

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE**

B682/02

**ENVIRONMENTAL AND
LAND-BASED SCIENCE**

**Plant Cultivation and Small
Animal Care (Higher Tier)**

MONDAY 15 JUNE 2015: Morning

**DURATION: 1 hour
plus your additional time allowance**

MODIFIED ENLARGED

| | | | |
|-------------------------------|--|------------------------------|--|
| Candidate forename | | Candidate surname | |
|-------------------------------|--|------------------------------|--|

| | | | | | | | | | | |
|--------------------------|--|--|--|--|--|-----------------------------|--|--|--|--|
| Centre number | | | | | | Candidate number | | | | |
|--------------------------|--|--|--|--|--|-----------------------------|--|--|--|--|

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Pencil

Ruler (cm/mm)

Calculator

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).

INFORMATION FOR CANDIDATES

The quality of written communication is assessed in questions marked with a pencil ().

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 50.

Any blank pages are indicated.

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Answer ALL the questions.

- 1 Some fruits and vegetables were tested for their magnesium content.**

The table shows the results of tests performed in 1930 and in 1980.

| | MAGNESIUM CONTENT (ARBITRARY UNITS) | |
|---------------------|--|-------------|
| | 1930 | 1980 |
| Carrots | 12 | 3 |
| Peas | 30 | 34 |
| Tomatoes | 11 | 7 |
| Bananas | 42 | 34 |
| Strawberries | 12 | 10 |

- (a) Describe how plants take in nutrients such as magnesium.**

[2]

(b) Calculate the percentage increase in the magnesium content of PEAS between 1930 and 1980.

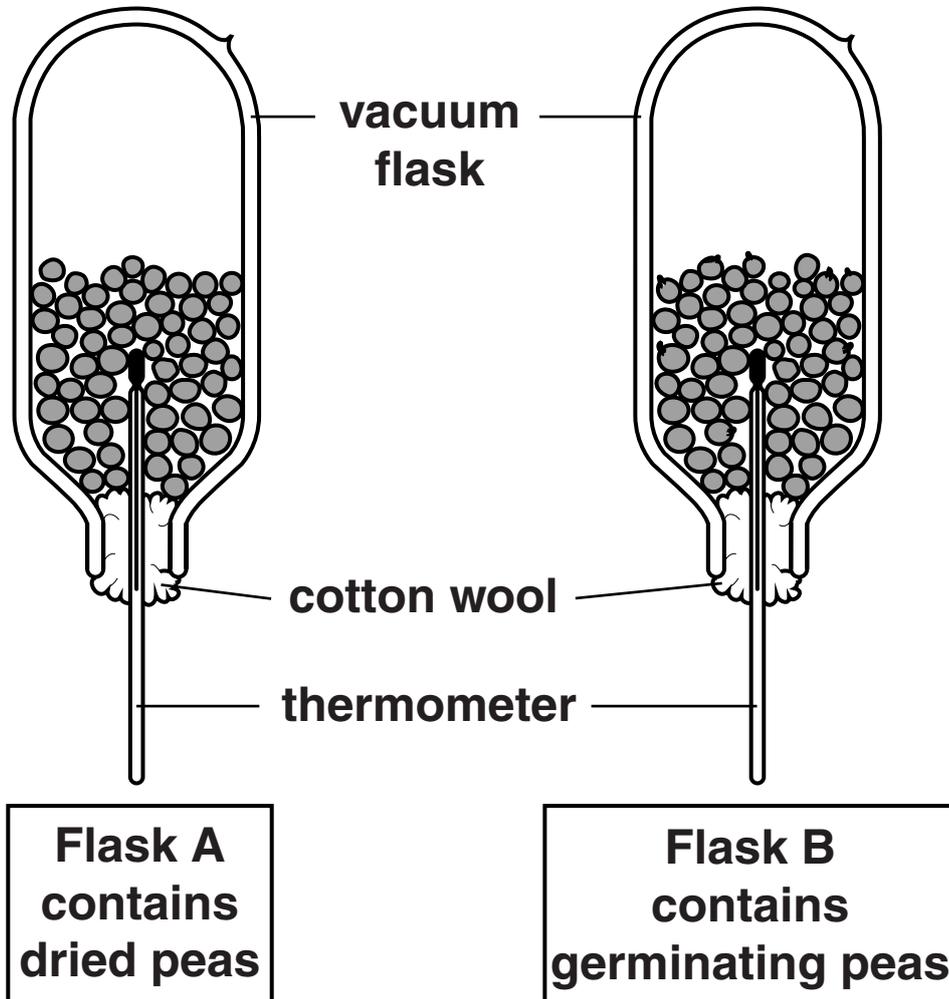
Answer _____ % [2]

