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Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/21**

Paper 2 Multiple Choice (Extended) **May/June 2019**

45 minutes

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

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, 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 syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages and **3** blank pages.

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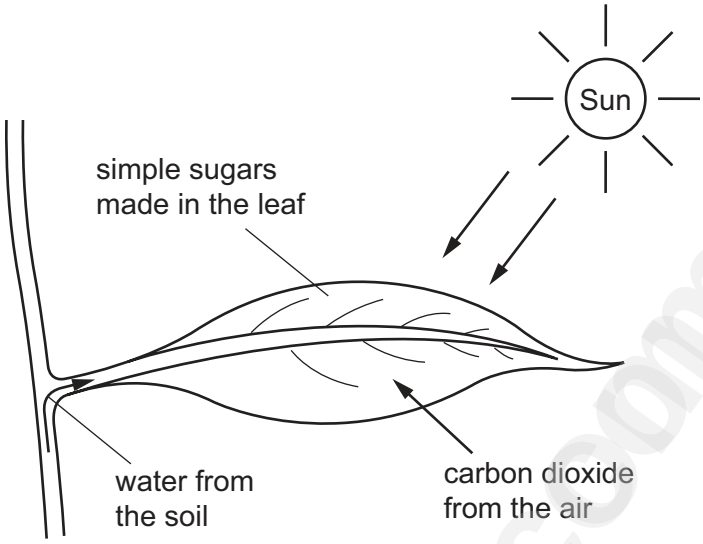
1 The diagram shows a leaf on a plant.



Which characteristic of life is represented by this diagram?

A excretion

B nutrition

C respiration

D sensitivity

2 The diagram shows how *Homo sapiens* (modern people) could have evolved from earlier ancestors.

Homo sapiens (modern people)
↑
Homo heidelbergensis
↑
Homo erectus
↑
Homo habilis

Which statement about modern people and their ancestors is correct?

A They are in the same species and the same genus.

B They are in the same species but not the same genus.

C They are in the same genus but not the same species.

D They are neither the same species nor the same genus.

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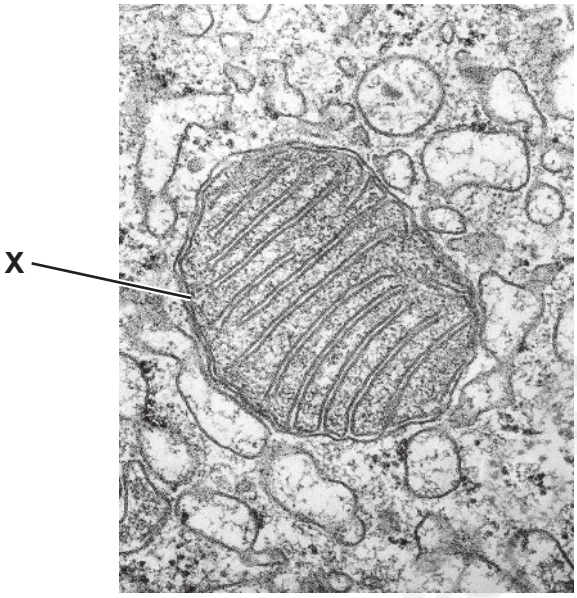
3 The photomicrograph shows part of an animal cell.



What is the structure labelled **X**?

A chloroplast

B mitochondrion

C ribosome

D vacuole

4 Which features are possessed by **all** plant cells?

	a cell wall	chloroplasts
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key
✓ = present
✗ = absent

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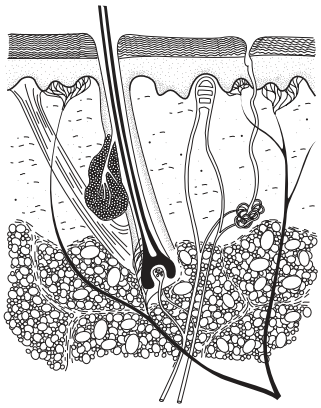
5 The diagram shows part of the skin.



What is the correct level of organisation for the skin?

