UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY **0610/12**

Paper 1 Multiple Choice **October/November 2013**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

8348341579

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO NOT WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

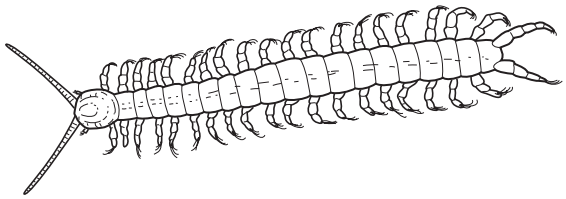
Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.

This document consists of **19** printed pages and **1** blank page.

© UCLES 2013

1 The diagram shows an arthropod.



How many pairs of jointed legs does this arthropod have?

A 2 **B** 20 **C** 21 **D** 40

2 Which group does **not** contain animals that are arthropods?

A annelids

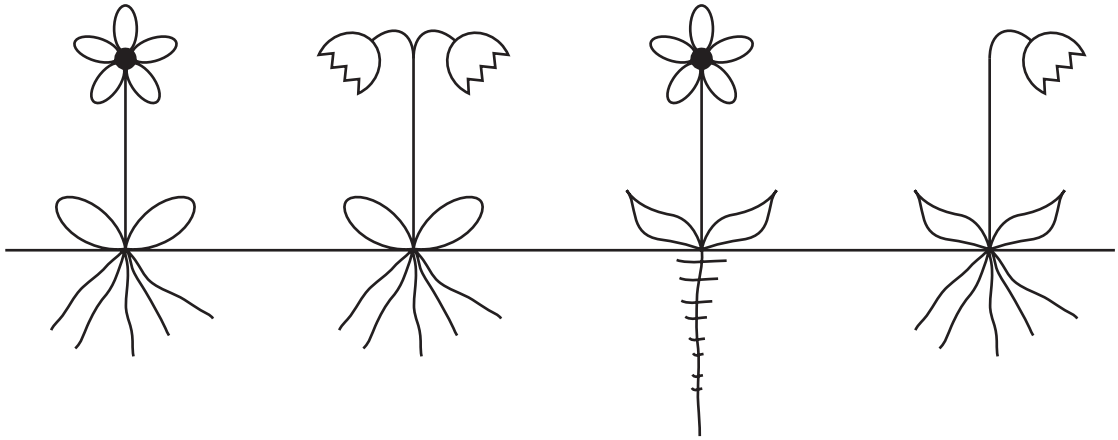
B arachnids

C crustaceans

D insects

3 Keys are used in biological identification.

Which statement may appear in a key and **alone** could identify one of the plants in the diagrams?



A The plant has a single deep root with small branches.

B The plant has many similar roots, arising from a single point.

C The plant has one flower on the stem.

D The plant has pointed leaves.

© UCLES 2013

4 Which process provides the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

5 Which series of terms is listed in order of increasing level of organisation?

A cell → organ → tissue → organ system

B cell → tissue → organ → organ system

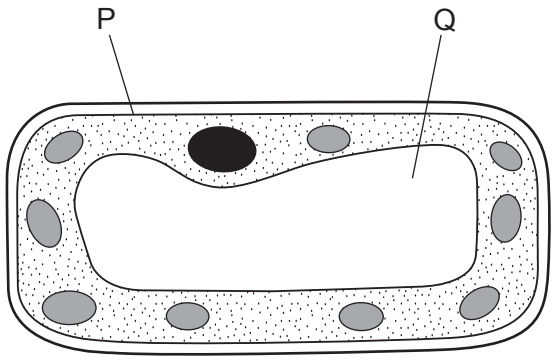
C tissue → cell → organ → organ system

D tissue → organ → organ system → cell

6 Which is a tissue and which is an organ?

	tissue	organ
A	a group of liver cells	xylem
B	a group of palisade cells	the stomach
C	the brain	a root
D	the reproductive system	the liver

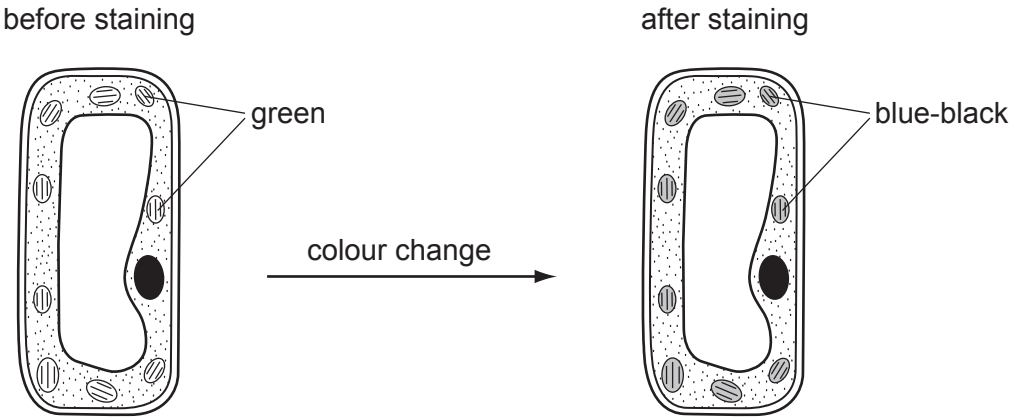
7 The diagram shows a cell seen under the light microscope.