(c) Suggest TWO reasons why the results in the table may NOT be valid.

[2]

[TOTAL: 6]

**2 A student was investigating germination in pea seeds.
The diagrams show how she set up her investigation.**



- (a) She left the vacuum flasks, A and B, in identical conditions for three days.**

Suggest what will have happened to the temperature in flasks A and B after three days.

Explain your answer.

[2]

- (b) A friend suggested that changes in room temperature may have affected her results.**

Do you agree? Explain your answer.

[1]

(c) Another student did a similar investigation using seeds of a different plant.

Unfortunately none of her seeds germinated.

Her teacher suggested that the seeds may be dormant.

What is meant by seed dormancy?

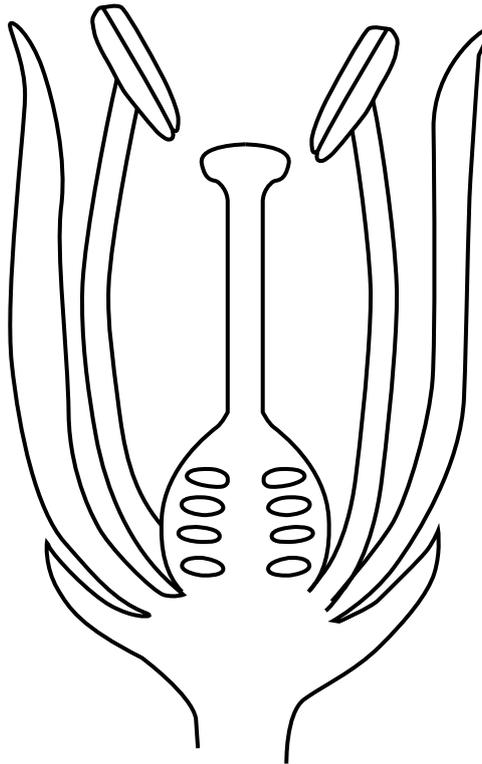
Suggest what the student could do to break seed dormancy.

[2]

[TOTAL: 5]

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3 The diagram shows a vertical section through a flower.



Plants can be self-pollinated or cross-pollinated.

Describe the differences between self-pollination and cross-pollination.

Explain how plants are adapted to prevent self-pollination and encourage cross-pollination.

4 Different varieties of apple have different characteristics.

The table shows information about four different varieties of apple, A, B, C and D.

| | VARIETY OF APPLE | | | |
|-----------------------------|-------------------------|----------|----------|----------|
| | A | B | C | D |
| Colour | green | red | green | red |
| Resistant to disease | no | yes | no | no |
| Large fruit | yes | no | no | no |
| Sweet fruit | yes | no | no | yes |

(a) Some varieties of apple are disease resistant.

The allele for disease resistance is recessive (r).

Apple variety A was crossed with apple variety B.

Fifty percent (50%) of the F1 generation were disease resistant.

Complete the genetic diagram below to show this cross.

| | | Gametes of apple variety A | |
|-----------------------------------|--|-----------------------------------|--|
| | | | |
| Gametes of apple variety B | | | |
| | | | |

[3]

(b) The different characteristics of these apple varieties could have arisen by mutation.

