OCR
Oxford Cambridge and RSA

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Monday 15 June 2015 – Morning

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B682/02 Plant Cultivation and Small Animal Care (Higher Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Pencil
- Ruler (cm/mm)
- Calculator

Duration: 1 hour

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. 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).
- Do **not** write in the bar codes.

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**.
- This document consists of **16** pages. 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.

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..... **[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.

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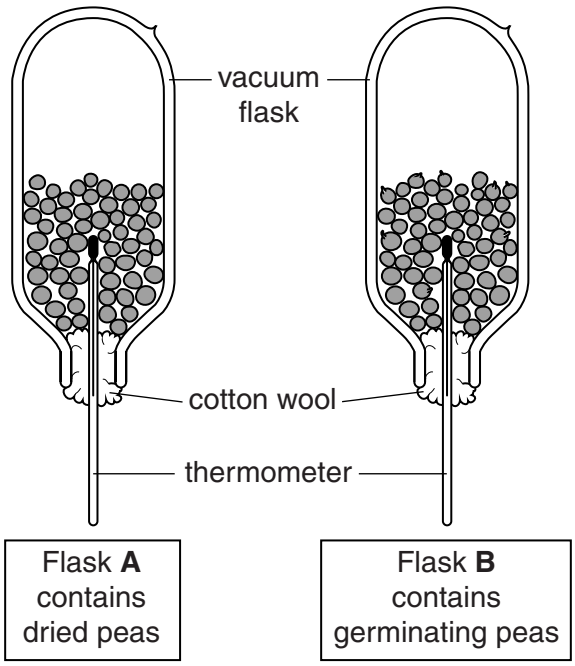
..... **[2]**

[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.

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..... **[2]**

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

Do you agree? Explain your answer.

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..... **[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.

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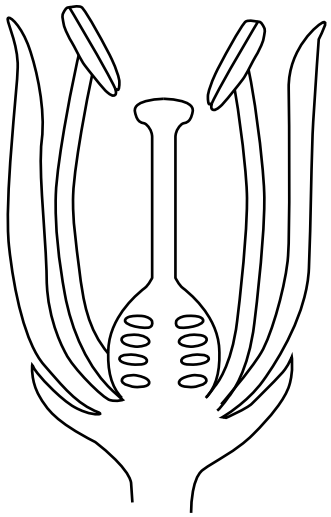
..... **[2]**

[Total: 5]

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.

The quality of written communication will be assessed in your answer.

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[Total: 6]

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.

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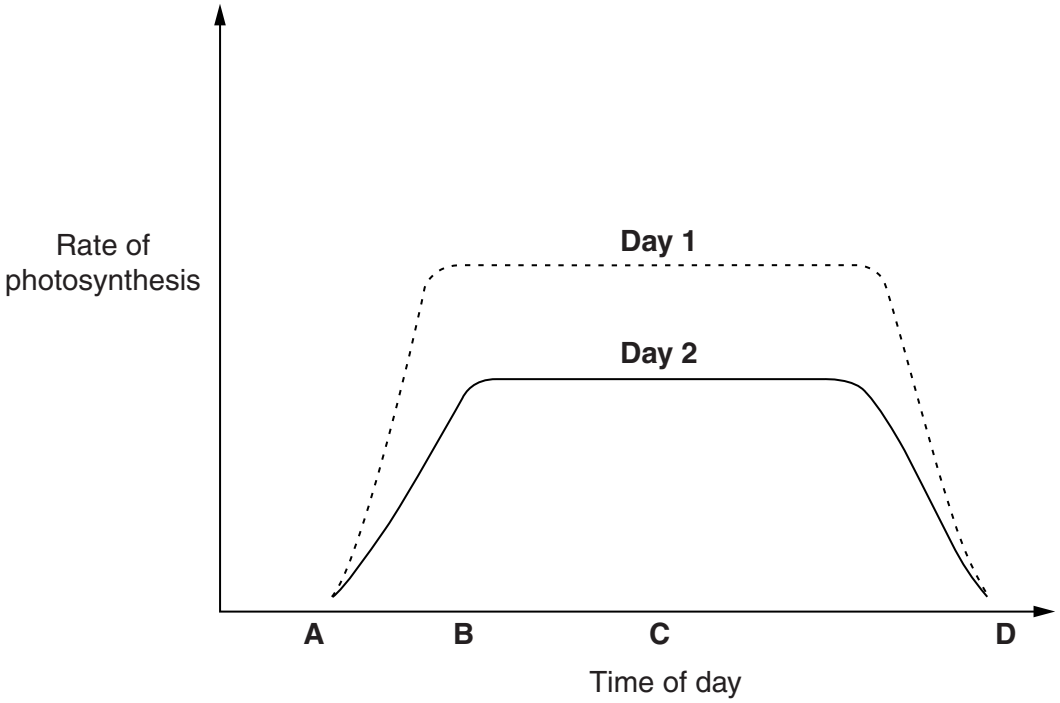
..... **[2]**

[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.

