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**Monday 16 June 2014 – Morning**

**GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE**

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



Candidates answer on the Question Paper.  
A calculator may be used for this paper.

**OCR supplied materials:**

None

**Other materials required:**

- Pencil
- Ruler (cm/mm)

**Duration: 1 hour**



Candidate forename					Candidate surname				
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Centre number						Candidate number			
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**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 (-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 **20** pages. Any blank pages are indicated.

Answer **all** the questions.

1 The photograph shows Rebecca adding some dead plant material to her garden compost.

Rebecca left the compost for 12 months to decay.



How do you suggest she uses the garden compost after it has decayed?

Give a reason for your answer.

.....

.....

.....

[2]

**[Total: 2]**

2 After crops have been harvested, they are stored.

Pests can sometimes destroy crops during storage. A farmer has decided to spray his stored crop with a pesticide.

	Pesticide				
	A	B	C	D	E
<b>Toxicity to the insect pest (how well it kills insects) (+++++ very toxic)</b>	++	+	++++	+	+++++
<b>Cost per litre (£ = 25p)</b>	£	££££	£££	££	££
<b>How many months it remains effective</b>	5	3	3	4	2

The farmer decides to buy pesticide E.

(a) How much would he pay for 100 litres of pesticide E?

Answer £ ..... [1]

(b) 100 litres of pesticide E can treat 100 m<sup>3</sup> of stored crop. The crop is stored for 10 months.

(i) How many times will the farmer need to treat the crop over the 10 month period?

Answer ..... times [1]

(ii) The farmer has stored 1275 m<sup>3</sup> of crop.

Calculate the cost of treating this crop for 10 months.

Answer £ ..... [1]

(c) The farmer was not happy with spending money on pesticides.

Using a named example of a crop, suggest a different way in which he could increase the crop's storage life and explain how it works.

Name of crop .....  
 .....  
 .....  
 ..... [2]

[Total: 5]  
Turn over

3 Describe the different ways that plants can reproduce **asexually**.

Explain the advantages and disadvantages of asexual reproduction of plants.



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

[6]

. [6]

[Total: 6]

4 It is estimated that there are 450 000 different species of flowering plant in the world today.



78% of flowering plants are pollinated by insects.

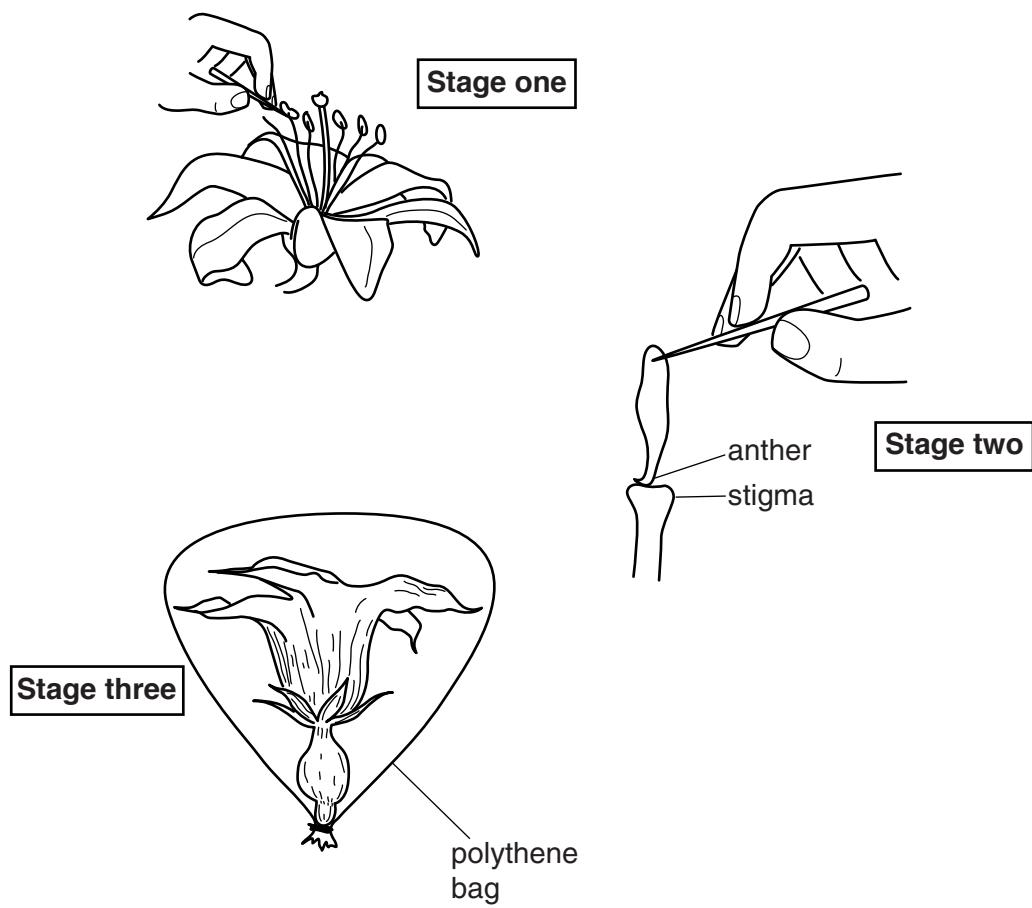
How many species of flowering plants is this?

