THIS IS A NEW SPECIFICATION

OCR
RECOGNISING ACHIEVEMENT

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Tuesday 22 January 2013 – Morning

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

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

B634760113

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

B682 02

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

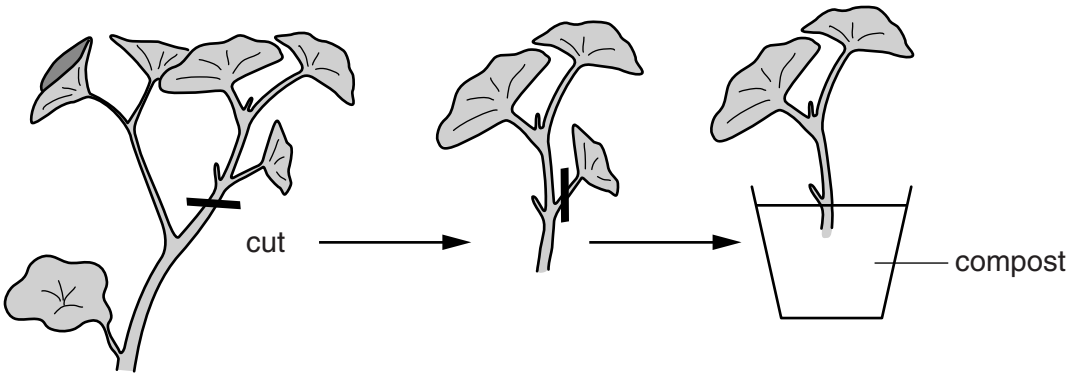
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting 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

- Your 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.

Answer **all** the questions.

1 The diagrams show how to take a softwood cutting.



1 **2** **3**

Diagram **2** shows the lower leaf being removed.

This is done to reduce:

A hormone levels

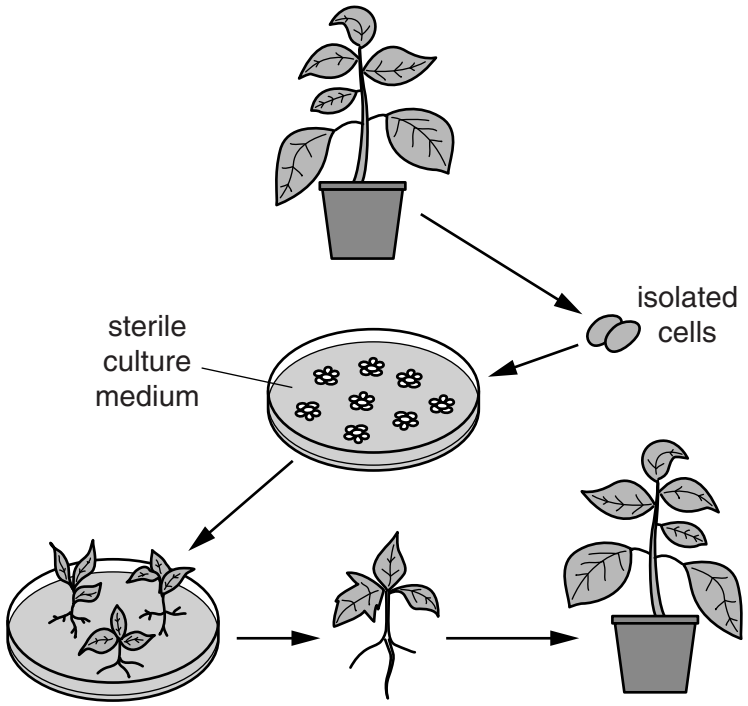
B photosynthesis

C respiration

D water loss.

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

2 The diagram shows the stages in tissue culture.



The isolated cells are placed on a sterile culture medium containing the following substances:

- glucose
- amino acids
- hormones
- antibiotics.

Choose any **two** of the components of the culture medium and explain why they are essential.

Substance 1 .....

Reason .....

.....

Substance 2 .....

Reason .....

.....

[2]

3 Tomato plants originate from South America.

When ripe, the original tomato fruits were small and green, and used mainly in cooking.