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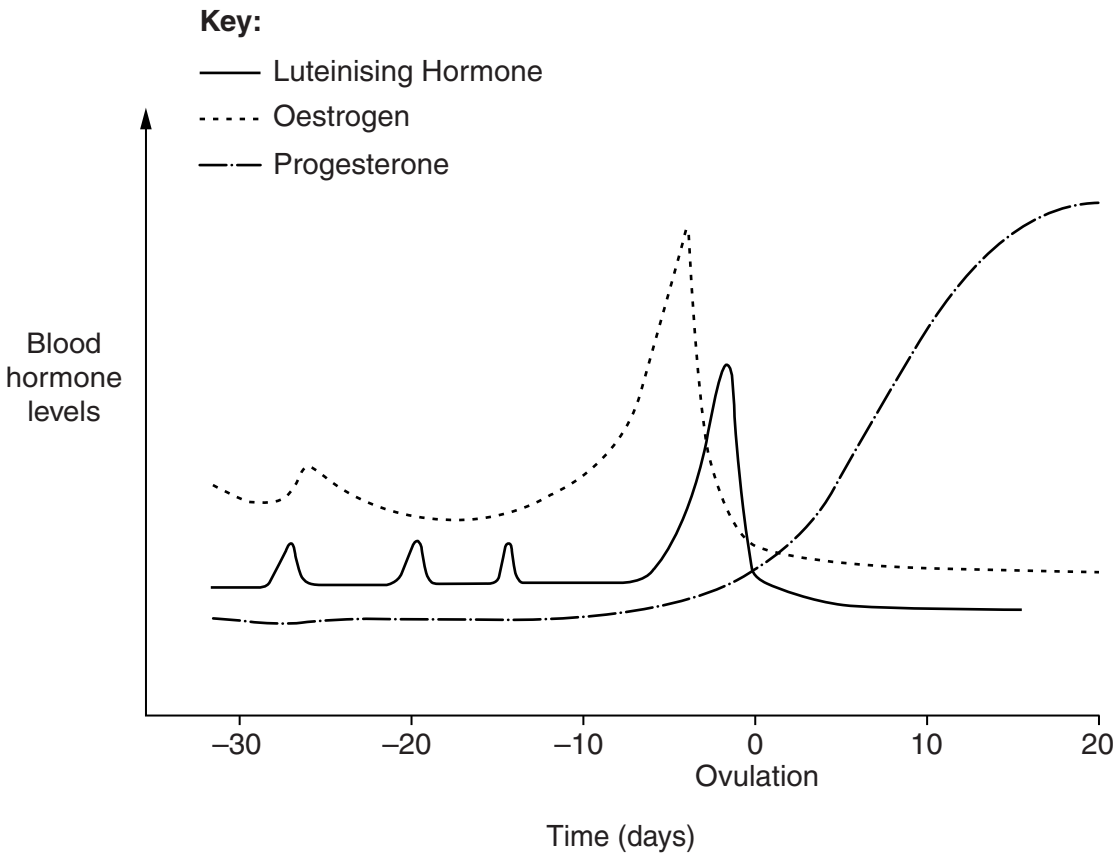
..... **[2]**

[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.

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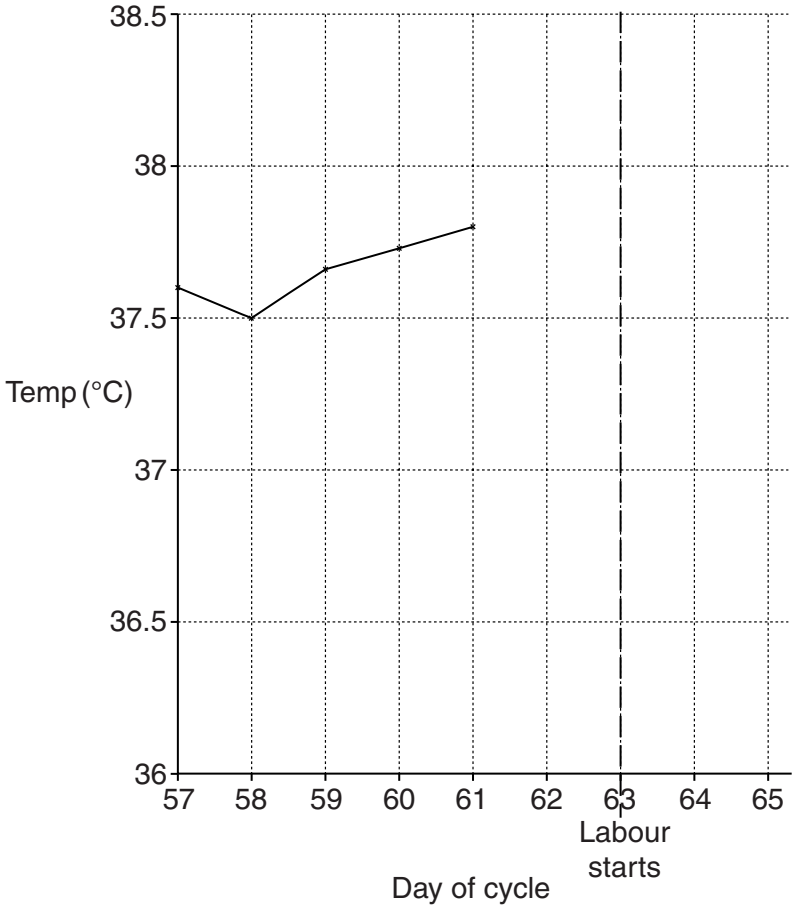
..... **[2]**