Answer ..... [1]

[Total: 1]

5 It is possible to artificially control breeding in plants.

The diagrams show the sequence of events in cross-breeding plants.



Describe what is being done at each stage and explain why each stage is required.

.....

.....

.....

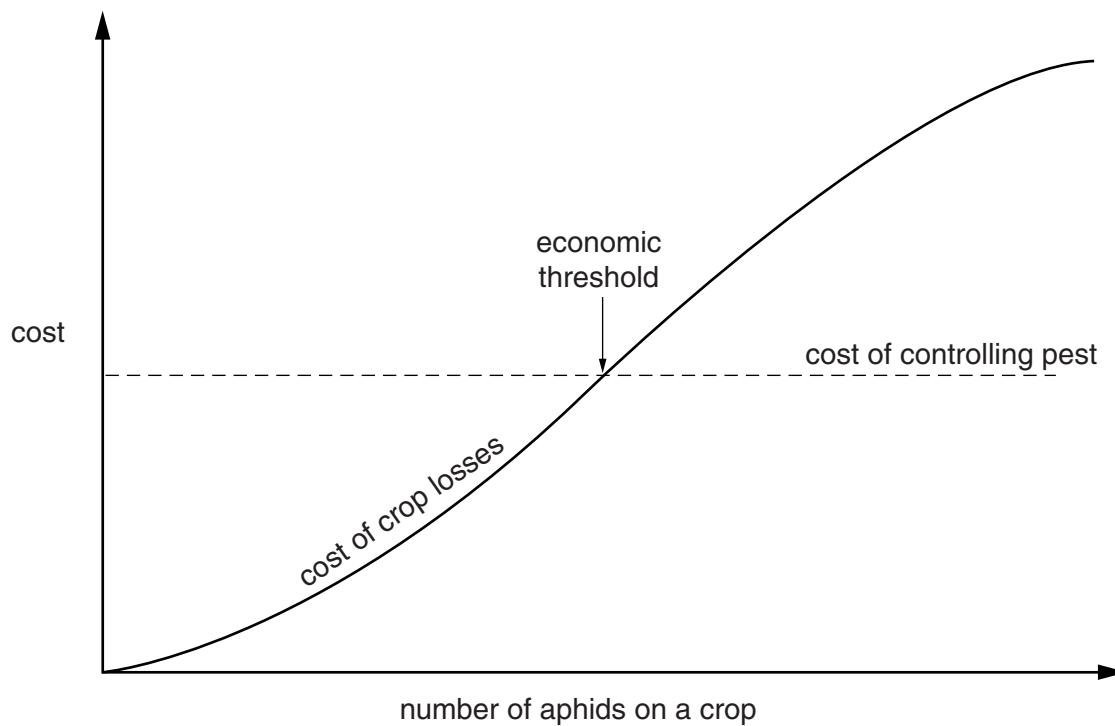
.....