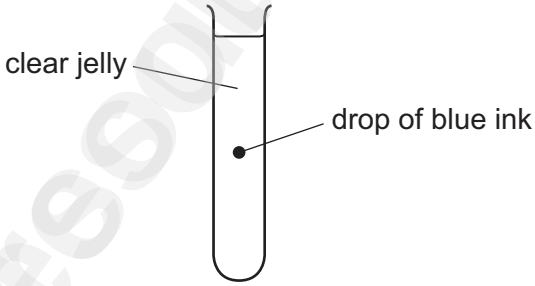
A cell

B organ

C organ system

D tissue

6 The diagram shows a test-tube containing clear jelly. A drop of blue ink is injected into the middle of the jelly.



The blue colour of the ink spreads throughout the jelly.

By which process does the blue ink spread through the jelly?

A active transport

B catalysis

C diffusion

D osmosis

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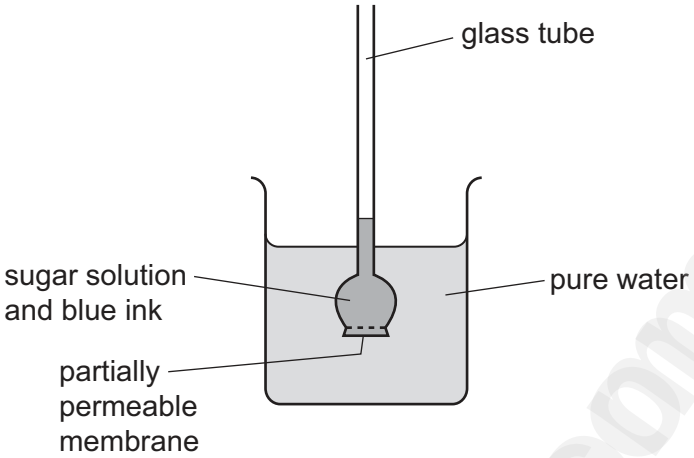
7 The apparatus shown was set up.



Some hours later, the water in the beaker had turned blue, and the liquid in the glass tube had moved upwards.

Which processes caused these changes?

	water turned blue	liquid in glass tube moved upwards
A	osmosis	diffusion
B	active transport	osmosis
C	diffusion	active transport
D	diffusion	osmosis

8 Four solutions were tested to see whether they contained protein, starch or glucose.

The colours of the solutions after the tests are recorded in the table.

Which solution contained protein and glucose but **not** starch?

	biuret test	iodine test	Benedict's test
A	blue	brown	orange
B	blue	blue-black	blue
C	purple	brown	orange
D	purple	blue-black	blue

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9 Small molecules are used as the basic units in the synthesis of large food molecules.

Which statement is correct?

A Amino acids are basic units of carbohydrates.

B Fatty acids are basic units of glycogen.

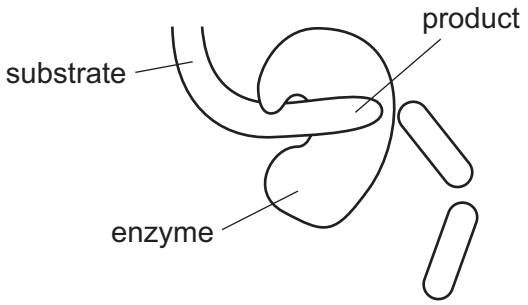
C Glycerol is a basic unit of oils.

D Simple sugar is a basic unit of protein.

10 The diagrams show a protease enzyme catalysing the breaking of part of a protein molecule into smaller pieces.

Which diagram has three correct labels?

A



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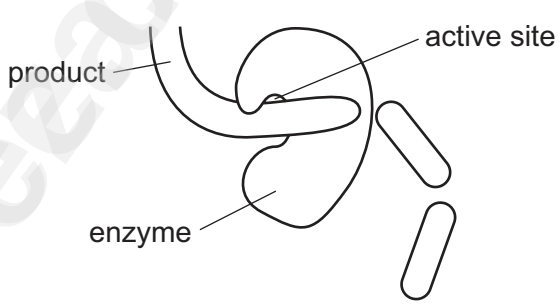

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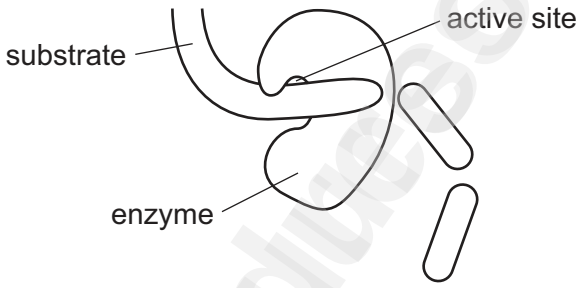