Which labels are correct?

	P	Q
A	cell membrane	cytoplasm
B	cell membrane	vacuole
C	cell wall	cytoplasm
D	cell wall	vacuole

8 The diagrams show a leaf cell before and after staining with iodine solution.



Which substance causes the iodine solution to change colour?

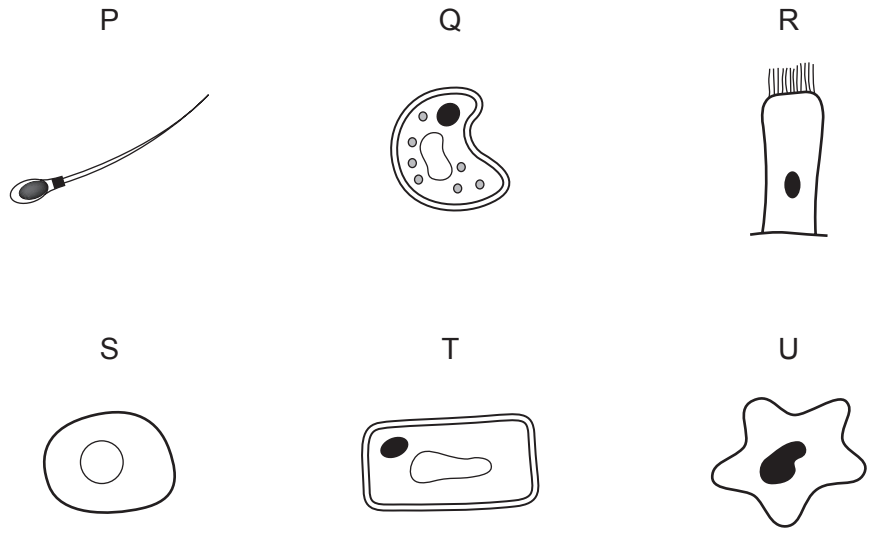
A chlorophyll

B protein

C reducing sugar

D starch

9 The diagram shows six cells.



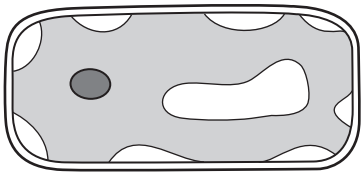
Which are plant cells and which are animal cells?

	plant cells	animal cells
A	P, Q and U	R, S and T
B	P, R, S and T	Q and U
C	Q and T	P, R, S and U
D	R, S and U	P, Q and T

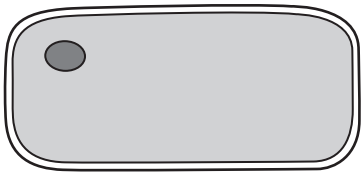
© UCLES 2013

10 Which diagram shows the appearance of a plant cell several minutes after it has been placed in a concentrated solution of sugar?