[3]

[Total: 3]

6 Aphids are crop pests. They can be controlled by spraying with pesticide.

The curved line on the graph shows how increasing numbers of aphids on a crop increases the cost of crop losses.



Explain the importance of the economic threshold, as shown on the graph.

.....

.....

.....

[2]

[Total: 2]

7 Sugar beet is commonly grown in the UK.

One of the main problems for sugar beet growers is a virus that causes 'Yellows disease'.

This virus is carried by aphids from one sugar beet plant to another.

How do aphids transfer the virus between sugar beet plants?

.....

.....

.....

[2]

[Total: 2]

8 The photograph below shows a system for watering plants.

The instructions for use are as follows:

'Fill the tray with water and sit the plant pots on top. Use only flat bottomed pots.'



(a) What is the name given to this type of watering system?

..... [1]

(b) Use your knowledge of how this system works to explain why only flat bottomed pots should be used.

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

(c) It costs £3.95 per m<sup>2</sup> to buy this system. A grower wants to install it in a 6 m × 4 m area of the glasshouse.

Calculate the cost of installing this system.

Cost: £ ..... [1]

[Total: 4]

## 10

9 Owners need to consider more regular health checks for their pets when the pets reach middle age.

The chart below shows the stages in a dog's life.

Years	Equivalent dog age			Life stage
	Small breed	Medium breed	Large breed	
1	5	6	7	Puppy
2				
3			21	Adolescence
4		24		
5	25			
6				
7			49	
8	40	48	56	
9	45	54	63	
10	50	60	70	
11	55	66	77	
12	60	72		
13				
14			98	
15	75			
16				
17		102		
18				
19				
20	100			

Suggest why older pets need more health checks.

Describe what health checks the owner and vet might do.

Give reasons for your answer.



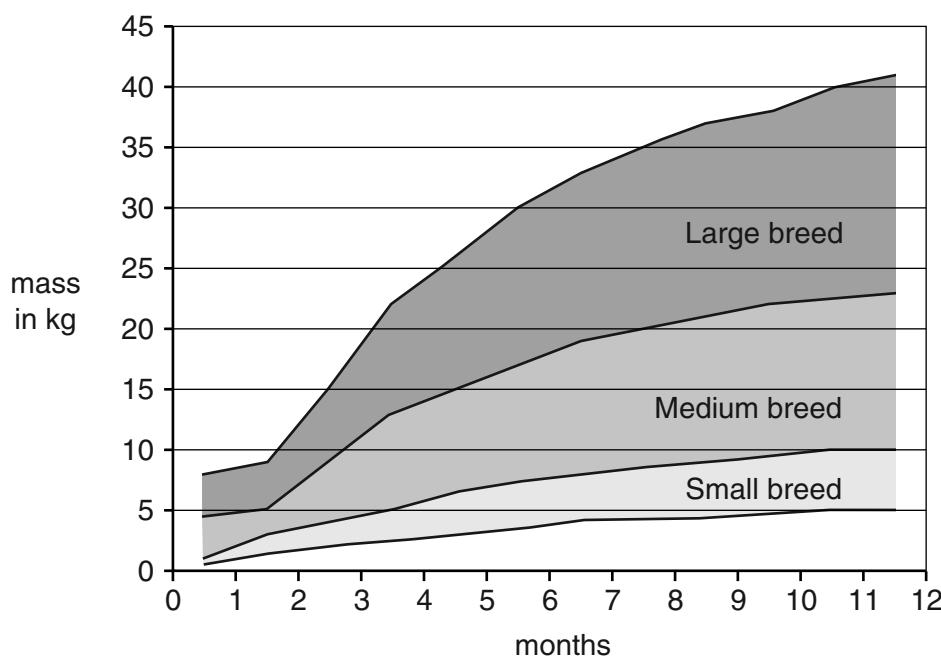
*The quality of written communication will be assessed in your answer.*

