Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/21**

Paper 2 Multiple Choice (Extended) **May/June 2022**

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- 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 multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

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1 All living organisms release energy from nutrient molecules within their cells.

What is the name of this characteristic?

A growth

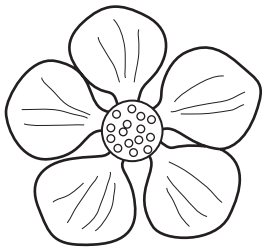
B nutrition

C respiration

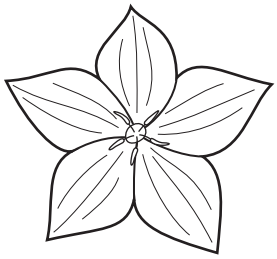
D sensitivity

2 Which diagram shows a flower from a monocotyledon?

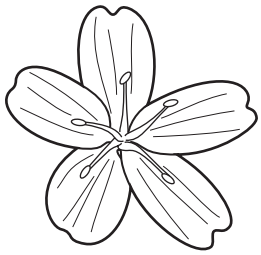
A



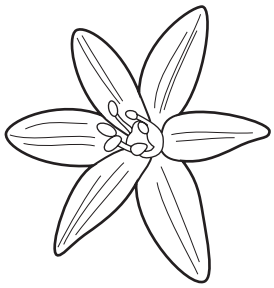
B



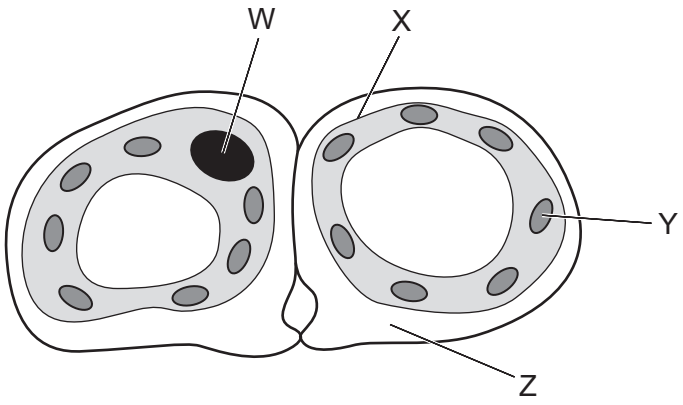
C



D



3 The diagram shows a cross-section through two guard cells of a leaf.

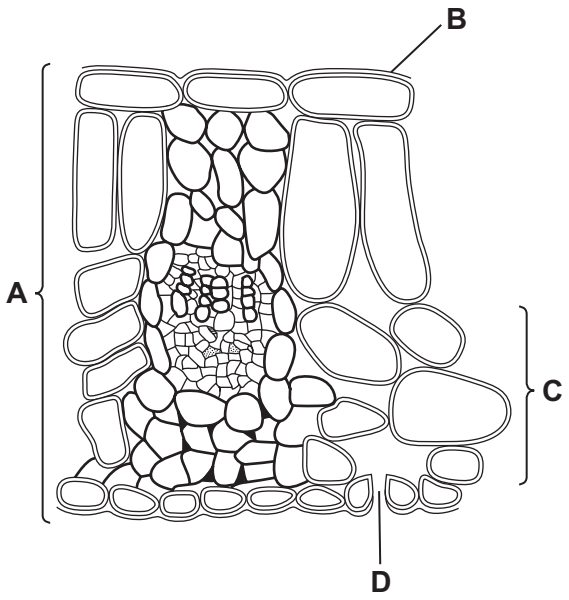


Which labelled structures would also be found in an animal cell?

A W and X **B** X and Y **C** Y and Z **D** Z and W

4 The diagram shows a cross-section through a leaf.

Which label shows a tissue?



5 Which statement describes the net movement of particles during diffusion?

A from higher to lower concentration down a concentration gradient

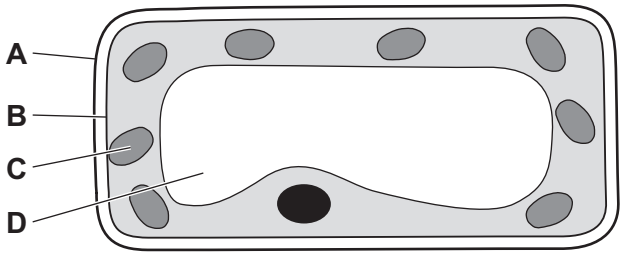
B from higher to lower concentration against a concentration gradient

C from lower to higher concentration down a concentration gradient

D from lower to higher concentration against a concentration gradient

6 The diagram shows a section through a mesophyll cell of a leaf.

Which part is partially permeable?