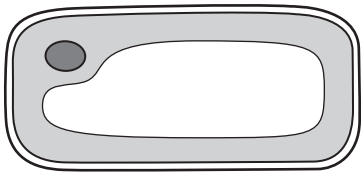
A



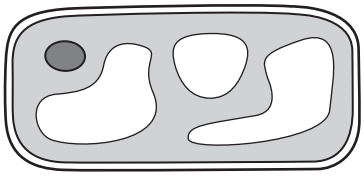
B



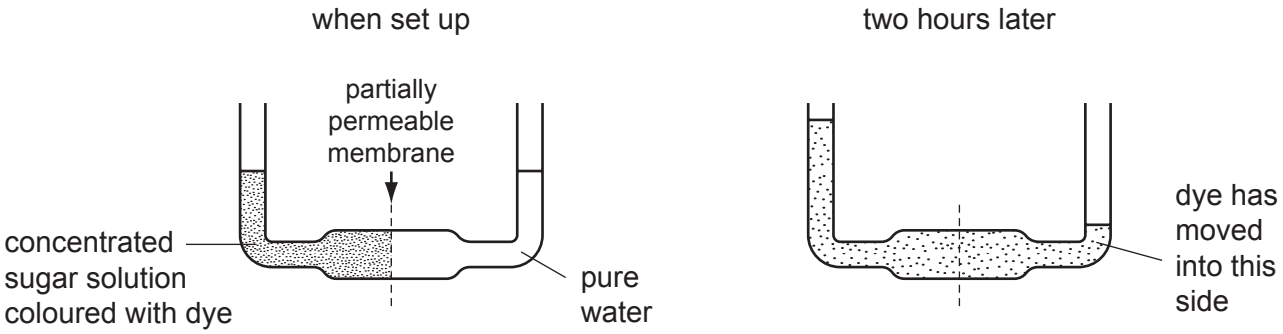
C



D



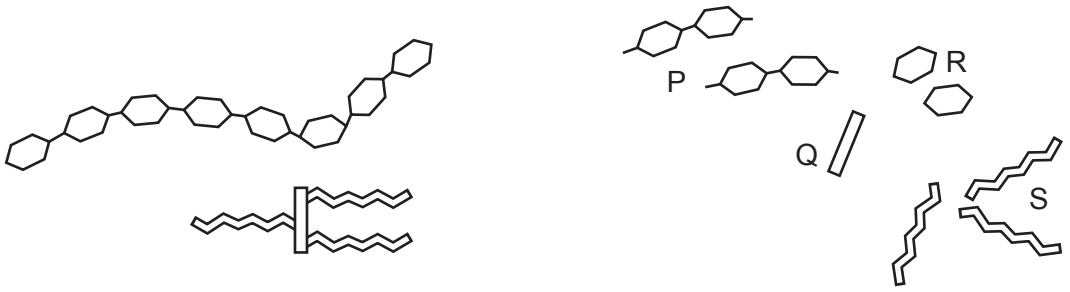
11 The diagrams show an experiment when set up and the same experiment two hours later.



What explains the movement of water and dye?

	movement of water	movement of dye
A	diffusion	osmosis
B	osmosis	diffusion
C	osmosis	translocation
D	translocation	diffusion

12 The diagram shows two food molecules before and after they have been digested by enzymes.



before after

What identifies the products of fat digestion?

A P and R **B** P and S **C** Q and R **D** Q and S

13 Which statement is correct for **all** catalysts?

A They are enzymes.

B They are proteins.

C They speed up chemical reactions.

D They work in living organisms.

14 Two enzyme-controlled reactions are shown.

$$\text{amino acids} \xrightarrow{\text{enzyme 1}} \text{proteins}$$

$$\text{proteins} \xrightarrow{\text{enzyme 2}} \text{amino acids}$$

From these reactions, what deduction can be made about enzymes?

A Enzyme 1 has been changed to enzyme 2.

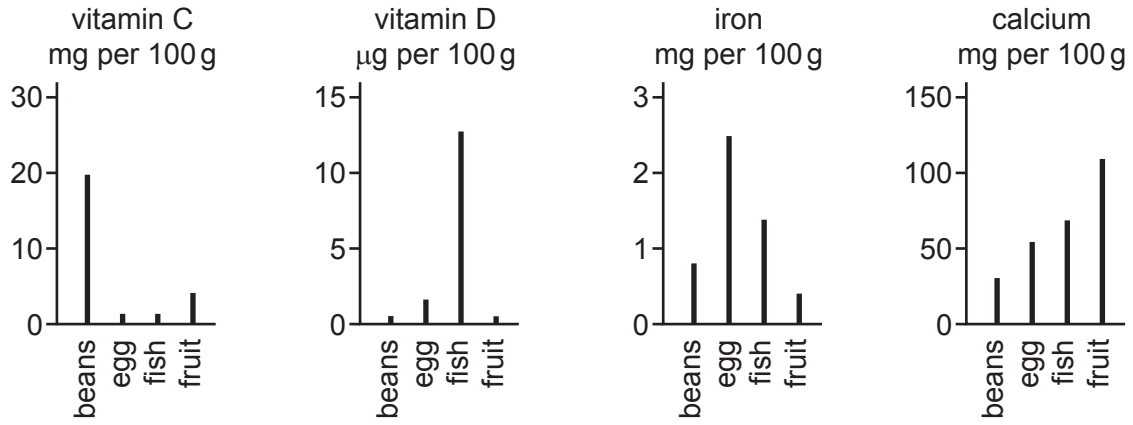
B Enzyme 2 slows down the production of amino acids.

C Enzymes can build up large molecules.

D Enzymes only break down large molecules.

© UCLES 2013

15 The graphs show the quantities of selected vitamins and mineral ions in four foods.



Which food is the richest source of the vitamin or mineral ions essential for the transport of oxygen by the blood?