(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]

(c) The birthing process is similar in most small mammals.

For a dog, or other small mammal that you have studied:
Describe and explain what happens to the mother animal in the few hours immediately after giving birth to her young.

The quality of written communication will be assessed in your answer.

Name of small mammal: .....

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[Total: 10]

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

Doggo Bites

Ingredient/Nutrient:	**Helps support:**
High-Quality Protein	Healthy Muscle Development
Wholesome Grains	Energy for an Active Life
Omega 3 & 6 Fatty Acids	Shiny Coat, Healthy Skin
Calcium, Phosphorus and Vitamin A	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.

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(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.

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(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.

The quality of written communication will be assessed in your answer.

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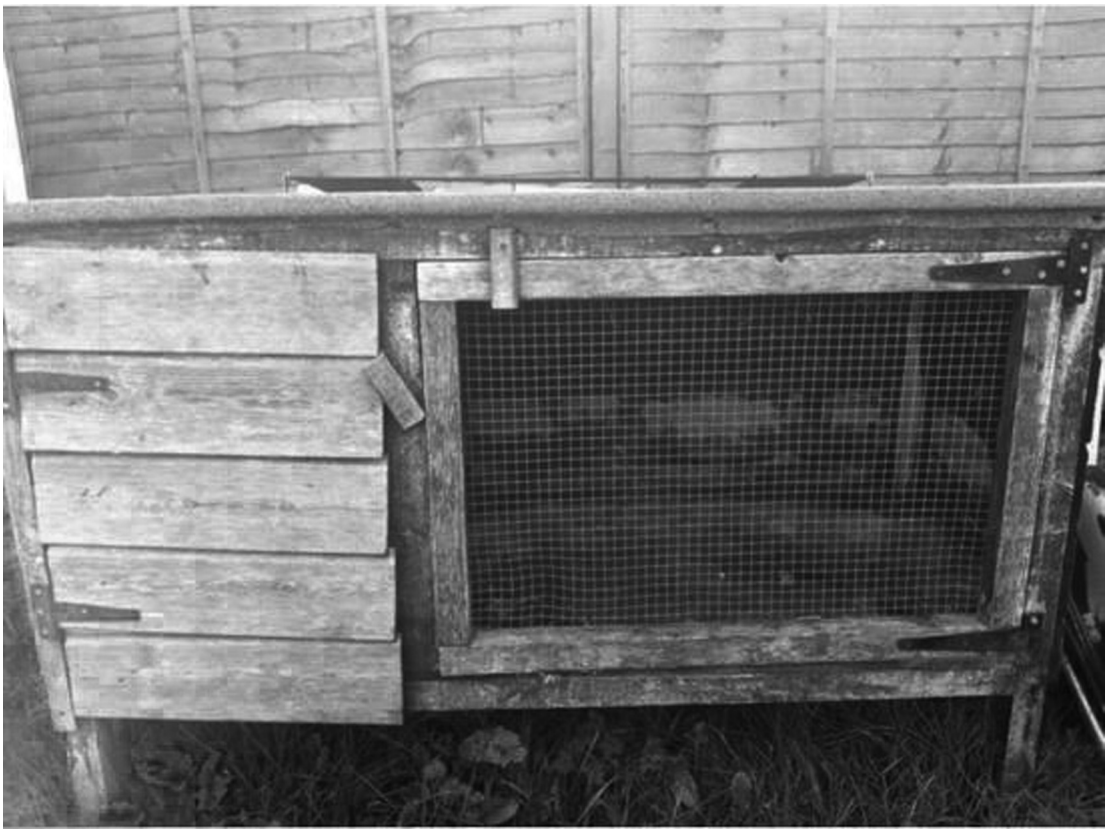
[Total: 6]

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



State **two** risks associated with poor housing for rabbits.

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[Total: 2]

END OF QUESTION PAPER

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