

THIS IS A NEW SPECIFICATION

**H****Tuesday 22 January 2013 – 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					
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.

2

Answer **all** the questions.

- 1 The diagrams show how to take a softwood cutting.

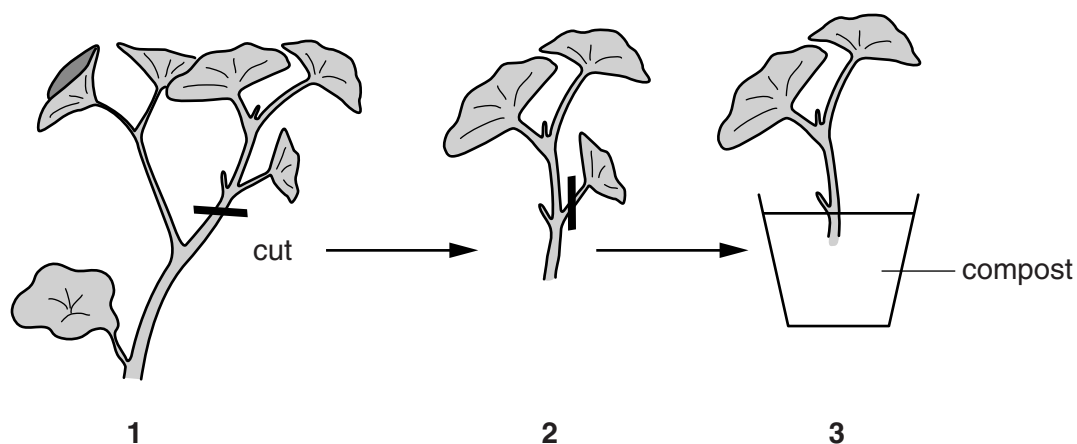


Diagram **2** shows the lower leaf being removed.

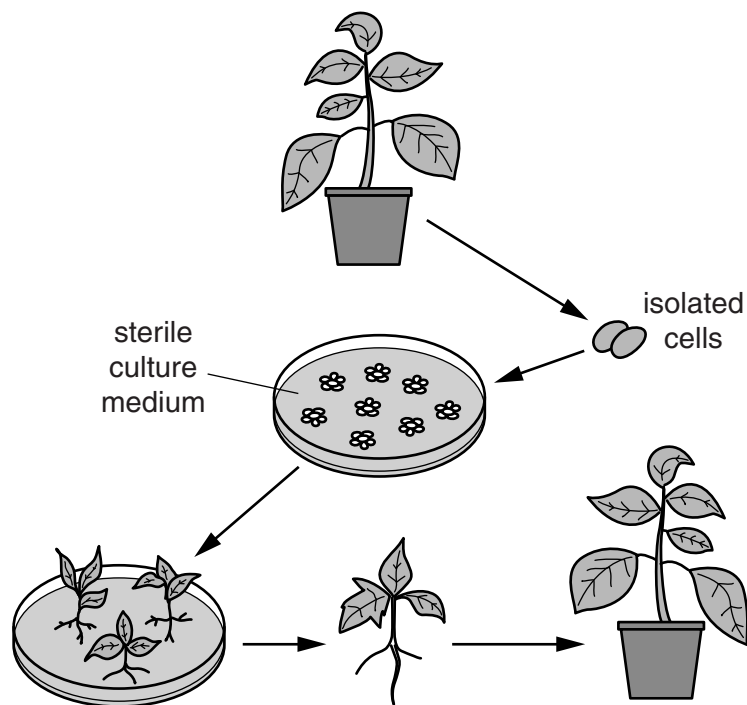
This is done to reduce:

- A** hormone levels
- B** photosynthesis
- C** respiration
- D** water loss.

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

3

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]

4

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]

5

- 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.

.....

 [2]

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

.....

 [2]

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

Explain your answer.

.....

 [2]

 **ZIMAC** 

For use on flowers, fruit and vegetables. Kills ants, aphids, blackfly, whitefly, caterpillars and mites. Kills the insects when they are sprayed directly with Zimac or when they eat plants sprayed with Zimac.

Warnings:

Do not get on skin. Do not breathe in spray. Wash hands after use. Dangerous to fish. Extremely dangerous to bees.



[6]

.....

..... [1]

8

- 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.

.....

.....

..... [3]

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

.....

..... [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]

10

(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.

.....

.....

.....

.....

.....

.....

.....

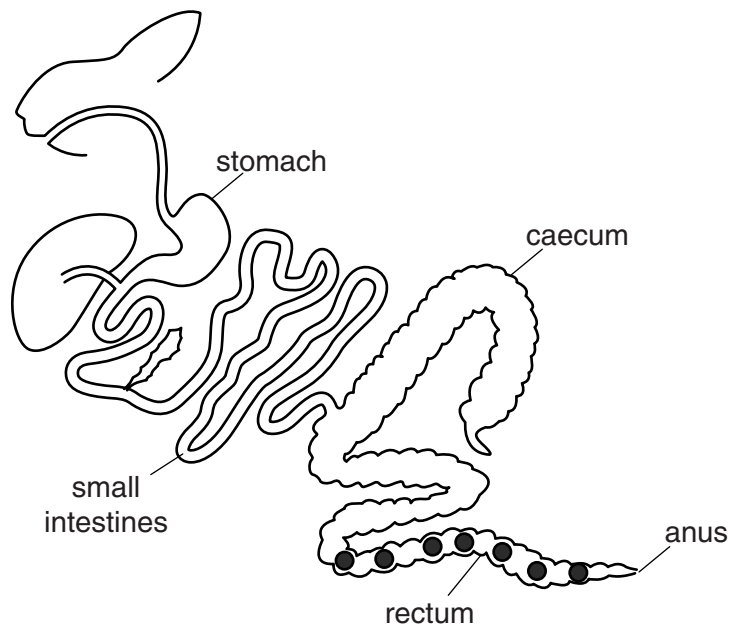
.....

.....

.....

..... [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.

.....

.....

.....

.....

.....

..... [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.

.....

.....

.....

..... [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.

.....

..... [1]

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

.....

.....

..... [2]

13

- 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]



..... [6]

15

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.

.....

.....

..... [2]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.