A beans

B egg

C fish

D fruit

16 Four foods were tested for each of the following nutrients:

fat (using ethanol);

protein (using the biuret test);

reducing sugar (using Benedict's solution),

Which food contains protein and fat?

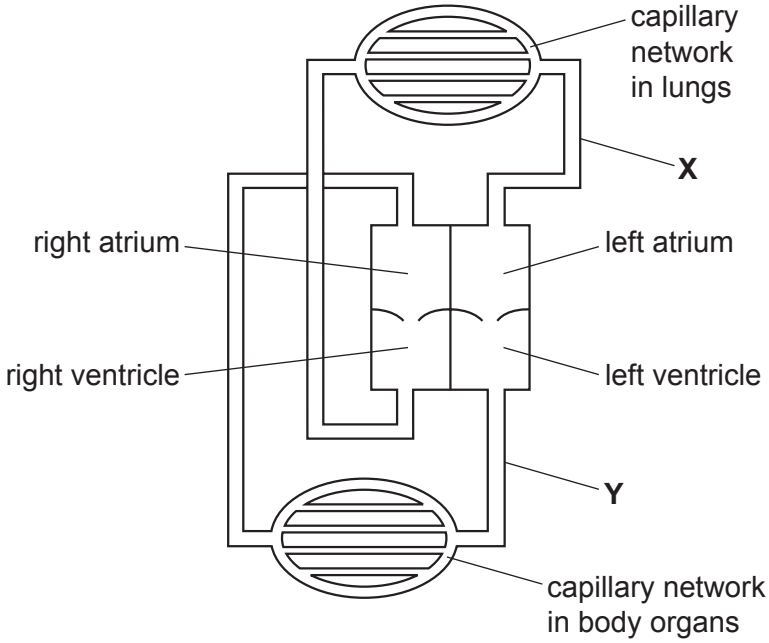
	colour of result of food test		
	purple / lilac	brick-red / orange	milky-white
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key

✓ = nutrient present

✗ = nutrient absent

17 The diagram shows the circulatory system of a mammal.

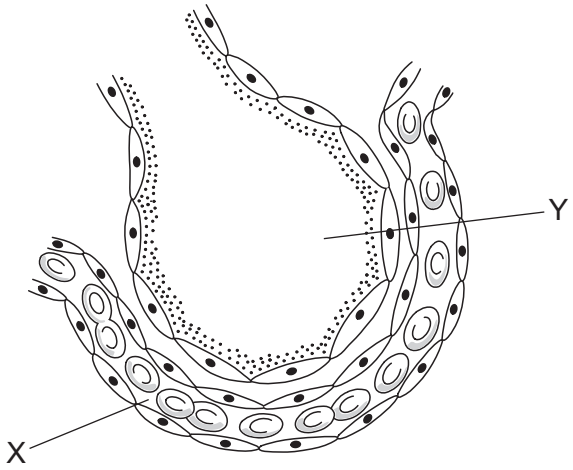


What describes the blood in vessels **X** and **Y**?

	X	**Y**
A	deoxygenated	deoxygenated
B	deoxygenated	oxygenated
C	oxygenated	deoxygenated
D	oxygenated	oxygenated

© UCLES 2013

18 The diagram shows a section through an alveolus and a capillary.



Why does carbon dioxide move from X to Y?

A Air has a lower concentration of carbon dioxide than blood.

B Carbon dioxide moves more freely in air than in blood.

C Carbon dioxide must replace oxygen.

D Diffusion of carbon dioxide can only be out of the blood.

19 The table shows the approximate composition of air breathed out by a mammal.

gas	air breathed out / %
nitrogen	80
oxygen	16
carbon dioxide	4

Where did the nitrogen in the air breathed out come from?

A It was a product of proteins broken down in the mammal.

B It was a product of respiration.

C It was in the air that was breathed in.

D It was exchanged for oxygen which was taken into the blood.