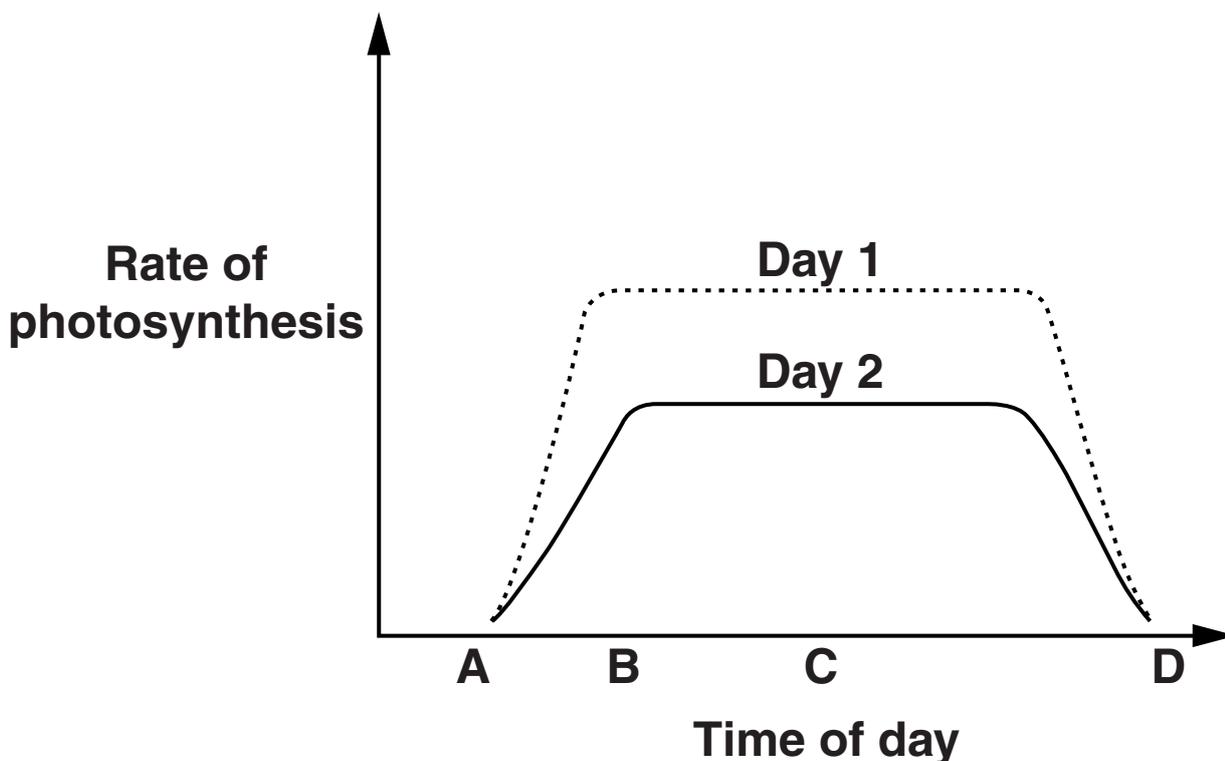
What is meant by the term mutation and suggest ONE possible cause of mutation.

[2]

[TOTAL: 5]

- 5 The rate of photosynthesis of an outdoor plant was measured on two different days.

The graph shows how the rate of photosynthesis changed.



- (a) Which letter represents the time of day when DAWN happens?

A

B

C

D

Tick (✓) one box only.