7 What are the smaller basic units of starch and glycogen molecules?

	starch	glycogen
A	amino acids	fatty acids and glycerol
B	amino acids	glucose
C	glucose	fatty acids and glycerol
D	glucose	glucose

8 In a length of DNA, 20% of the bases were T.

What is the percentage of base G in this length of DNA?

A 10% **B** 20% **C** 30% **D** 80%

9 Some terms used to describe enzyme-controlled reactions are listed.

1 catalyst

2 product

3 protein

4 substrate

Which terms describe an enzyme?

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

10 Which statement describes the effect of temperature on enzymes?

A High temperatures denature enzymes making it difficult for substrate molecules to fit into the active site.

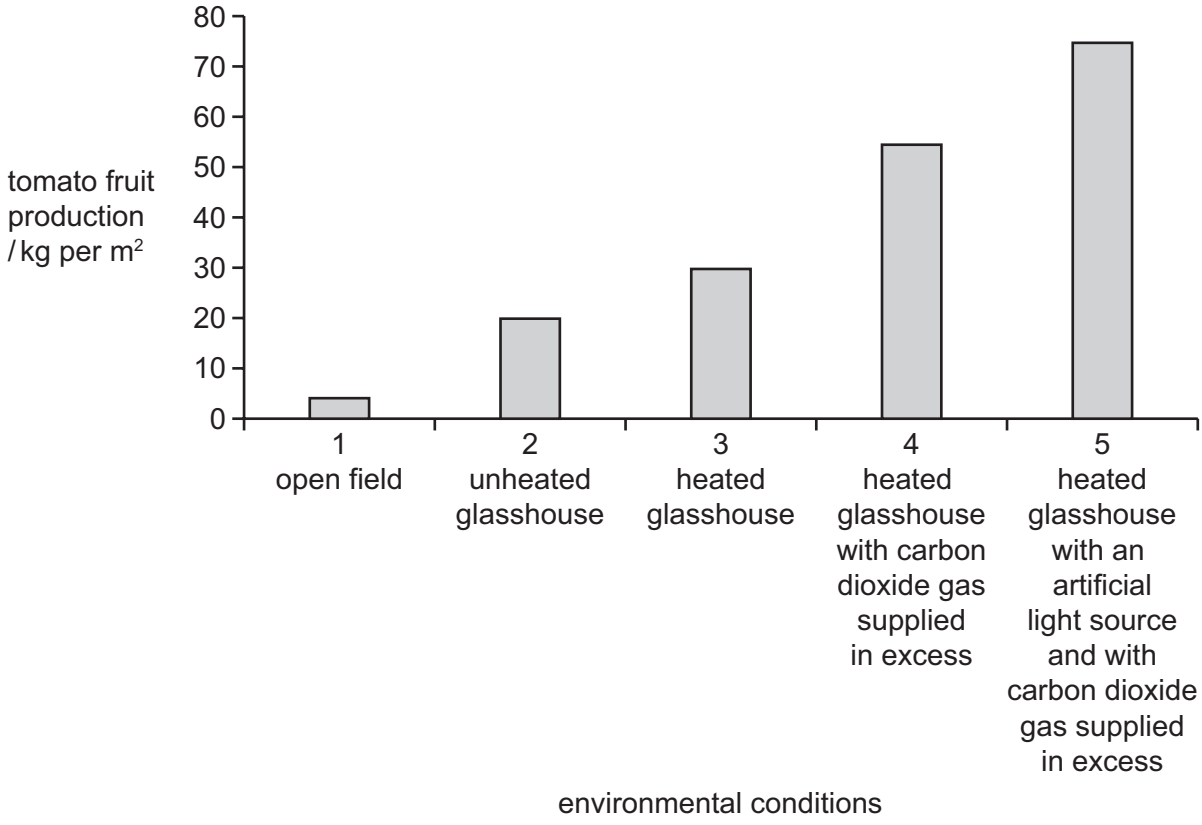
B High temperatures denature enzymes making it easy for substrate molecules to fit into the active site.

C Low temperatures denature enzymes making it difficult for substrate molecules to fit into the active site.