20 In which order does water pass through these tissues in a plant?

A mesophyll → xylem → root cortex

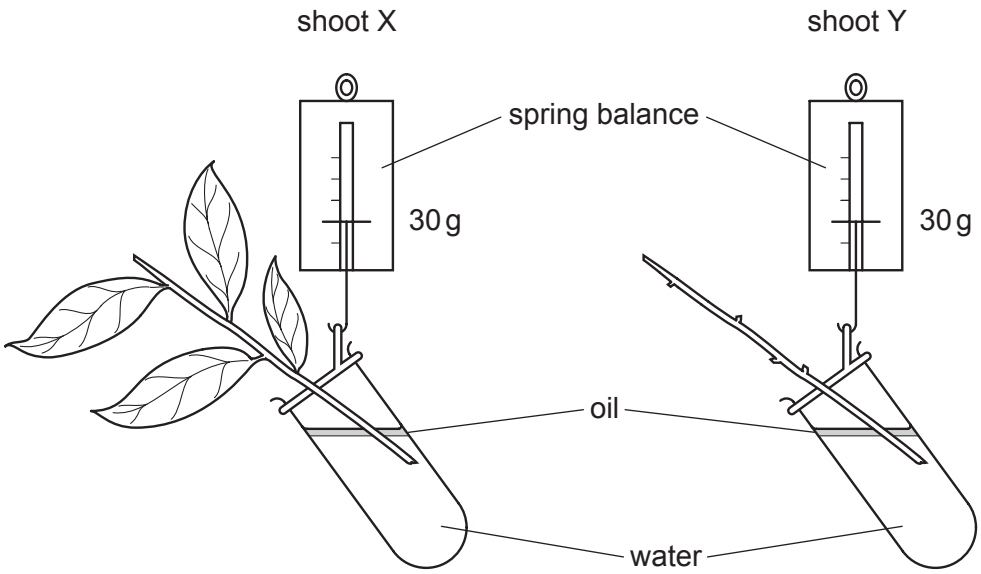
B root cortex → mesophyll → xylem

C root cortex → xylem → mesophyll

D xylem → mesophyll → root cortex

© UCLES 2013

21 The diagram shows two shoots at the start of an experiment on transpiration.

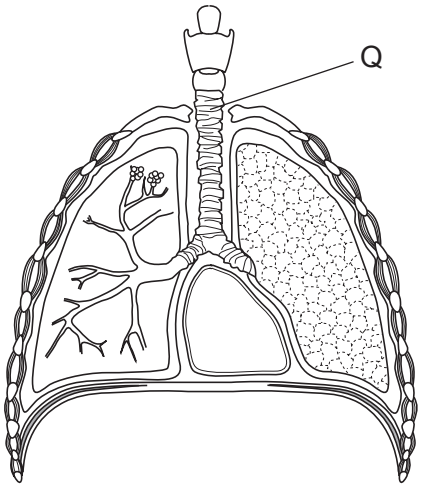


What are the likely readings on the spring balances after three days?

	shoot X	shoot Y
A	30 g	30 g
B	30 g	25 g
C	25 g	30 g
D	25 g	25 g

© UCLES 2013

22 The diagram shows some structures in the human neck and thorax.



The lining of tube Q has cilia.

What is an important function of the cilia?

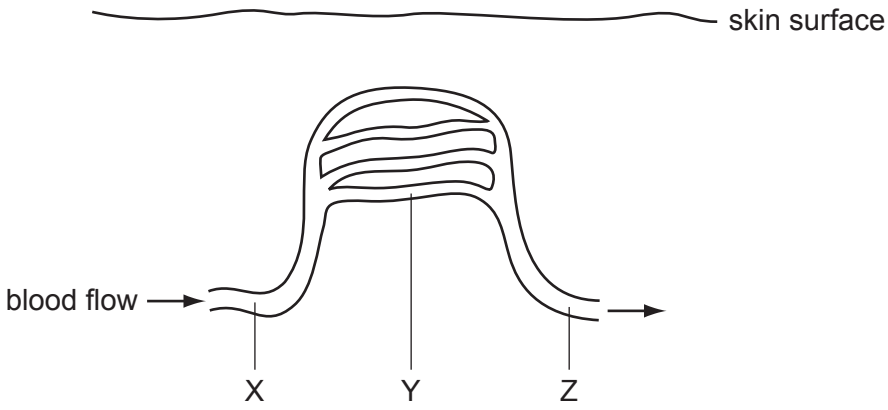
A to help in the exchange of gases

B to increase the internal surface area of tube Q

C to moisten the air entering and leaving the lungs

D to move mucus towards the throat

23 The diagram shows some blood vessels near the surface of the skin.



If vasoconstriction occurs at X, what happens to the blood flow at Y and Z?

	Y	Z
A	decreases	decreases
B	decreases	stays constant
C	increases	increases
D	increases	stays constant