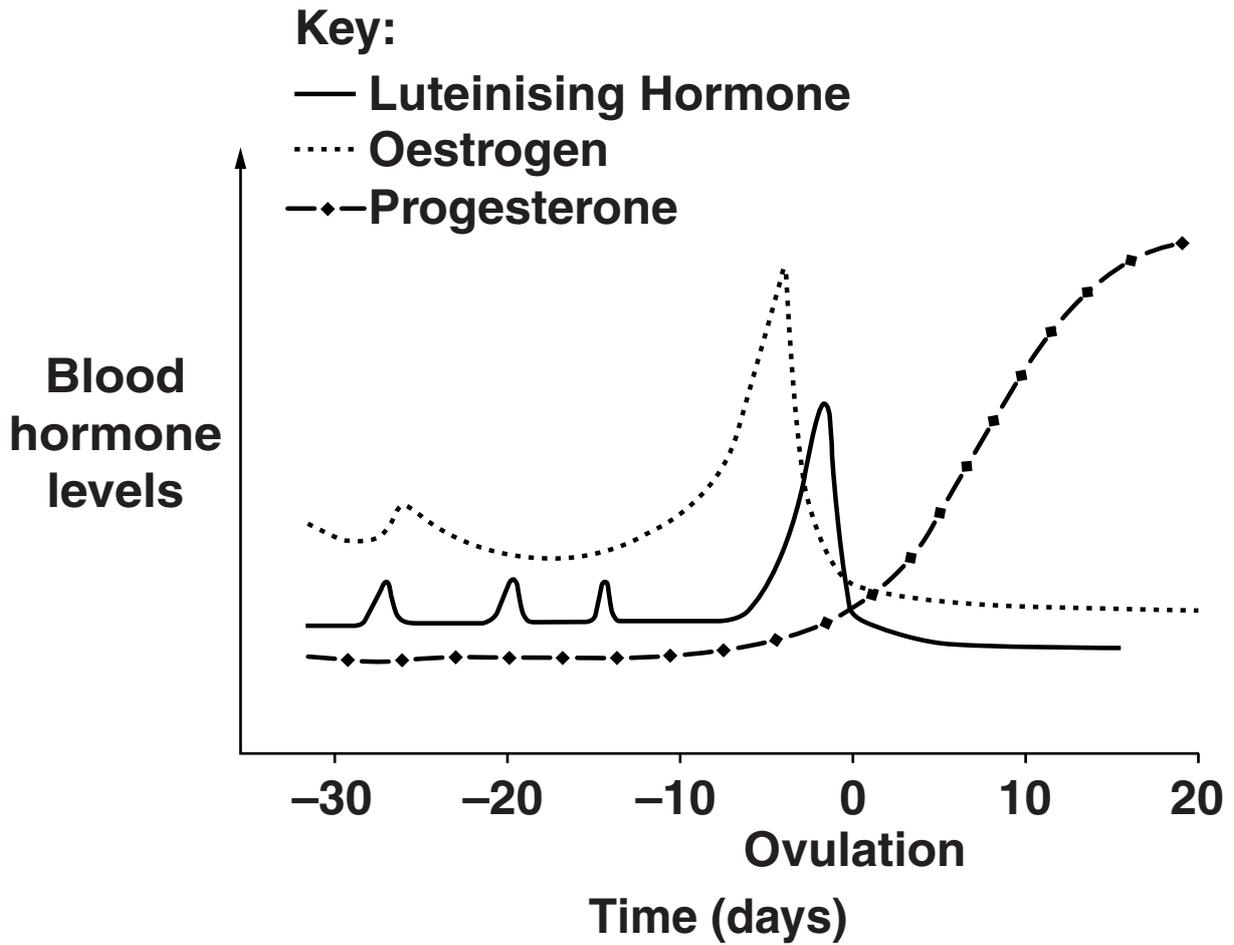
[1]

(b) Suggest why the graphs for DAY 1 and DAY 2 are different.

[2]

[TOTAL: 3]

6 The graph shows the changes in some hormone levels during oestrus in dogs.



(a) Describe the changes in hormone levels that stimulate ovulation in dogs.

