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Thursday 19 June 2014 – Afternoon

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B683/02 Commercial Horticulture, Agriculture and Livestock Husbandry
(Higher Tier)

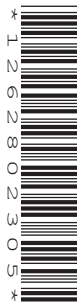
Candidates answer on the Question Paper.
A calculator may be used for this paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)

Duration: 1 hour



Candidate forename		Candidate surname	
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.

2

Answer **all** the questions.

- 1 The photographs show four trees used in parks and gardens.



All these trees are deciduous. This means they lose their leaves in the winter.

Deciduous trees are often planted along city streets.

Suggest problems caused by these trees losing their leaves.

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

[Total: 2]

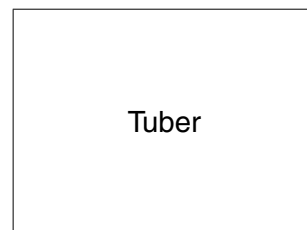
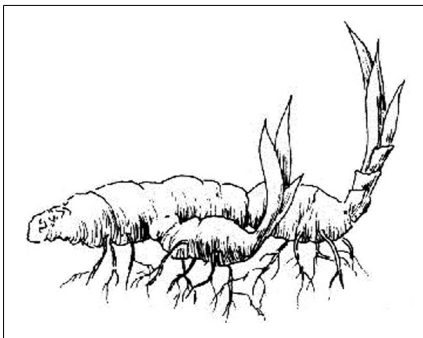
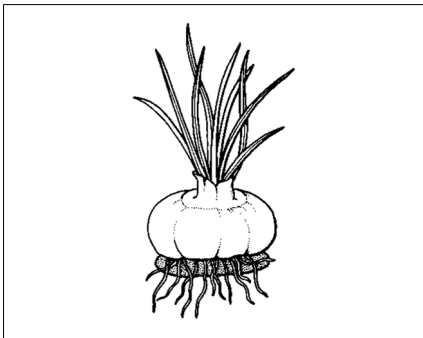
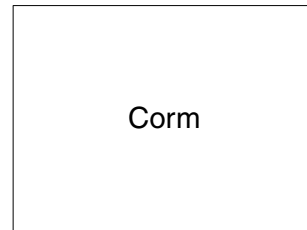
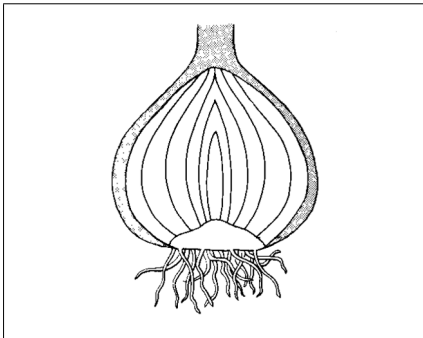
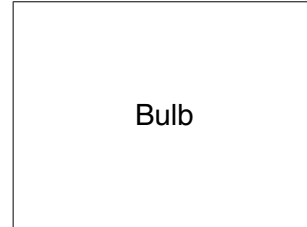
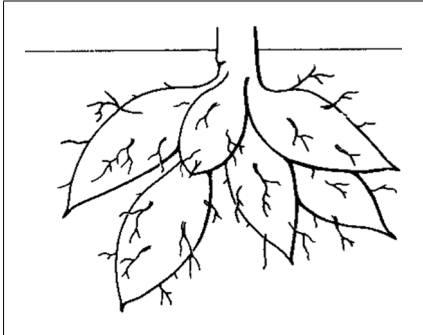
3

2 The diagrams show different vegetative structures of plants.

Draw a straight line from each **structure** to its correct **term**.

Structure

Term



[3]

[Total: 3]

Turn over

4

- 3 The photograph shows an aphid, a pest of many plants.



- (a) A female aphid produces 160 offspring in a two-week period and then dies.

If all these offspring reproduce at the same rate and no aphids die, how many would there be after a further two weeks?

Answer [1]

- (b) When considering pest control methods, the figure in your answer to part (a) could be used to argue for either biological or chemical pest control.

Give **one** reason for choosing each type of pest control.

I would choose biological pest control because

.....

I would choose chemical pest control because

.....

[2]

[Total: 3]

5

- 4 The photograph shows a range of different glasshouses.



Glasshouses are normally glazed with glass but increasingly, plastic is being used.

Other than **cost**, what are the advantages and disadvantages of each type of glazing material?

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.....

.....

..... [4]

[Total: 4]

6

- 5 (a) Many gardeners use heated propagators to help them grow young plants from seed.



Fungal diseases are more of a problem for young plants grown in propagators than for those grown outside.

Explain why.

.....

.....

.....

..... [3]

- (b) Grey mould is a fungal disease of tomato plants that are grown in glasshouses.



Grey mould is becoming resistant to chemical fungicides.

Scientists have developed biological control methods.

This table gives the results of different treatments on plants with grey mould.

Treatment	Area of leaf affected (%)	Plants surviving (%)	Yield per plant (kg)
control (no treatment)	4.4	86	4.5
fungicide (chemical)	2.4	91	4.5
Mycostop (biological)	2.5	83	5.4
TopShield (biological)	3.4	93	4.6
Bac-Pack (biological)	4.4	90	5.0

(i) Comment on the effectiveness of the different treatments as shown in the table.

