate and potassium ions remains the same
- B** both phosphate and potassium ions become less available
- C** both phosphate and potassium ions become more available
- D** phosphate ions become more available, potassium ions become less available

Answer **A**, **B**, **C** or **D** _____ [1]

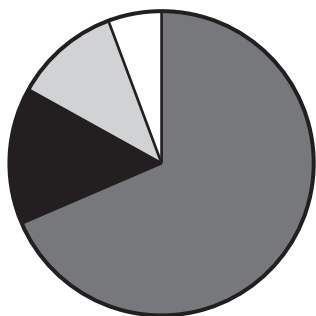
8 The pie charts show the composition of four soils.



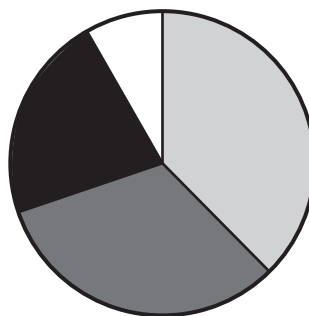
A



B



C



D



clay



silt



fine
sand



coarse
sand

Which pie chart represents a loam soil?

A

B

C

D

Answer A, B, C or D _____ [1]

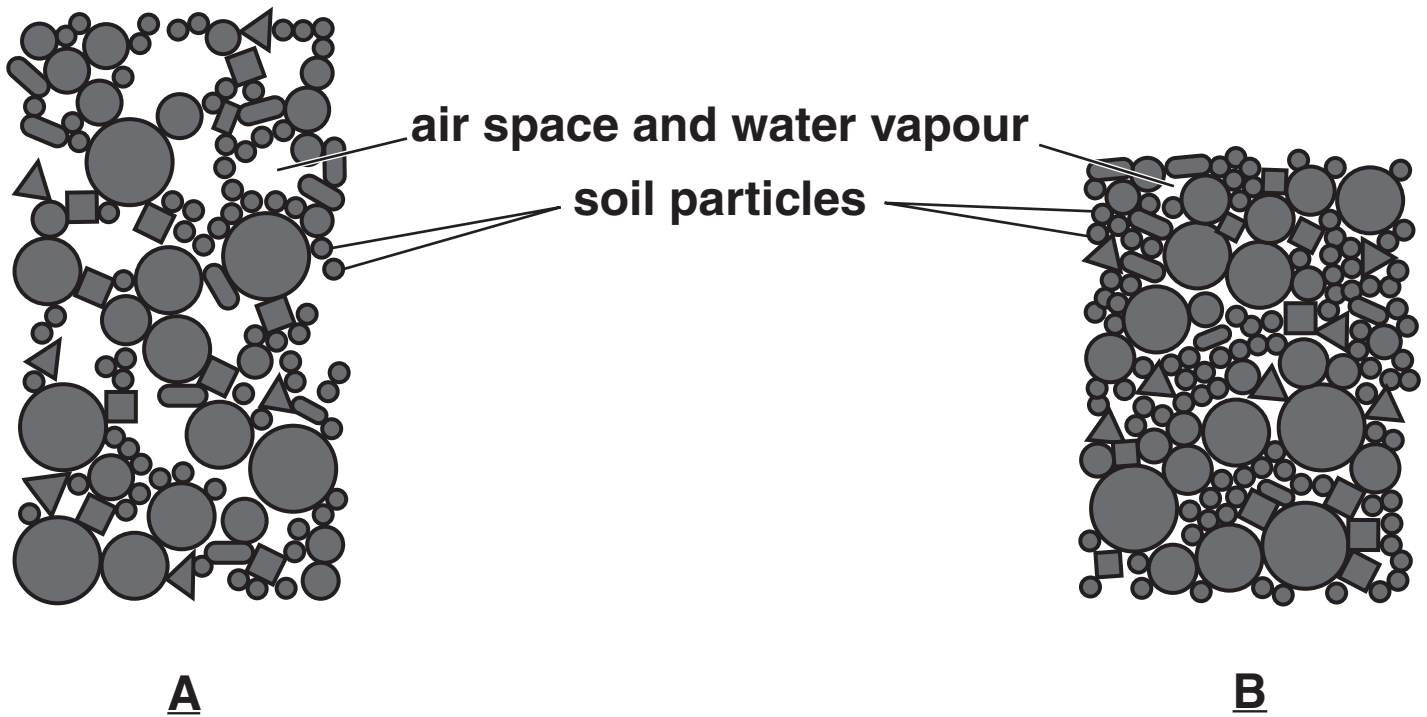
9 Give TWO ways earthworms help to maintain the soil environment.

1 _____

2 _____

_____ [2]

10 The diagram shows two soil habitats in profile.
Soil in diagram B is compacted.
This was caused by the use of heavy farm machinery.