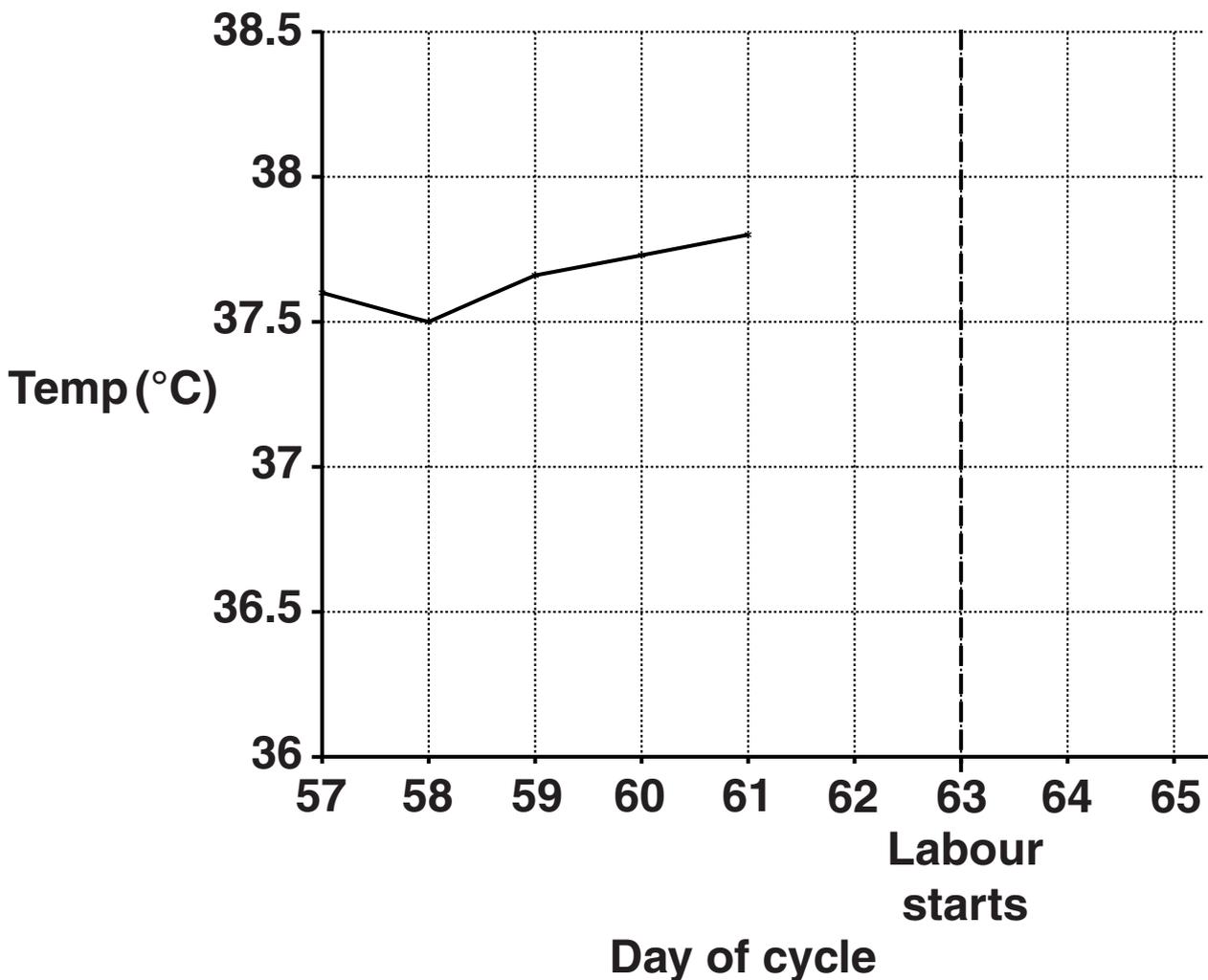
[2]

(b) The gestation period for dogs is 63 days.

Twenty-four hours before labour, a dog's body temperature will have increased to 38.5°C . During the next twenty-four hours the dog's temperature drops sharply to 36.6°C .

A dog's owner is monitoring a dog's temperature.

Complete the graph below to show the temperature changes that should occur before the dog goes into labour.



[2]

7 The label shows the ingredients in a dry dog food.

DOGGO BITES

Ingredient/Nutrient:

High-Quality Protein

Wholesome Grains

Omega 3 & 6 Fatty Acids

Calcium, Phosphorus and Vitamin A

Helps support:

Healthy Muscle Development

Energy for an Active Life

Shiny Coat, Healthy Skin

Strong Bones and Teeth

Also

Whole carrots, sweet potatoes and peas are three of the nutrient-rich vegetables that your dog will get in every bite

(a) This food contains roughage (fibre).

Give TWO reasons why roughage is important in the diet of small animals.

[2]

- (b) Dogs are carnivores so in the wild they would not naturally eat some of the ingredients shown on the label.**

Suggest how wild dogs might obtain these ingredients.