[6]

[Total: 6]

12

10 This body mass chart is for puppies up to 12 months old.



Jane has an 8 month old puppy with a mass of 10kg.

It is classed as a small breed of dog.

She is concerned about its body mass and takes it to the vet. The vet tells her not to worry.

Discuss why their opinions differ. Use the data from the graph to support your answer

.....

.....

.....

..... [3]

[Total: 3]

13

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**Question 11 begins on page 14**

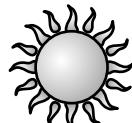
**PLEASE DO NOT WRITE ON THIS PAGE**

11 This information is found on the side of a packet of cat food.

It gives the recommended amount of food to be given to adult cats per day.

Size of cat in kg	Mass of food in g
2	25–40
3	40–60
4	55–75
5	70–95
6	80–115
7	95–130

feeding times:



$= \frac{1}{2}$  ration



$= \frac{1}{2}$  ration

**Mass of packet: 3 kg**

(a) A cat has a mass of 4 kg.

The owner of this cat feeds it the maximum amount of food each day.

How long will the packet of cat food last?

Answer ..... days [1]

**(b)** Animals can be fed a ration or ad lib.

Discuss the advantages and disadvantages of each system of feeding.

Use information from the table on page 14.



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

[6]

[6]

[Total: 7]

12 Birds of prey are carnivores.



A hawk's owner is feeding her bird of prey on beef steak only.

The bird becomes ill because of nutrient deficiency.

Explain why birds of prey, in the wild, are unlikely to suffer from nutrient deficiency.

.....

.....

.....

[2]

[Total: 2]

13 Some pets are overweight.

‘Lite’ versions of pet food are now available. These aim to prevent pets becoming overweight.



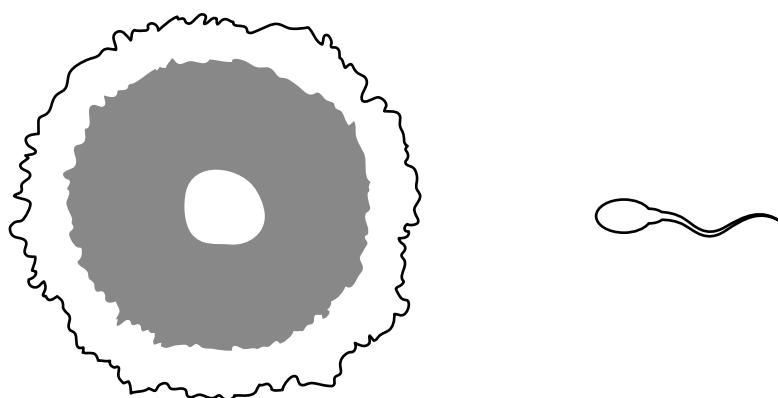
Name **two** nutrients which would be reduced in a ‘Lite’ pet food.

.....

[2]

[Total: 2]

14 The diagram shows a sperm swimming towards an egg.



(a) Describe what happens during fertilisation.

.....  
.....  
.....

[2]

(b) Where would fertilisation take place in a small mammal?

.....

[1]

[Total: 3]

19

15 Dalmatians are well known for their distinctive black or brown spotted coat.

Unfortunately, about 30% of Dalmatians have a genetic problem that results in some loss of hearing.



Suggest how this genetic problem could have arisen.

.....

.....

.....

[2]

[Total: 2]

**END OF QUESTION PAPER**

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