State TWO ways the farmer could reduce compaction of the soil when using heavy machinery.

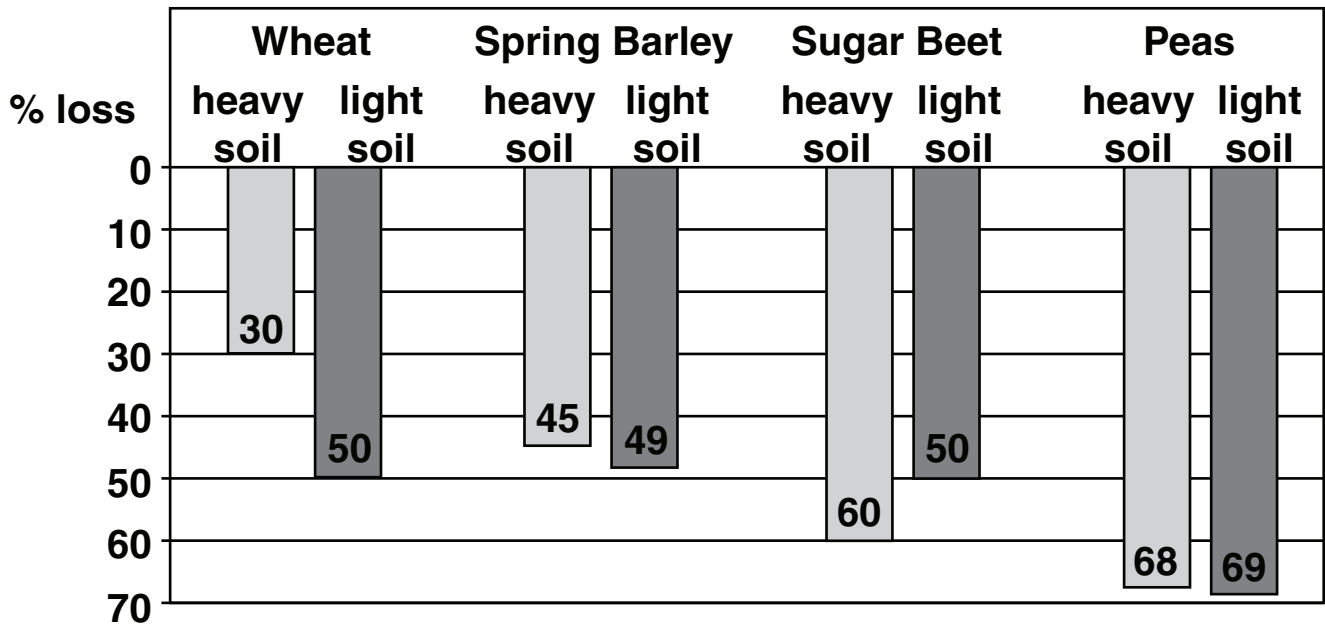
1 _____

2 _____

_____ [2]

11 Soil compaction reduces crop yields.

The bar chart compares the percentage loss of yield in four crops when grown in heavy and light compacted soils.



- (a) Consider the yield of the four crops in heavy and light soils.
State TWO conclusions the data shows about crop yields in heavy and light soils.**

1 _____

2 _____

[2]

- (b) Soil compaction reduces yields most in Peas, a legume crop.**

Suggest a reason for this.

[1]

12 The Government has produced a leaflet to advise on 'best practice' when using pesticides on the farm.

(a) State TWO precautions that can be taken when applying pesticide in order to protect the environment and water courses.

1 _____

2 _____

_____ **[2]**

(b) Pesticides can be dangerous to people using them.

Suggest THREE different precautions that might be included in a PERSONAL RISK assessment before using the pesticide.

1 _____

2 _____

3 _____

_____ **[3]**

13 'Green belts' are the areas of countryside on the edges of large towns.

For fifty years the Government has prevented any building on 'green belt' land to prevent 'urban sprawl'.

There are now proposals to allow building on the 'green belt'.

Explain why this could lead to both local flooding and a lack of water resources.