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..... [3]

(ii) Why was a control used in this investigation?

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..... [1]

[Total: 7]

- 6 Auxin is produced in some plant buds.

Auxin is a plant hormone.



Explain the role of auxin in bud development.

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..... [2]

[Total: 2]

7 The photograph shows Forsythia.



Forsythia produces flowers on two-year-old wood.

Explain how Forsythia should be pruned to encourage flowering.

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..... [2]

[Total: 2]

The graph illustrates the historical and projected growth of the world's population. The x-axis represents the year from 1050 to 2050 in 50-year increments. The y-axis represents the population in billions, ranging from 0.0 to 10.0 in 1.0 billion increments. The population remains relatively stable at around 0.5 billion until the 18th century, after which it begins a rapid, exponential increase, reaching approximately 9.5 billion by 2050.

Year	Population (billions)
1050	0.2
1100	0.2
1150	0.2
1200	0.2
1250	0.2
1300	0.2
1350	0.2
1400	0.2
1450	0.2
1500	0.3
1550	0.4
1600	0.5
1650	0.5
1700	0.6
1750	0.7
1800	0.8
1850	1.2
1900	1.6
1950	2.5
2000	6.0
2050	9.5



..... [6]

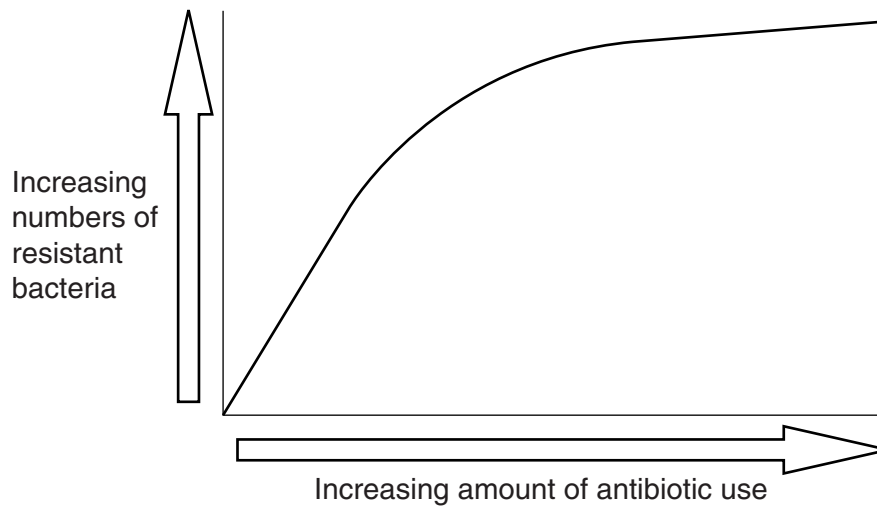
[6]

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- 9 Many farmers give antibiotics to their animals to keep them healthy.

Farmers know that 'resistant bacteria' will develop if antibiotics are used too often.

The graph shows how the numbers of antibiotic-resistant bacteria change with how often antibiotics are used.



Explain why the numbers of antibiotic-resistant bacteria increase as antibiotics are used more often.

.....

.....

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..... [3]

[Total: 3]

- 10 A farmer has a herd of cows producing below-average milk yield.



Suggest methods that the farmer could use to improve the milk yield of this herd.

Explain how these methods would improve milk yield.



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

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..... [6]

[Total: 6]

- 11 The table shows a range of different mineral supplements given to ewes.

Typical Analysis			
	Extra high energy	Standard	Super Sup
Energy in megajoules per kg	16	11	12
Sugar	30%	27%	33%
Protein	12%	3%	12%
Oil	14%	6%	6%
Calcium	2%	3%	4%
Magnesium	0.25%	0.3%	5%
Vitamin A	22.5 mg/kg	18.0 mg/kg	30.0 mg/kg
Vitamin D	0.375 mg/kg	0.3 mg/kg	0.5 mg/kg
Vitamin E	150 mg/kg	150 mg/kg	350 mg/kg

Which of these supplements would you give to ewes in late pregnancy and lactation?

.....

Explain your choice.

.....

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.....

.....

[3]

[Total: 3]

12 Weeds in grassland reduce the feed available for grazing livestock.

Farmers can deal with this problem either by:

- ploughing and re-seeding **or**
- spraying with selective herbicides.



- (a)** The application rate of herbicide is 4.0 litres per hectare on established grassland and 2.0 litres per hectare on new grassland.

The spray costs £12.50 per litre.

A farmer has 175 hectares of established grassland and 80 hectares of new grassland.

How much will it cost to spray all the fields?

Answer £ [2]

- (b)** Re-seeding established grassland costs £250 per hectare.

Use the data in part **(a)** to explain which is the more cost effective treatment:

- ploughing and re-seeding **or**
- spraying with selective herbicides.

.....
 [1]

[Total: 3]

15

13 Farmers can choose between extensive and intensive livestock systems.

They have to consider both the **economic** and **environmental** factors involved.

For a livestock system you have studied, compare the **economic** and **environmental** considerations of rearing livestock both intensively and extensively.



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

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..... [6]

[Total: 6]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE



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