24 How does sweating cool the body?

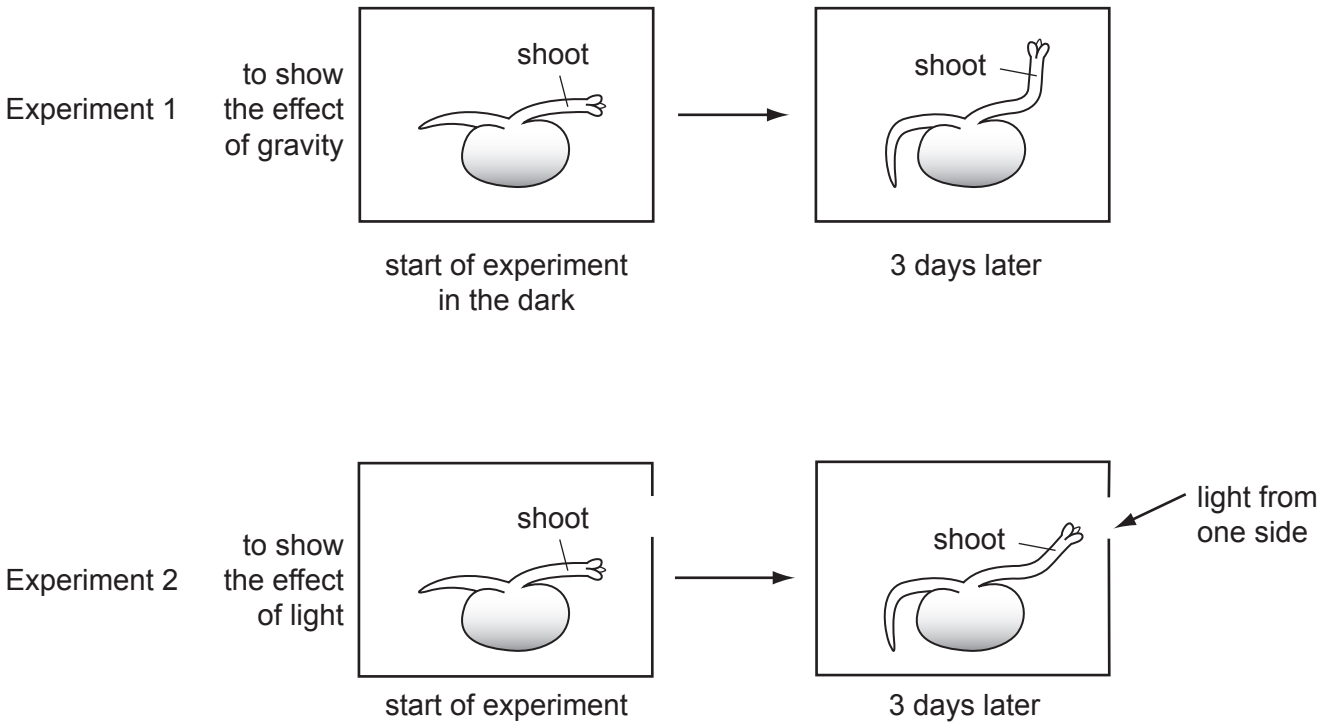
A Sweating causes vasodilation.

B Sweating decreases the water content of the blood.

C Urea and salt are lost from the body in sweat.

D Water in sweat evaporates from the skin.

25 The diagram shows seedlings in two experiments on the tropic response of seedlings to gravity and light.



How have the seedlings responded?

	to gravity	to light
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = tropic response shown

✗ = no tropic response shown

© UCLES 2013

26 A person has a high-protein diet.

What describes the level of urea in the blood leaving the liver and in the urine leaving the kidneys?

	urea in blood leaving liver	urea in urine leaving kidneys
A	high	high
B	high	low
C	low	high
D	low	low

27 A mango tree can reproduce by seed and by asexual reproduction.

Trees produced by each of these methods produce mango fruits.

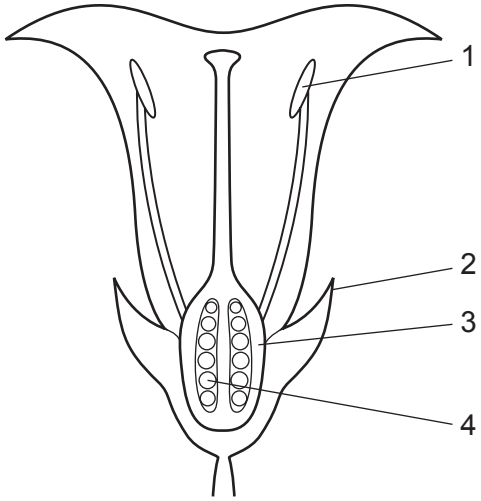
When comparing these fruits genetically, what is the correct result?

	fruits of trees grown from seeds	fruits of trees produced by asexual reproduction
A	identical	identical
B	identical	non-identical
C	non-identical	identical
D	non-identical	non-identical

© UCLES 2013

[Turn over

28 The diagram shows a section through a flower.



After the flower is fertilised, which parts will develop into the fruit and the seed?