The fruits of modern varieties of tomato look and taste very different.

A red tomato fruit was produced by an original plant with green tomatoes.

This occurred due to a natural process.

Name this process.

..... **[1]**

4 Blight is a fungal disease which affects tomatoes and potatoes.

Some cultivated varieties of potato show resistance to blight.

Disease resistance can be inherited.

The allele for resistance is recessive to the allele for non-resistance.

A disease resistant potato plant was crossed with a non-resistant potato plant.

Complete the genetic diagram to show how disease resistance is inherited if **only half of the offspring were disease resistant**.

Use:

- **R** to represent the allele for non-resistance
- **r** to represent the allele for resistance.

parental phenotypes: resistant non-resistant

parental genotypes: [ ] [ ]

parental gametes: [ ] [ ] [ ] [ ]

Parental Gametes		

F1 generation genotypes: [ ] [ ]

F1 generation phenotypes: [ ] [ ]

[3]

5 Research was carried out to compare genetically modified (GM) crops with conventional crops.

Fields were divided into two.

Half of each field was sown with a GM crop, and half with a conventional crop of the same type.

The results are shown.

Crop type	Weed mass in g/m^2		Plant eating insects (mean number per sample)	
	Conventional	**GM**	**Conventional**	**GM**
Maize	8	14	11.57	15.58
Sugar beet	22	4	17.14	12.27
Oilseed rape	46	13	20.75	16.67

(a) Explain what is meant by the term genetically modified (GM) crop.

.....

..... **[1]**

(b) Explain which GM crop appears to be the least harmful to weeds and insects when compared with the conventional crop of the same type.

Use data from the table in your answer.

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.....

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

(c) Explain why the GM and the conventional crops were grown in two halves of the same field.

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

(d) Does this research show that GM maize is safe to grow and eat?

Explain your answer.

.....

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

6 This label is from a pesticide spray.

A gardener would rather use a biological control agent instead of Zimac to control pests.

(a) Using a **named example**, compare the use of a biological control agent with using Zimac pesticide in a glasshouse.

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

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..... **[6]**

(b) The warning on the label states that it is extremely dangerous to bees.

Why is this information more important to fruit farmers than to some vegetable farmers?

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..... **[1]**

7 A gardener buys some fertiliser for a lawn.

The label on the box reads:

BEST LAWN	
Compound Fertiliser 7-7-7	
Nitrogen (N)	**7%**
Total phosphorus pentoxide (P_2O_5)	**7%**
Soluble in water:	6.5%
Insoluble in water:	0.5%
Potassium oxide (K_2O)	**7%**

(a) What percentage (%) of phosphorus pentoxide will be available to the grass?

Answer ..... %

Explain your answer.

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[3]

(b) State **one** way that plant cells use phosphorus.

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..... **[1]**

8 These labels are from two different rabbit foods.

FEED BAG **A**

NORTH SPECIALITY FEEDS RABBIT MUESLI 1 kg	
PROTEIN	12%
OIL	3%
CALCIUM	12 mg/kg
IRON	10 mg/kg
VITAMINS A, C, D	trace
FIBRE	12%

FEED BAG **B**

NORTH SPECIALITY FEEDS RABBIT MUESLI 1 kg	
PROTEIN	16%
OIL	6%
CALCIUM	20 mg/kg
IRON	18 mg/kg
VITAMINS A, C, D	trace
FIBRE	12%

(a) These rabbit foods contain protein.

A rabbit is fed 120 grams of feed **A** each day.

How much more protein, in grams, will the rabbit get if it is fed feed **B** instead?

Answer ..... g
[1]

(b) Rabbits need food containing different nutrients depending on their age and lifestyle.

The two feeds, **A** and **B**, are suitable for rabbits at different stages of their lives.

Suggest, with reasons, at which stage of their lives the rabbits should be given each food.