D Low temperatures denature enzymes making it easy for substrate molecules to fit into the active site.

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11 Tomato fruit production was measured in five different environmental conditions.



What is a correct conclusion for the data shown in the graph?

A There are no limiting factors in 1, so tomato fruit production is the lowest.

B Temperature is the limiting factor in 3.

C Carbon dioxide is the limiting factor in all five environmental conditions.

D Light is the limiting factor in 4.

12 How do the air spaces in the spongy mesophyll of a leaf help to adapt it for photosynthesis?

A They act as a store of oxygen.

B They allow carbon dioxide gas to diffuse through the leaf more rapidly.

C They increase the surface area for absorption of light energy.

D They let rainwater enter the leaf tissues.

13 What is the dietary importance of fibre in humans?

A for growth and repair of cells

B to help food move through the alimentary canal

C to maintain strong bones and teeth

D to provide energy

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14 In which part of the alimentary canal does ingestion take place?

A anus

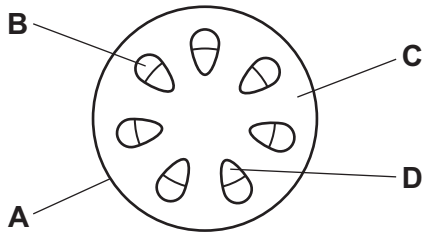
B liver

C mouth

D stomach

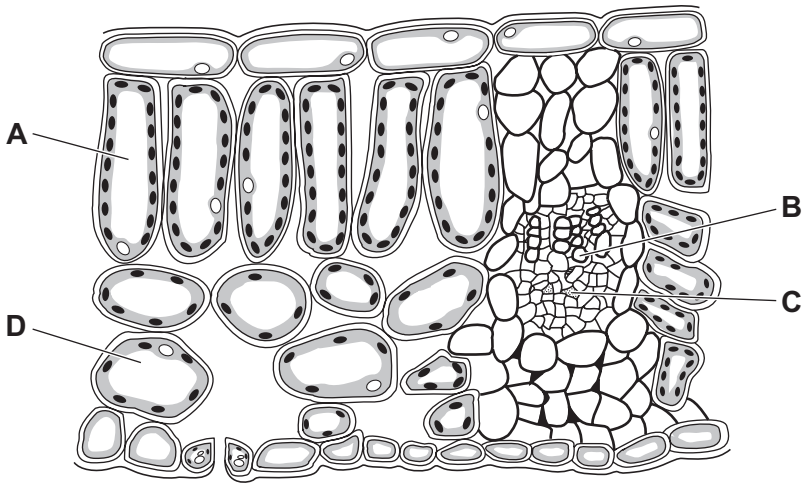
15 A non-woody plant stem is placed in water containing a red dye. It is left for one day and then a section of the stem is examined using a microscope.

Which tissue is stained red?

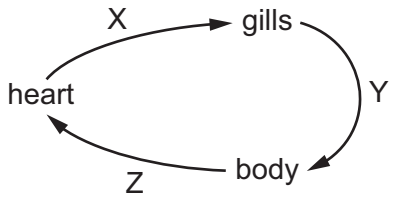


16 The diagram shows a cross-section through a leaf.

From which cell will most water evaporate during transpiration?



17 The diagram shows the circulatory system of a fish.



Where in the circulatory system is the oxygen concentration lowest?

A X only **B** X and Y **C** Y only **D** Y and Z

18 What is a function of the lymphatic system?

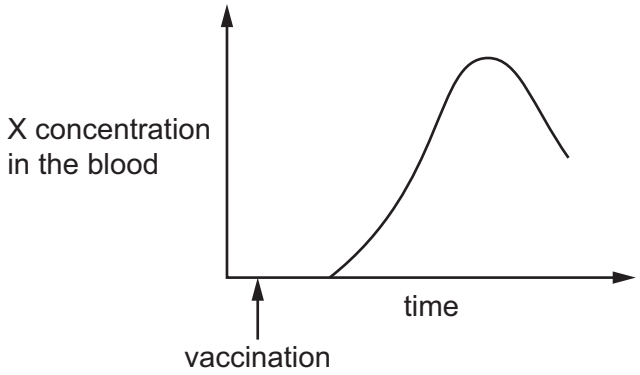
A absorption of glucose

B blood clotting

C circulation of body fluids

D temperature regulation

19 The graph shows the response of the body to vaccination.



Which word should be used to replace the letter X, to complete the label on the *y*-axis?

A antibody

B antigen

C pathogen

D platelet

20 Which cells produce mucus?

A ciliated cells

B goblet cells

C nerve cells

D white blood cells

21 Which row shows a change that occurs during ventilation?

	process	thorax pressure	thorax volume	air movement
A	expiration	decreases	increases	in
B	expiration	increases	decreases	out
C	inspiration	decreases	increases	out
D	inspiration	increases	decreases	in

22 What is the balanced chemical equation for anaerobic respiration in yeast?

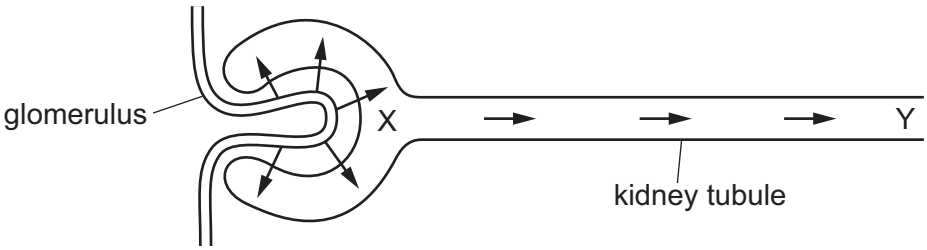
A $C_6H_{12}O_6 \rightarrow 2CO_2 + 6H_2O$

B $C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O$

C $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

D $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2H_2O$

23 Which statement correctly explains the difference in glucose concentration in the kidney tubule between X and Y?



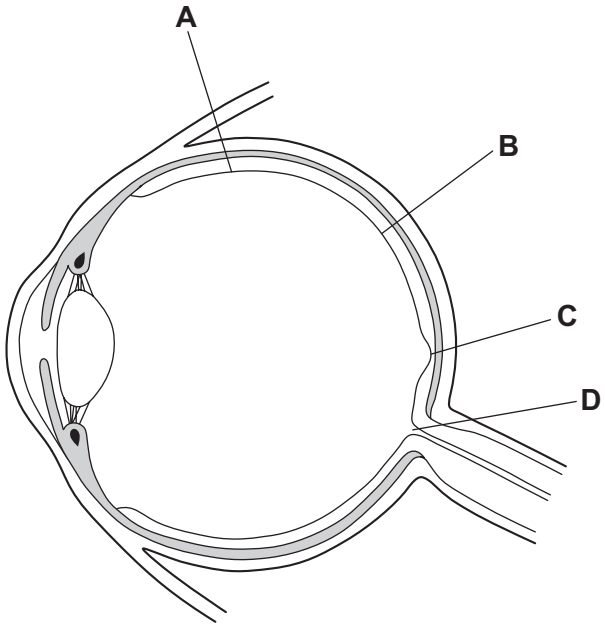
A The glucose concentration is higher at X than at Y because glucose moves out of the kidney tubule by osmosis.

B The glucose concentration is higher at X than at Y because glucose has been actively transported out of the kidney tubule.

C The glucose concentration is higher at Y than at X because glucose diffuses into the kidney tubule.

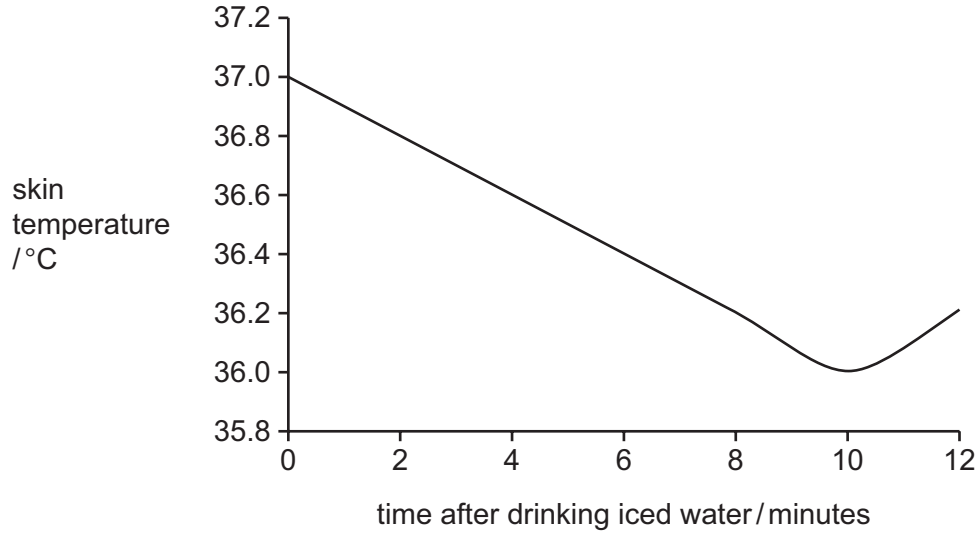
D The glucose concentration is higher at Y than at X because glucose is actively transported into the kidney tubule.

24 Where in the eye is the greatest concentration of cells that allow humans to see colour?



25 A scientist investigated the effect of drinking iced water on skin temperature. They drank a large volume of iced water and monitored the temperature of their skin.

The results are shown on the graph.



Which explanation of the change in skin temperature during the first 10 minutes is correct?

A Vasoconstriction occurred increasing blood flow to the skin.

B Vasoconstriction occurred reducing blood flow to the skin.

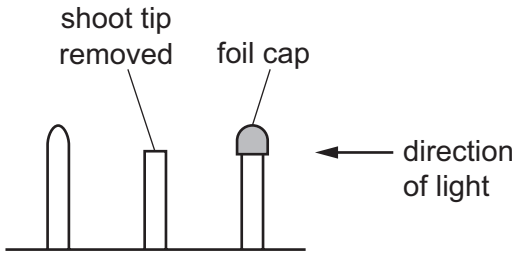
C Vasodilation occurred increasing blood flow to the skin.

D Vasodilation occurred reducing blood flow to the skin.

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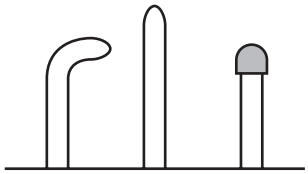
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26 An experiment was set up to investigate the growth of shoots in different conditions, as shown.

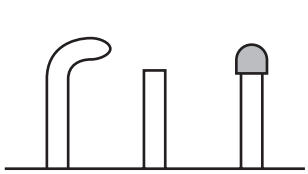


Which diagram shows the results that would be seen a few days later?

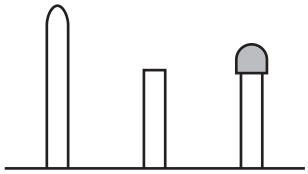
A



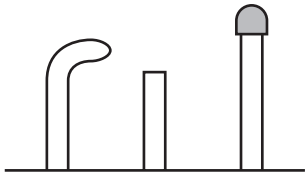
B



C



D



27 An advisor was presented with a list of statements for a discussion group with potential parents who were considering using *in vitro* fertilisation (IVF) to start a family.

Which statements about IVF are correct?

1 IVF is available to everyone.

2 IVF is 100% successful and therefore always leads to pregnancy.

3 IVF provides an opportunity for single parents to have a family.

4 IVF is not expensive and everyone can afford it.

5 Sperm or egg donation may be involved which means the couple are not always the biological parents.

A 1, 3 and 4 **B** 1, 2 and 4 **C** 2 and 5 **D** 3 and 5

28 Which sequence of structures does a pollen tube grow through in a flower?

A ovary → ovule → stigma → style

B ovary → stigma → ovule → style

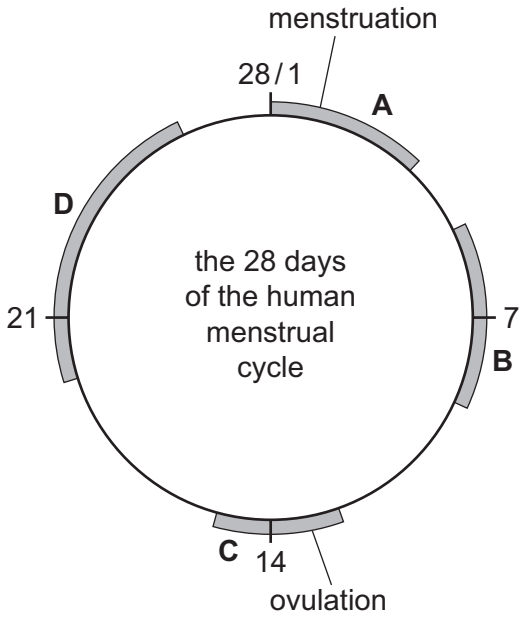
C stigma → style → ovary → ovule

D stigma → ovary → style → ovule

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29 The diagram shows some of the events of the menstrual cycle.

In which shaded zone of the cycle would progesterone levels be the highest?



30 What is needed in the cytoplasm to make proteins at a ribosome?

A DNA and amino acids

B DNA only

C mRNA and amino acids

D mRNA only

31 Pangolins are mammals. One species of pangolin has 40 chromosomes per body cell.

How many chromosomes will a sperm cell from this species of pangolin have?

A 10 **B** 20 **C** 40 **D** 50

32 Which adaptation is shown in the leaves of hydrophytes?

A hairs present on the upper and lower surfaces

B contain large air spaces

C stomata present on the lower surface only

D thick cuticle present on the upper and lower surfaces

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33 Sickle cell anaemia is a genetic disorder which results in severe illness in homozygous individuals. In some human populations, being heterozygous can be beneficial.

What could be the reason for this?

A Heterozygous individuals are not affected by the disorder.

B Heterozygous individuals are more resistant to malaria.

C The disorder is caused by a dominant allele.

D The disorder is sex-linked.

34 Which statement about selective breeding is correct?

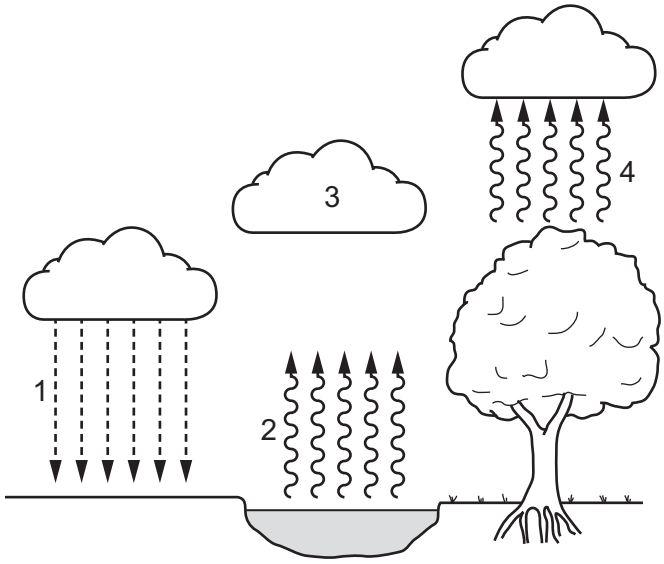
A It does not involve humans.

B It involves a struggle for survival.

C It always involves only one parent.

D It involves parents that possess desirable features.

35 The diagram shows the water cycle. Four different processes are numbered.



Which row identifies the processes correctly?

	condensation	evaporation	precipitation	transpiration
A	1	4	3	2
B	2	1	4	3
C	3	2	1	4
D	4	3	2	1

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36 A herd of red deer live in a forest that contains snakes and a large variety of birds.

Which group of organisms is an example of a population?

A all the animals in the forest

B all the red deer in the forest

C all the organisms in the forest

D all the plants in the forest

37 With which kingdoms do bacteria share the same genetic code?

A animal, plant, fungus and protoctist

B animal, plant and fungus only

C animal and plant only

D animal only

38 Which process makes use of a genetically engineered organism?

A using bacteria to produce insulin

B using enzymes in biological washing powders

C using pectinase in fruit juice production

D using yeast to produce ethanol

39 What is a reason for conserving plant species?

A to absorb oxygen from the air

B to decrease rainfall

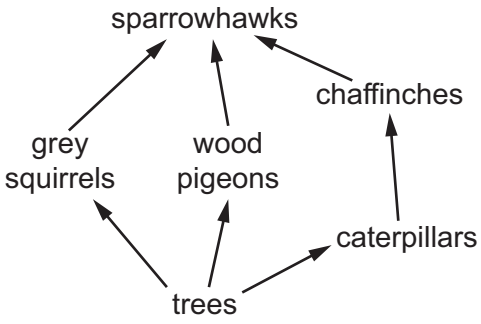
C to obtain drugs for medicinal use

D to release carbon dioxide into the air

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[Turn over

40 The food web shows the feeding relationships in a woodland.



If all the chaffinches in the food web die, which effect would this have?

A The amount of damage to trees will increase.

B The food supply for grey squirrels will increase.

C The number of wood pigeons will increase.

D The population of caterpillars will decrease.

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