	fruit	seed
A	1	2
B	1	4
C	2	3
D	3	4

29 Which environmental factor is **not** always a requirement for seed germination?

A light

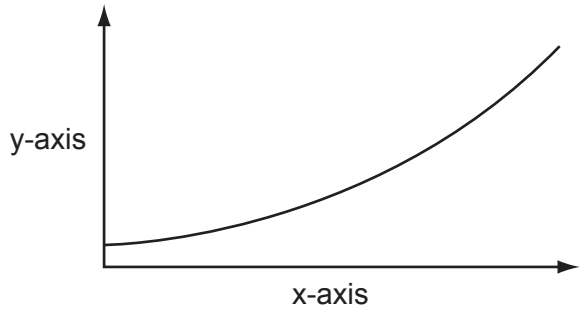
B oxygen

C suitable temperature

D water

© UCLES 2013

30 The graph is a record of the growth of a plant.



Which labels should be used for the x-axis and the y-axis?

	x-axis	y-axis
A	dry mass	number of cells
B	time	cell size
C	time	dry mass
D	total mass	time

31 Most birds have a coloured pigment in their feathers, but in a few individuals, pigment is absent and the birds are albinos.

Albinism occurs when a bird is homozygous recessive for the gene which creates the coloured pigment.

If two albino birds mated, what describes the appearance of their offspring?

A all albino

B all coloured

C 50% coloured, 50% albino

D 75% coloured, 25% albino

32 In an animal, the allele for straight fur is dominant to the allele for curly fur.

A pair of these animals mate and have nine offspring with straight fur and three with curly fur.

F represents the allele for straight fur and f represents the allele for curly fur.

What are the most likely genotypes of the parents?

A F and f **B** FF and ff **C** FF and Ff **D** Ff and Ff

© UCLES 2013

33 What defines a diploid nucleus?

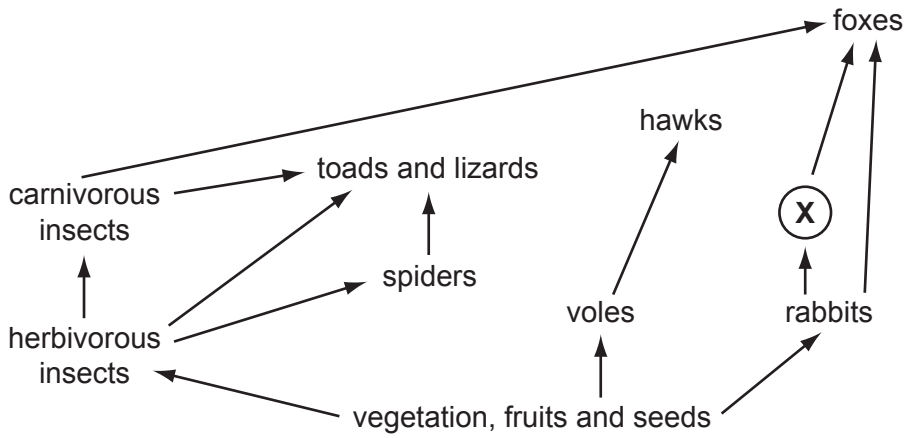
A a nucleus containing two sets of chromosomes

B a nucleus containing two unpaired chromosomes

C a nucleus with two alternative forms of a gene

D a nucleus with two separate threads of DNA

34 The diagram shows a food web.



What type of organism is **X**?

A a carnivore

B a decomposer

C a herbivore

D a producer

35 A food chain shows how organisms depend on each other for their sources of energy, but all energy comes ultimately from one source.

What is this energy source?

A leaves of plants

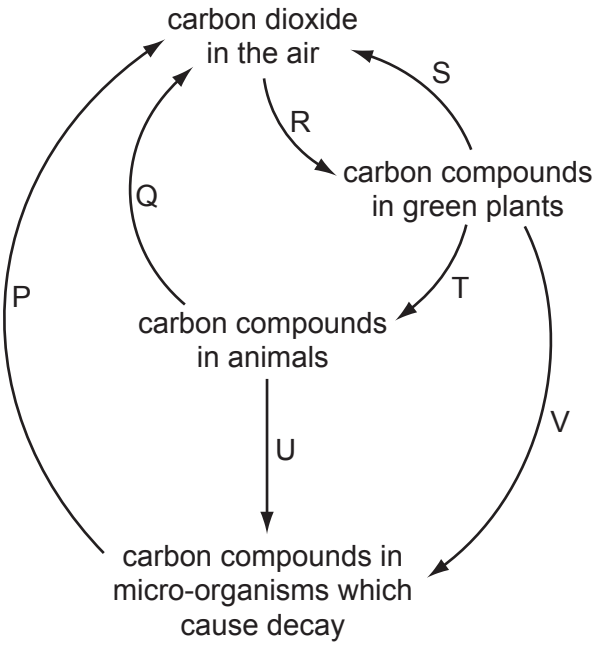
B meat

C sunlight

D water

© UCLES 2013

36 The diagram shows the carbon cycle.



Which three letters represent respiration?