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

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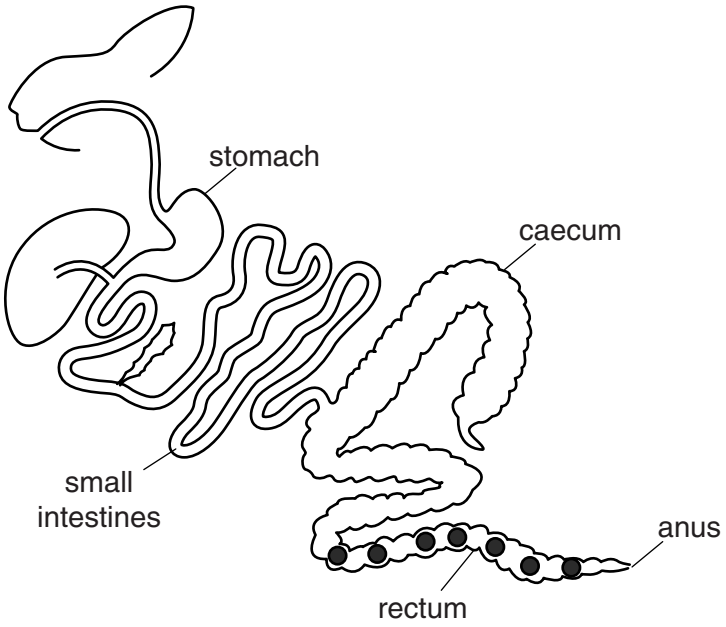
..... **[6]**

9 The diagram shows the digestive system of a rabbit.



The following is an extract from a magazine about rabbits.

> At certain times of the day (which coincide with several hours after a rabbit eats a big meal) the material from the caecum is packaged up into small round moist pellets. The rabbit gets a signal from its brain about when these pellets are ready to be passed out of the body. It eats them the minute they emerge.

Explain why it is necessary for rabbits to eat these pellets.

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..... **[3]**

10 Eggs can be hatched either artificially in an incubator or naturally under a broody hen.

(a) State **advantages** and **disadvantages** of artificial incubation.

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

(b) Different sized turkeys' eggs were incubated at three different temperatures.

Twenty eggs of each size were used at each temperature.

The table below shows the percentage of eggs of each size that hatched at each temperature.

Incubation temperature (°C)	**% of eggs hatching**			
	Eggs weighing 80 g–84 g	**Eggs weighing 85 g–89 g**	**Eggs weighing 90 g–94 g**	**Eggs weighing 95 g–99 g**
36.5	75	80	75	65
37.5	80	85	70	55
38.5	50	50	35	25

(i) Compare the hatching success of different sized eggs at different temperatures.

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..... **[1]**

(ii) Suggest an explanation (hypothesis) for these observations and how you could test your hypothesis.

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

11 Canine parvovirus is a disease of dogs that causes serious, often fatal, vomiting and diarrhoea, especially in young puppies.

It is recommended that all puppies are vaccinated against this virus.

The course of vaccination consists of:

- an initial course of two injections at a total cost of £45
- an annual booster at £20 each time.

How much will it cost the owner to vaccinate a dog for the first five years of its life?

Answer £ ..... **[1]**

12 The following are a range of recent articles from newspapers and the internet about pet vaccinations.

> Profit-hungry drug companies and vets are 'frightening' dog owners into inoculating their pets more often than necessary, according to Canine Health Concern.

> Some puppies have developed conditions including autism and epilepsy after a great number of injections.

> Dog Dies After Having Rabies Vaccination.

> Early protection with vaccinations can prevent the heartbreak of dealing with parvovirus in a puppy or feline leukaemia in a kitten.

> Before the use of vaccines, certain diseases such as parvovirus and distemper virus were fairly commonly seen, and unfortunately, claimed the lives of many pets.

Describe how vaccinations can be used to prevent diseases of small animals.

Using these articles and your knowledge of how vaccinations work, discuss whether you would vaccinate your pet.

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

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..... **[6]**

13 Zoonoses are diseases that can be transmitted from animals to humans.

(a) Name **one** of these diseases.

..... **[1]**

(b) The owner of a cat thinks it may have fleas, an external parasite.

State the observations that would confirm this diagnosis.

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

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE