UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

BIOLOGY **5090/01**

Paper 1 Multiple Choice **October/November 2008**

1 hour

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

8431966114

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.

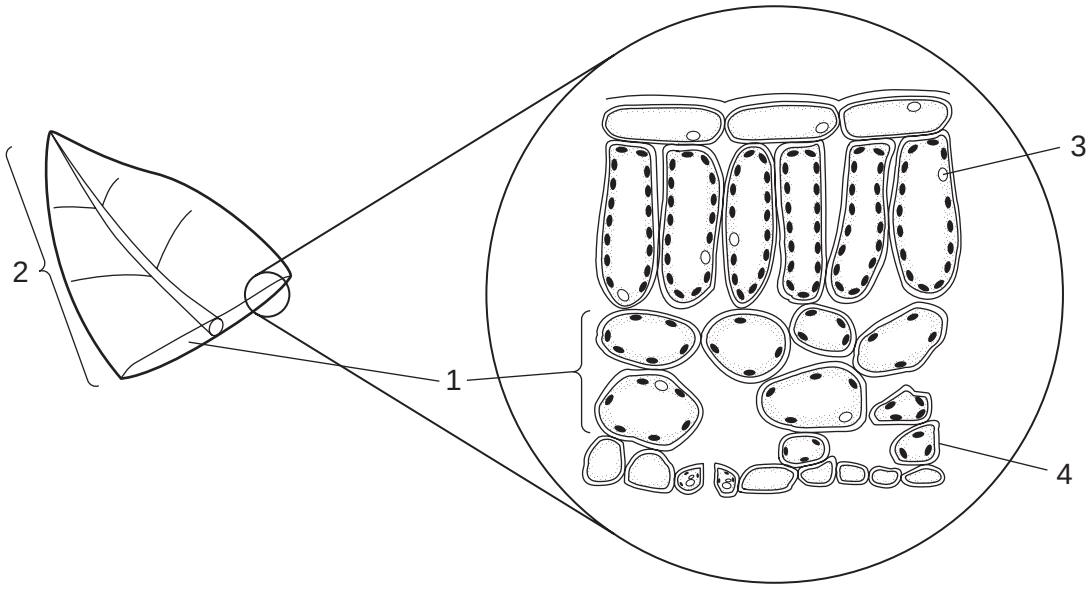
There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

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.

This document consists of **18** printed pages and **2** blank pages.

1 The diagram shows the structure of a leaf.



Which letter identifies a cell, a tissue and an organ?

	cell	tissue	organ
A	3	2	4
B	1	4	3
C	4	1	2
D	2	3	1

2 Diagram 1 shows an onion cell that has been placed in pure water.

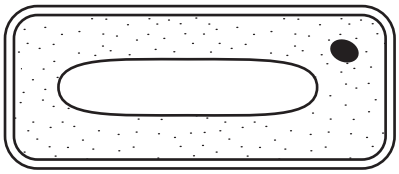


diagram 1

The cell is now placed in a concentrated sugar solution.

It changes to appear as in diagram 2.

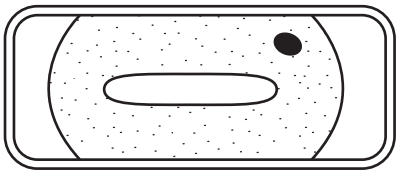


diagram 2

Which statement explains the change?

A Sugar has moved into the cell.

B Sugar has moved out of the cell.

C Water has moved into the cell.

D Water has moved out of the cell.

3 Four tubes containing 10 cm^3 of 1 % starch solution were treated in different ways and then mixed with saliva. After 30 minutes, 1 cm^3 of iodine in potassium iodide solution was added to each tube.

In which tubes were the contents a yellow-brown colour?

	tube incubated at 35 °C	tube incubated at 75 °C	tube incubated at pH 2.5	tube incubated at pH 6.9
A	✓		✓	
B	✓			✓
C		✓		✓
D		✓	✓	

key

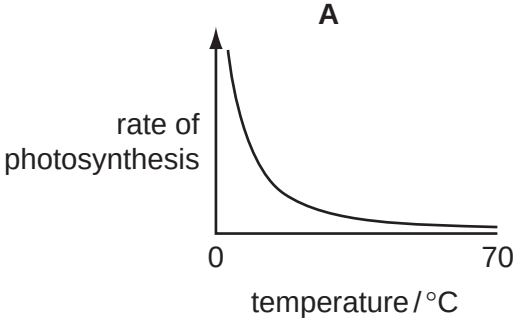
✓ = yellow-brown colour

4 According to the lock and key hypothesis, which is the lock and which is the key for the enzyme lipase?

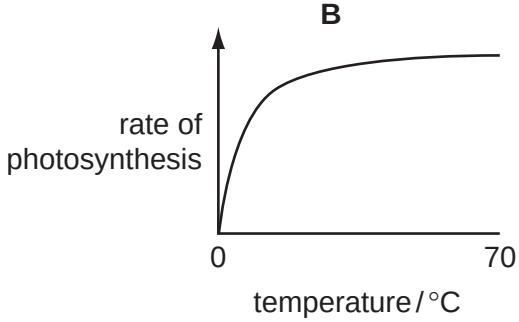
	key	lock
A	fatty acids	lipids
B	lipase	lipids
C	lipase	fatty acids
D	lipids	lipase

5 Which graph shows the effect of temperature on the rate of photosynthesis?

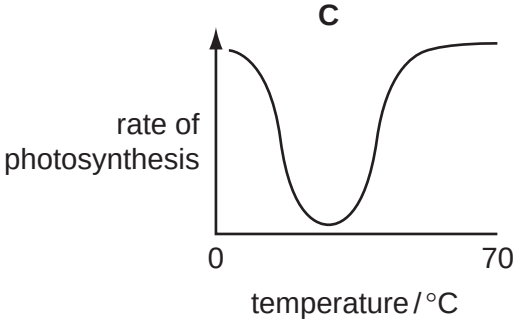
A



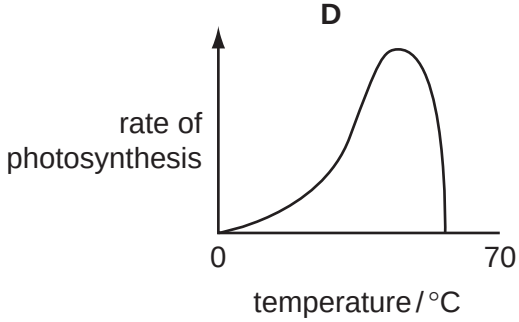
B



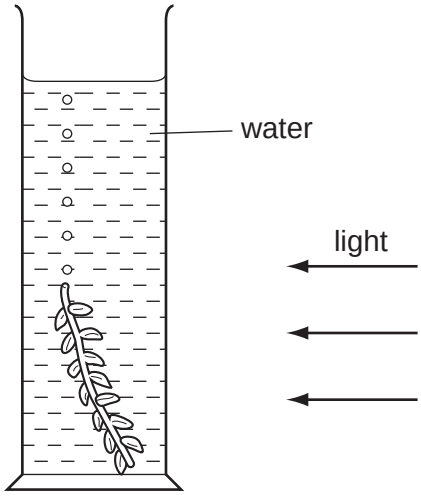
C



D



6 The waterweed shown in the apparatus is illuminated and is photosynthesising. The rate is measured by bubbles of gas released.



After a few minutes the bubbles cease.

Which factor in the water might be limiting the rate of photosynthesis?

A carbon dioxide

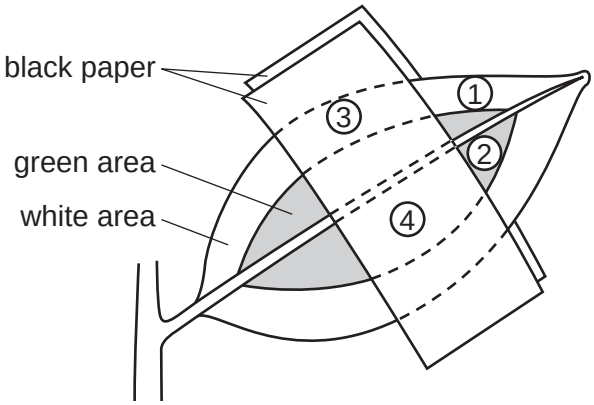
B magnesium

C nitrate

D oxygen

7 A plant has leaves that are partly green and partly white. The plant is destarched and a leaf is partly covered by black paper.

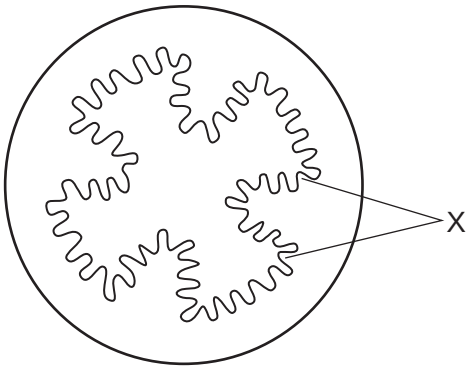
The plant is placed in bright light for several hours. Four discs are then cut from the leaf in the positions shown and are tested for starch.



Which discs contain starch?

A 1 only **B** 1 and 2 **C** 2 only **D** 3 and 4

8 The diagram represents a section through the small intestine.



What is the role of the structures labelled X?

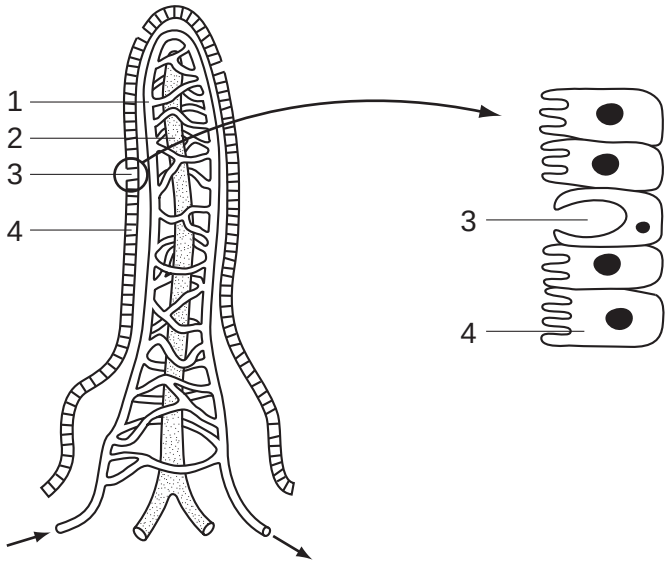
A They help to move the food along.

B They make a large surface area for absorption.

C They protect against bacteria.

D They move mucus over the surface.

9 The diagram represents a villus.



Which sequence correctly describes the functions of the numbered parts?

	1	2	3	4
A	absorbs digested fats	absorbs glucose	produces enzymes	produces mucus
B	absorbs digested fats	absorbs glucose	produces mucus	produces enzymes
C	absorbs glucose	absorbs digested fats	produces enzymes	produces mucus
D	absorbs glucose	absorbs digested fats	produces mucus	produces enzymes

10 It has been shown that animals restricted to a diet of milk only, eventually suffer from blood disorders involving a lack of pigment in their red blood cells.

Which is the most likely explanation of this?

A Milk is deficient in iron.

B Milk contains more calcium than is required by most animals.

C Milk is deficient in vitamin A.

D Milk contains no roughage.

11 Crop plants are grown in well-watered soils.

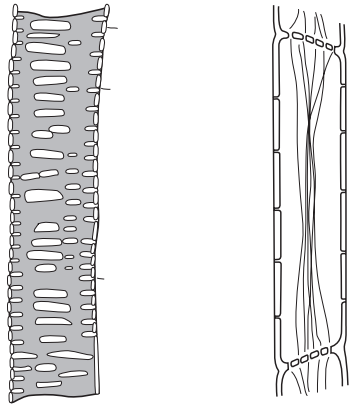
Their root hair cells have higher concentrations of mineral ions than in the soil surrounding them.

What processes are used by these plants to absorb water and mineral ions?

	water	mineral ions
A	active uptake	osmosis
B	diffusion	osmosis
C	osmosis	diffusion
D	osmosis	active uptake

[Turn over

12 The diagram shows two plant cells, X and Y, drawn to different scales.



X Y

Samples of the contents of X and Y were tested.

What results are expected?

	X		Y	
	Benedict's reagent	iodine	Benedict's reagent	iodine
A	+	+	+	+
B	+	–	+	–
C	–	+	–	+
D	–	–	–	–

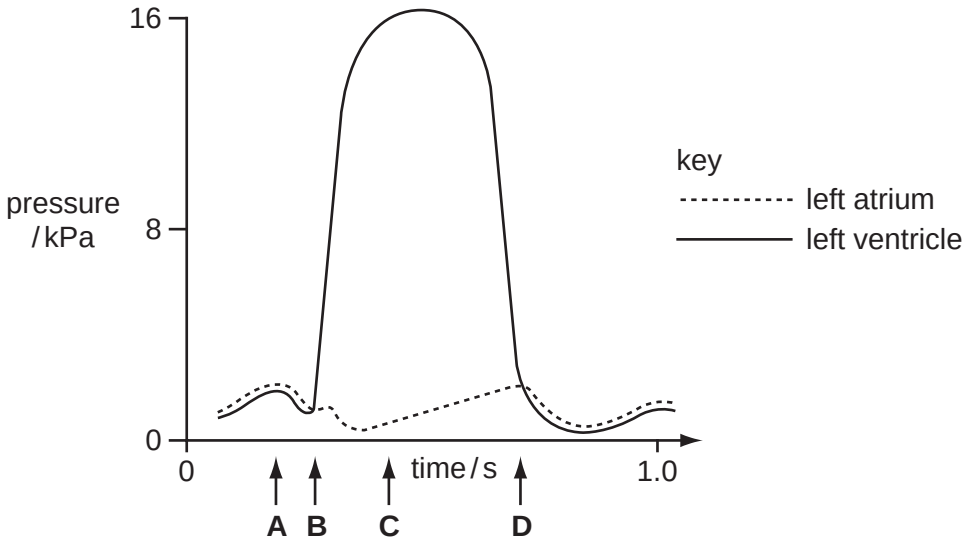
key

– = negative result

+ = positive result

13 The graph shows the pressure changes in the left atrium and the left ventricle while the heart is beating.

At which point do the atrio-ventricular (bicuspid and tricuspid) valves close?



14 The table shows substances that pass between capillaries and tissues in a part of the body.

substance	into the capillaries from the tissues	out of the capillaries into the tissues
oxygen		✓
carbon dioxide	✓	
amino acids		✓
urea	✓	

key

✓ = does pass

In which part of the body are these capillaries?

A between the alveoli

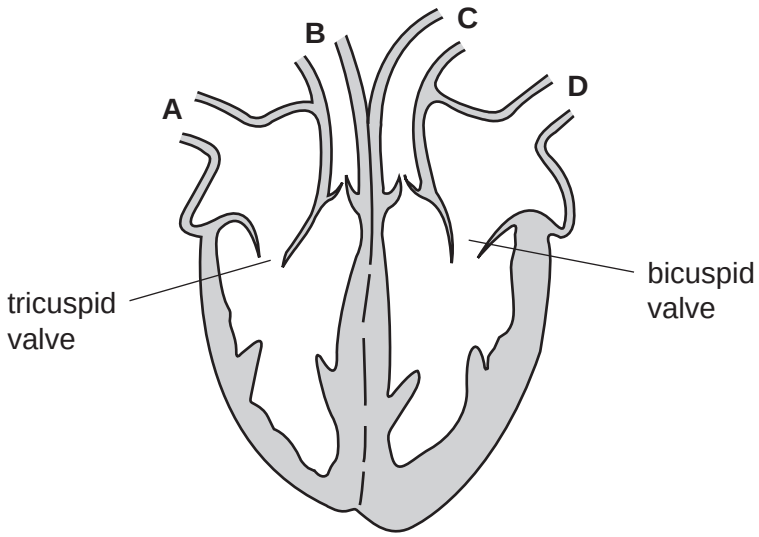
B in the kidney

C in the liver

D in the villi

15 Look at the diagram of a heart.

Which vessel is a vein carrying oxygenated blood?



16 Which equation represents anaerobic respiration in yeast?

A glucose → alcohol + carbon dioxide

B glucose → alcohol + water

C glucose → lactic acid + carbon dioxide

D glucose → lactic acid + water

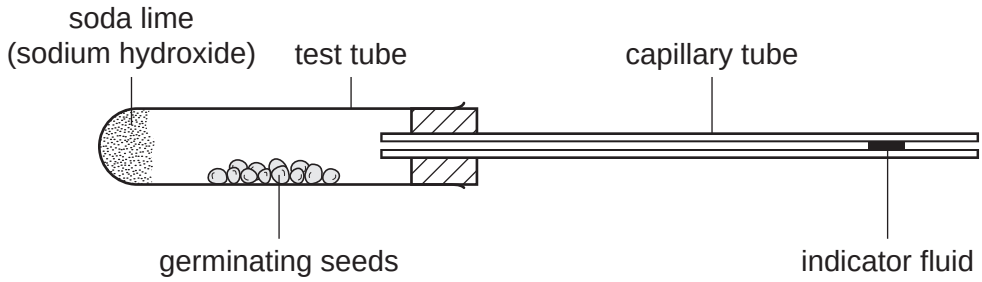
17 The table shows the composition of inspired and expired air.

	inspired air %	expired air %
oxygen	20	16
carbon dioxide	0.04	X
nitrogen and inert gases	79.96	Y

What are the likely percentages at X and Y?

	X	Y
A	0.04	83.96
B	4	80
C	20	64
D	83.96	0.04

18 The diagram shows an investigation into the respiration of germinating seeds.



The indicator fluid in the capillary tube shown in the diagram above will

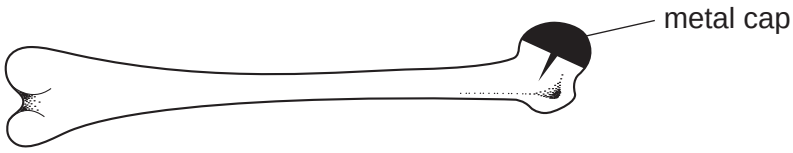
A move away from the test-tube because of oxygen output by the seeds.

B move towards the test-tube because of carbon dioxide intake by the seeds.

C move towards the test-tube because of oxygen intake by the seeds.

D remain stationary, because carbon dioxide output and oxygen intake are equal.

19 The diagram shows a bone from the forelimb. One end of the bone has been replaced with a metal cap.



Which bone is this, and which joint does the metal cap repair?

	bone	joint
A	humerus	elbow
B	humerus	shoulder
C	ulna	elbow
D	ulna	shoulder

20 Urea is produced in one organ, filtered from the blood by a second organ and stored inside a third organ before being expelled from the body.

Which organs carry out these functions?

	production	filtration	storage
A	kidney	bladder	liver
B	kidney	liver	bladder
C	liver	bladder	kidney
D	liver	kidney	bladder

21 What is meant by negative feedback?

A A change away from a set point causes a change back towards the set point.

B A change away from a set point causes further change away from the set point.

C A change towards a set point causes a change away from a set point.

D Changes away from a set point are prevented.

22 What is a sign of diabetes mellitus?

A glucose in the blood

B glucose in the urine

C insulin in the blood

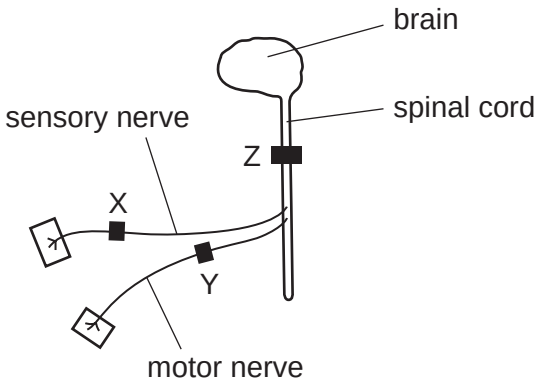
D insulin in the urine

[Turn over

23 Which changes occur in the body when a person is shocked?

	increase in	decrease in
A	the diameter of the pupils in the eye	the speed of peristalsis
B	the rate of conversion of glycogen to glucose	the diameter of the pupils in the eye
C	the rate of urine formation	the rate of conversion of glycogen to glucose
D	the speed of peristalsis	the rate of urine formation

24 The diagram represents a central nervous system. X,Y, and Z show possible sites where the system can be blocked by a local anaesthetic.



Of four men, one had no anaesthetic block and the other three had only one anaesthetic block at X, Y or Z.

One of the men can feel a pinprick on his leg but cannot move it.

Where is the anaesthetic block?

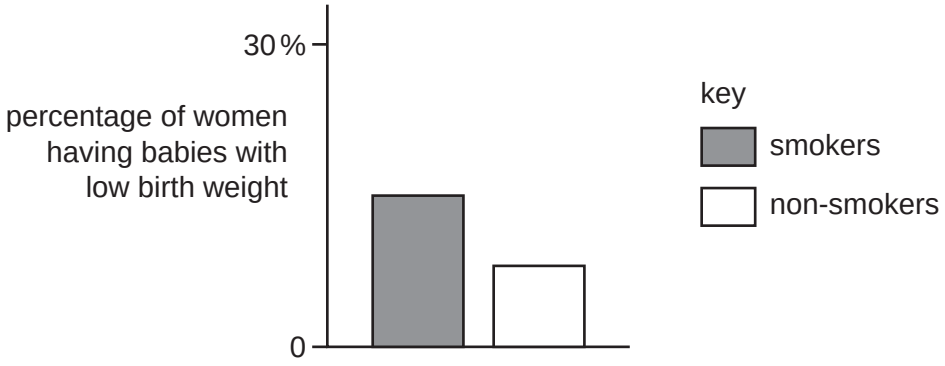
A block is at X

B block is at Y

C block is at Z

D no block

25 The bar chart shows the percentage of women who gave birth to babies of low weight, amongst smokers and non-smokers.



What is shown by the bar chart?

A More women smoke during pregnancy than do not.

B Smoking during pregnancy has no effect on birth weight.

C Smoking in pregnancy increases the risk of low birth weight.

D Women whose babies have low birth weight must have smoked in pregnancy.

26 The table shows the characteristics of four microbes.

Which one could be a virus?

	contains DNA	contains one or more cells	contains one or more cell nuclei	produces spores
A	✓	✗	✗	✗
B	✓	✓	✗	✗
C	✓	✓	✓	✗
D	✓	✓	✓	✓

key
✓ = true
✗ = false

27 Which group of waste materials are likely to be decomposed most quickly by the action of micro-organisms?

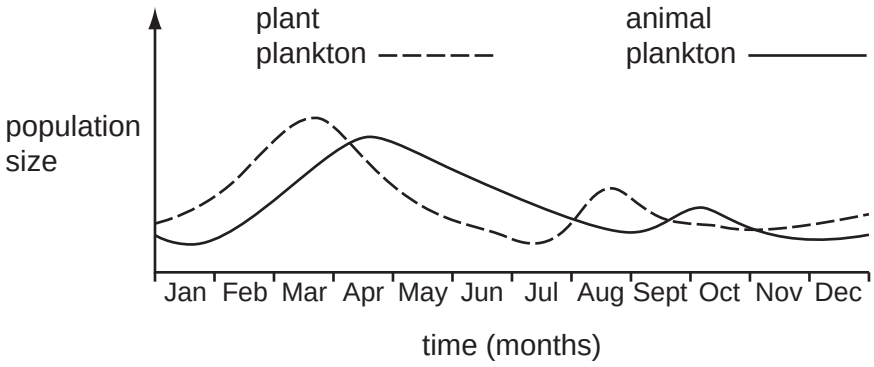
A glass and building bricks

B shredded paper

C mouldy food

D toxic chemicals

28 The graph shows changes in population over time for plant and animal plankton in a lake.



Consider the following statement in relation to the data provided by the graph.

'Population changes in animal plankton lag behind similar changes in plant plankton because the animals feed on the plants.'

Into which category does the statement fall?

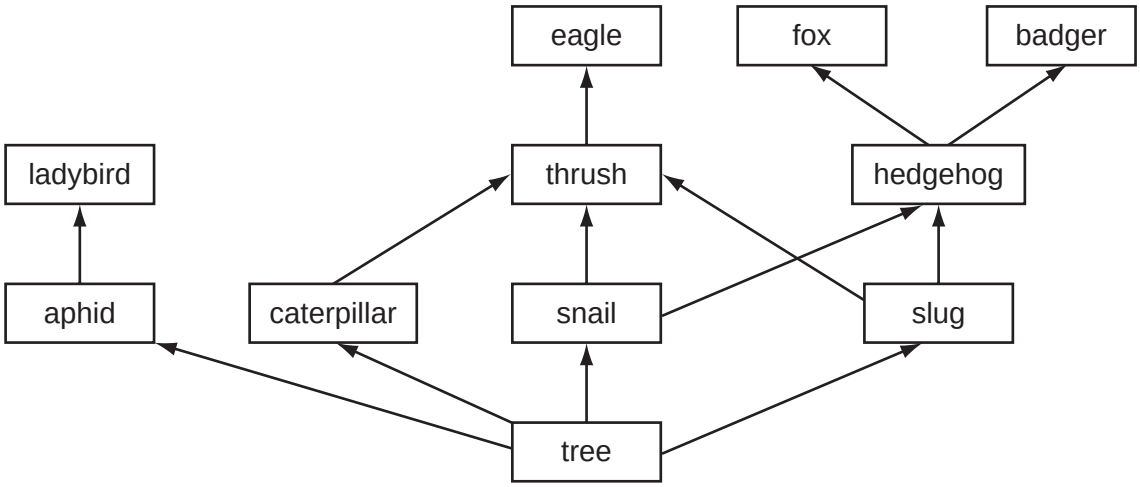
A It is a reasonable interpretation of the data.

B It is a restatement of the data, not an interpretation.

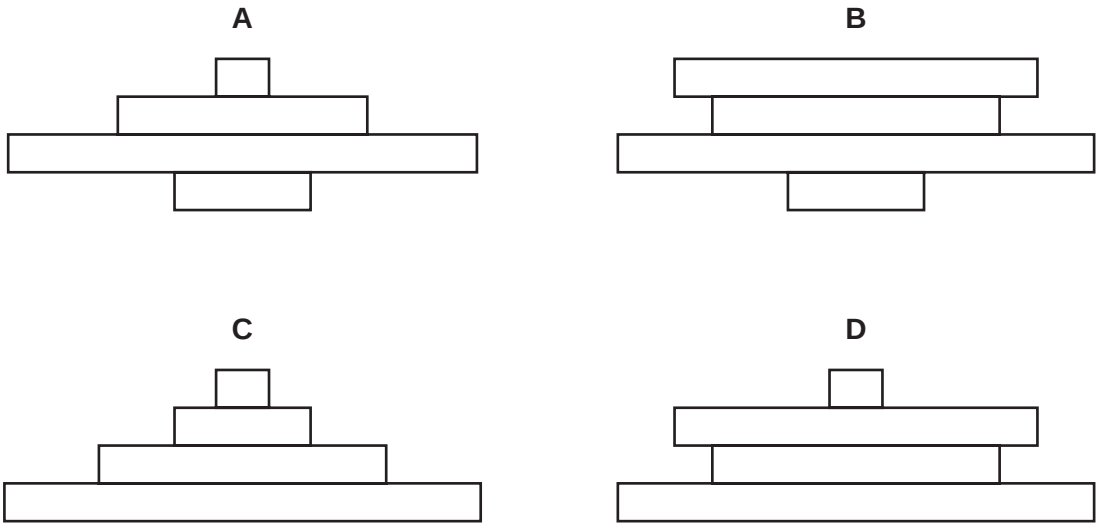
C It is contradicted or not supported by the data.

D More data are required in order for this interpretation to be made.

29 The diagram shows part of a food web.



Which is a pyramid of numbers based on this food web?



30 Which group of bacteria convert ammonia into nitrates in the nitrogen cycle?

A anaerobic bacteria

B denitrifying bacteria

C nitrifying bacteria

D nitrogen fixing bacteria

31 Which method of malarial control is effective against both adult and larval forms of the mosquito?

A covering standing water

B draining swamps

C spraying insecticides

D spraying oil on standing water

[Turn over

32 In recent years, important rivers in many parts of the world have become more acidic.

What has caused this change?

A air pollution by sulphur dioxide

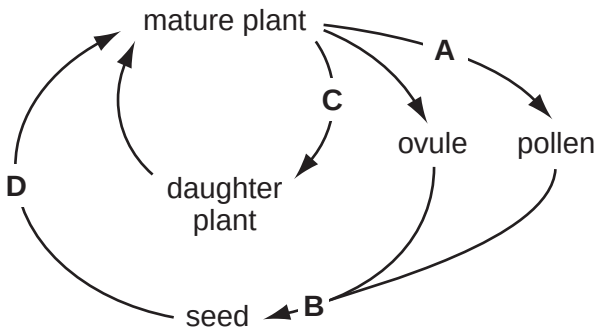
B deforestation

C increased use of insecticides

D increased use of nitrate fertilisers

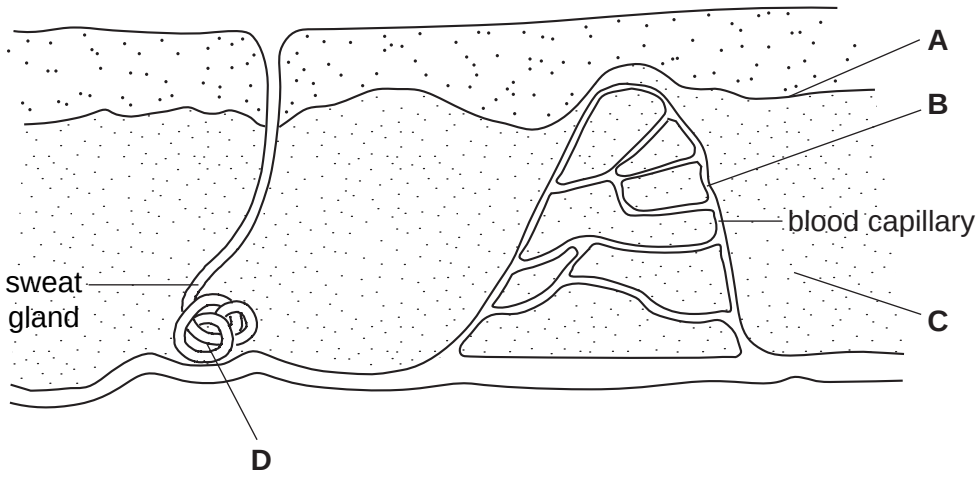
33 The diagram shows the life cycle of a species of plant.

During which stage does reduction division occur?



34 The diagram represents a section through the human skin.

In which part is mitosis occurring most rapidly?



35 What is an advantage of feeding a baby with bottled milk rather than breast milk?

A Breast milk contains antibodies.

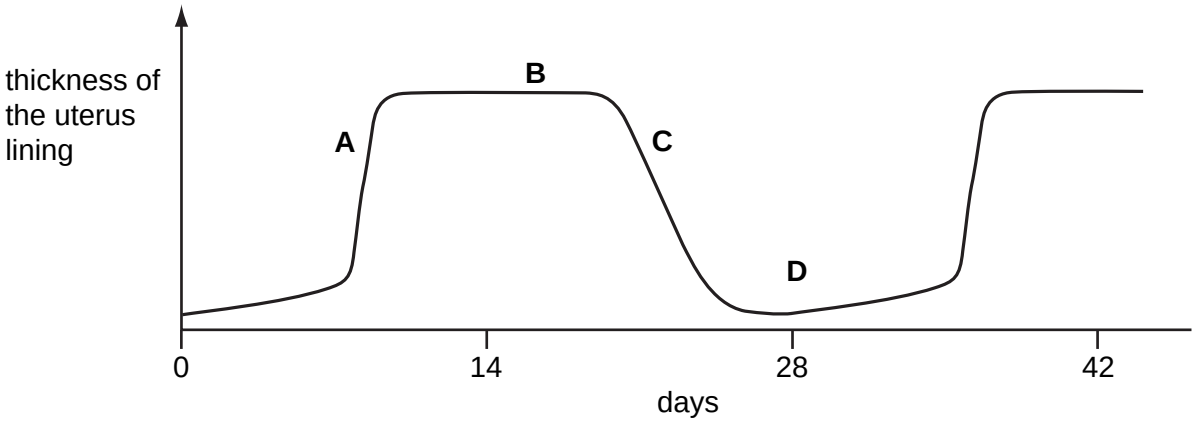
B It is easier to keep the milk free of pathogens.

C The baby's intake of food can be measured.

D The milk is always at the right temperature.

36 The diagram shows the changes in the thickness of the uterus lining of a woman during her menstrual cycle.

At which time is the woman most likely to be fertile?



37 When a breed of cattle with red coats is crossed with the same breed with white coats, the offspring all have coats with a mixture of red and white hairs, a condition called roan.

If roan cows were crossed with a red-coated bull, the theoretical ratio of the offspring would be

A all red.

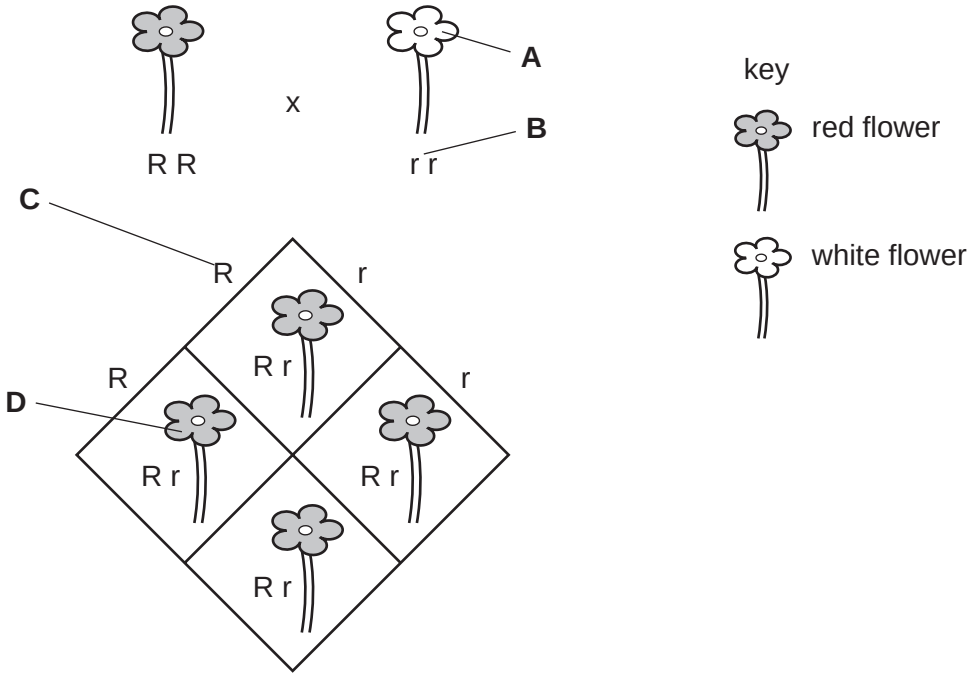
B all roan.

C 1 red : 1 roan.

D 3 red : 1 roan.

38 The diagram shows a simple genetic cross between a red flower and a white flower.

Which represents the dominant phenotype?



39 Six processes in genetic engineering are listed.

1 The bacterium is cloned.

2 The gene is copied.

3 The gene is switched on.

4 The gene is transferred into a bacterium.

5 The human gene is isolated.

6 The protein, insulin, is synthesised.

Which four processes, in the correct order, show the production of human insulin by bacteria?

A $2 \rightarrow 3 \rightarrow 5 \rightarrow 6$

B $3 \rightarrow 1 \rightarrow 4 \rightarrow 6$

C $5 \rightarrow 3 \rightarrow 2 \rightarrow 6$

D $5 \rightarrow 4 \rightarrow 1 \rightarrow 6$

40 Which blood group genotype is homozygous dominant?

A $I^A \ I^O$

B $I^A \ I^B$

C $I^B \ I^B$

D $I^O \ I^O$

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