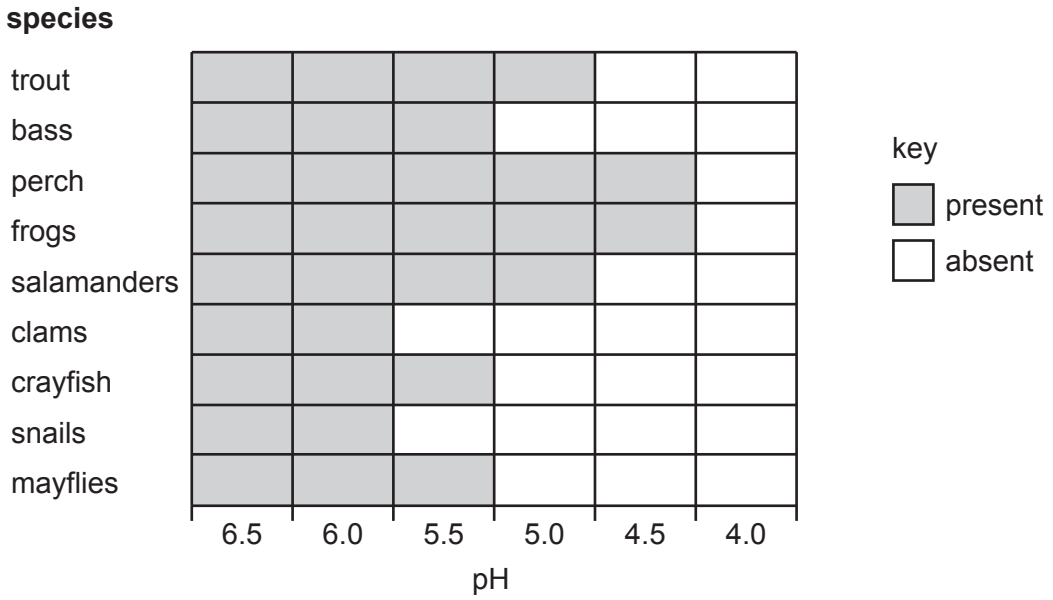
A P, Q and R **B** P, Q and S **C** T, S and V **D** T, U and V

37 In which natural cycles do photosynthesis and respiration **both** play a part?

	carbon cycle	water cycle
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

© UCLES 2013

38 The chart shows which species of different animals are present in rivers of different pH.



Which conclusion can be drawn from this information?

A Both frogs and mayflies can live in more acidic river water than trout.

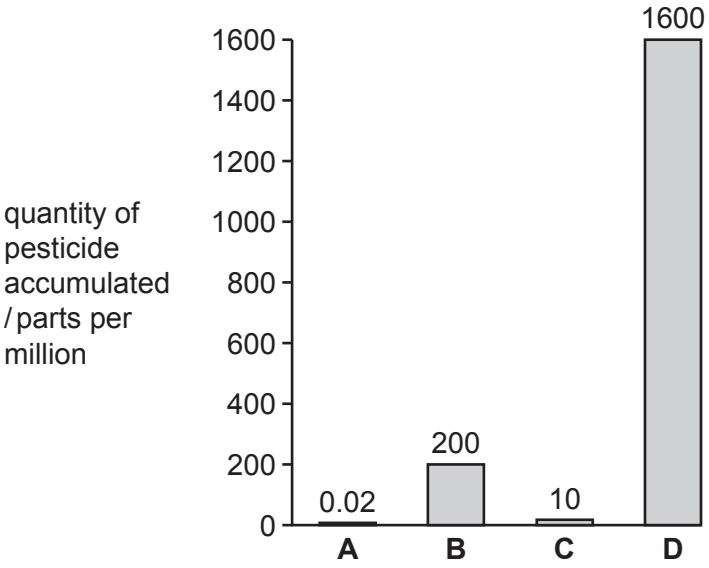
B Clams and snails are most affected by acidic river water.

C Most species can live in river water below pH 5.5.

D Not all species are affected by acidic river water.

39 The graph shows the quantities of pesticides that accumulate in four populations, each at different trophic levels in a food chain.

Which population is most likely to be herbivores?



40 What is the correct sequence for the stages in a sigmoid population growth curve?

A lag → log → stationary

B log → lag → stationary

C stationary → lag → log

D stationary→ log → lag

© UCLES 2013

BLANK PAGE

Copyright Acknowledgements:

Question.39 © adapted: Jean Martin; *Core Biology*; Cambridge University Press; 1999.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

Cambridge International Examinations 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.