[2]

- (c) The table shows the amount of food that different breeds of dog need each day.**

| BREED | MASS OF AN ADULT DOG (kg) | AMOUNT OF DRY FOOD (CUPS PER DAY) |
|-------------------------|----------------------------------|--|
| Miniature Poodle | 12.5 to 25 | $\frac{1}{2}$ to 1 |
| Cocker Spaniel | 25 to 50 | 1 to 2 |
| Labrador | 50 to 75 | 2 to 3 |

- (i) One cup of food weighs 200 g.

Calculate the daily amount of dry food, in grams per kilogram of dog, for an adult Labrador.

Answer _____ grams per kilogram of dog [1]

- (ii) An owner carefully weighs out the dry dog food every day.

What is the name given to this type of feeding?

State an advantage of this type of feeding.

Type of feeding _____

Advantage _____

_____ [2]

[TOTAL: 7]

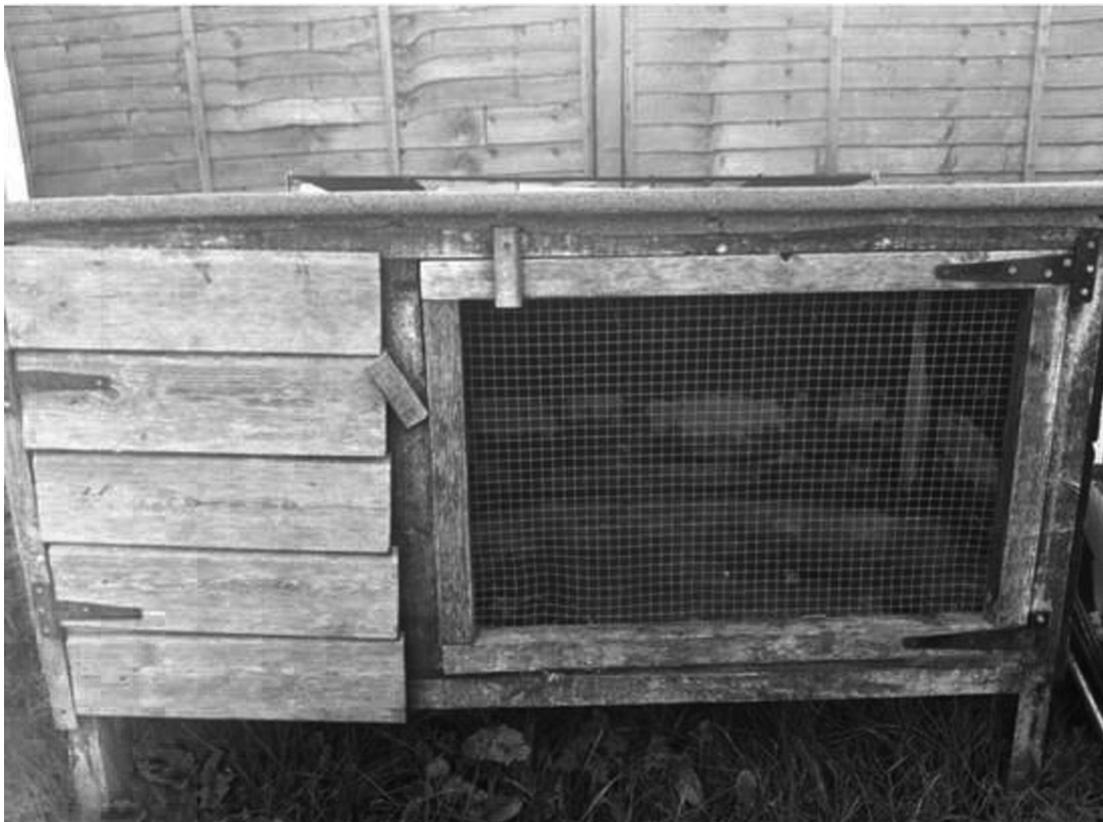
8 The photograph shows a pedigree guinea pig.



The owner of this guinea pig would like to take him to a show.

Describe with reasons the health and safety requirements and the legal requirements when transporting any small mammal.

- 9 The photograph shows an example of poor housing for a rabbit.



State TWO risks associated with poor housing for rabbits.

[2]

[TOTAL: 2]

END OF QUESTION PAPER

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