[2]

14 A school keeps an accident book for use with field trips.

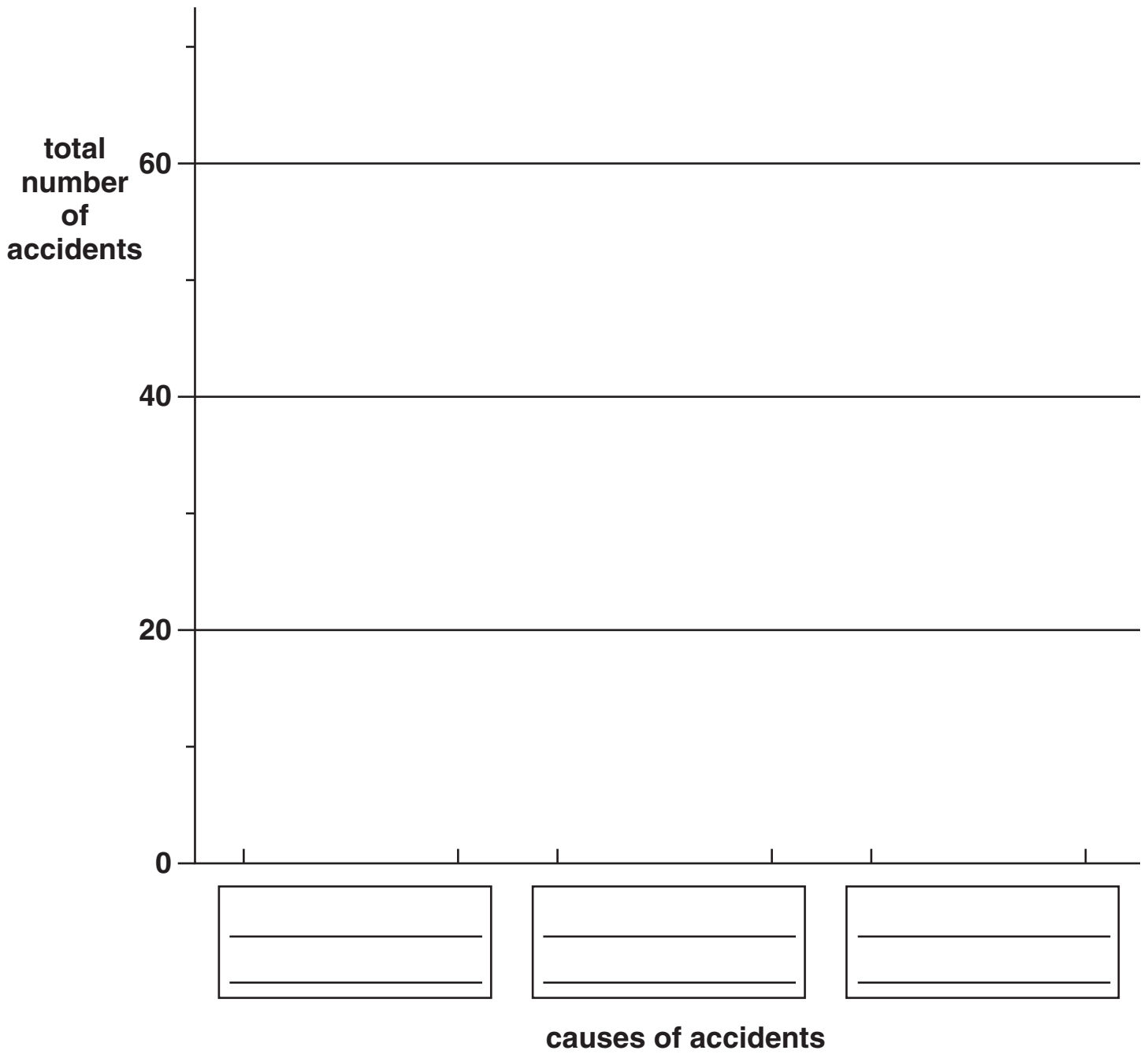
The table shows the number and nature of accidents which happened over several years.

<u>CAUSES OF ACCIDENTS</u>	<u>LEVELS OF INJURIES SUSTAINED</u>		
	<u>SERIOUS</u>	<u>MINOR</u>	<u>NO INJURY</u>
poor behaviour	3	19	38
not following instructions	5	15	20
misuse of equipment	12	6	2

(a) What was the OVERALL percentage of accidents which resulted in no injury?

_____ [1]

(b) Complete the bar chart to show the total number of accidents that resulted from each cause.



[2]

15 A heat pump is a new alternative method of heating a house.

Heat from the soil is taken up by water in underground pipes.

These pipes connect to the house heating system.

Heat pumps are an example of an alternative energy source.

Describe THREE other forms of alternative energy that may be used to produce electricity.

1 _____

2 _____

3 _____

[3]

16 A pesticide used on a crop got into the nearby water course.

Small water organisms and fish were unaffected but large birds, which ate fish, died.

Explain why the pesticide killed the birds but not the fish.

[2]

17 Salt marsh vegetation is spreading in the Humber estuary.

This wetland vegetation is protected under British and EU law.

The vegetation has begun to invade the nearby holiday beaches.

Natural England would like to protect the salt marsh.

Local councillors want to protect the beach.

Imagine you are EITHER an official of Natural England OR a local councillor.

Outline the argument you would use to support your case.

[3]

END OF QUESTION PAPER

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