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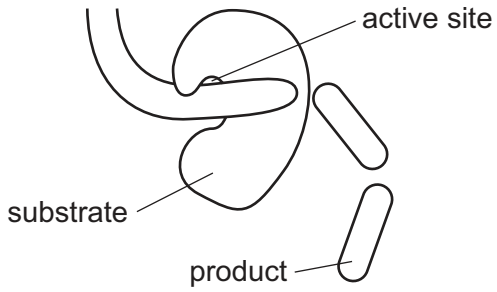

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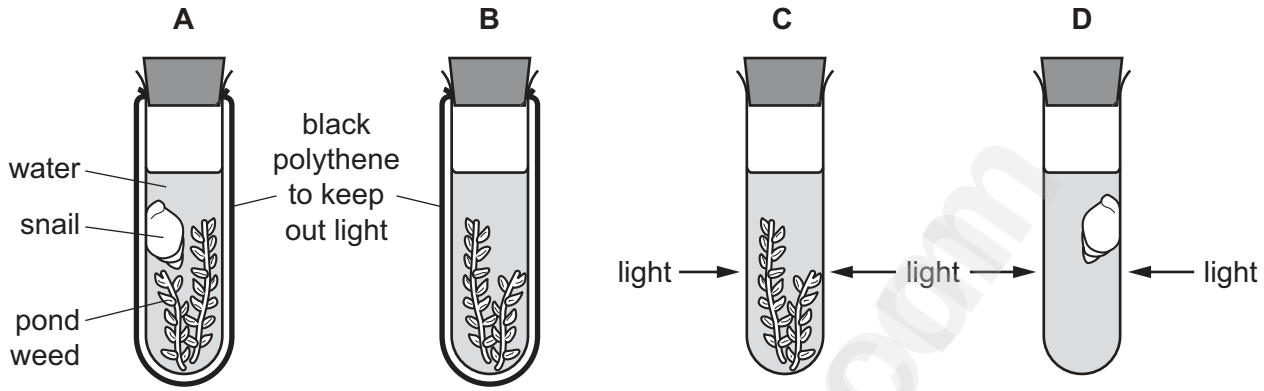
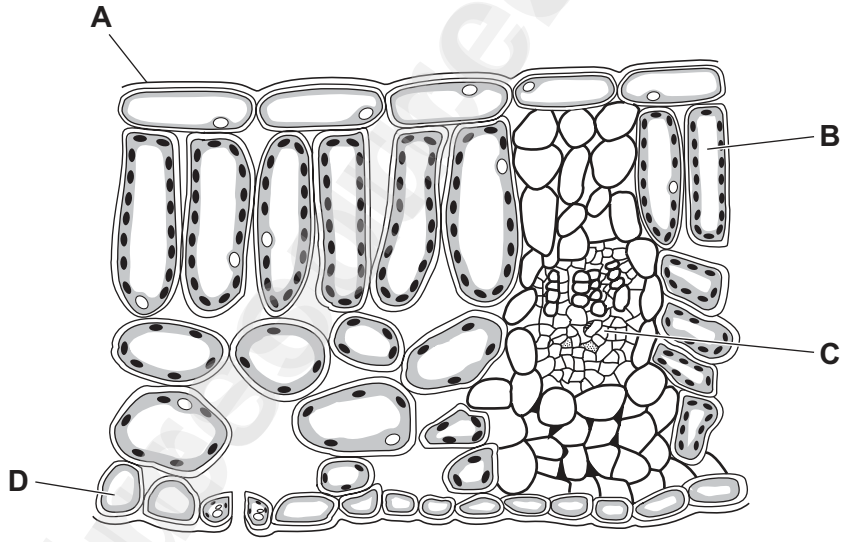
11 The diagram shows an experiment to investigate the balance between respiration and photosynthesis.

In which tube are photosynthesis and respiration taking place at the same time?



12 The diagram shows a cross-section of a leaf as seen under a microscope.

Which structure is a palisade mesophyll cell?



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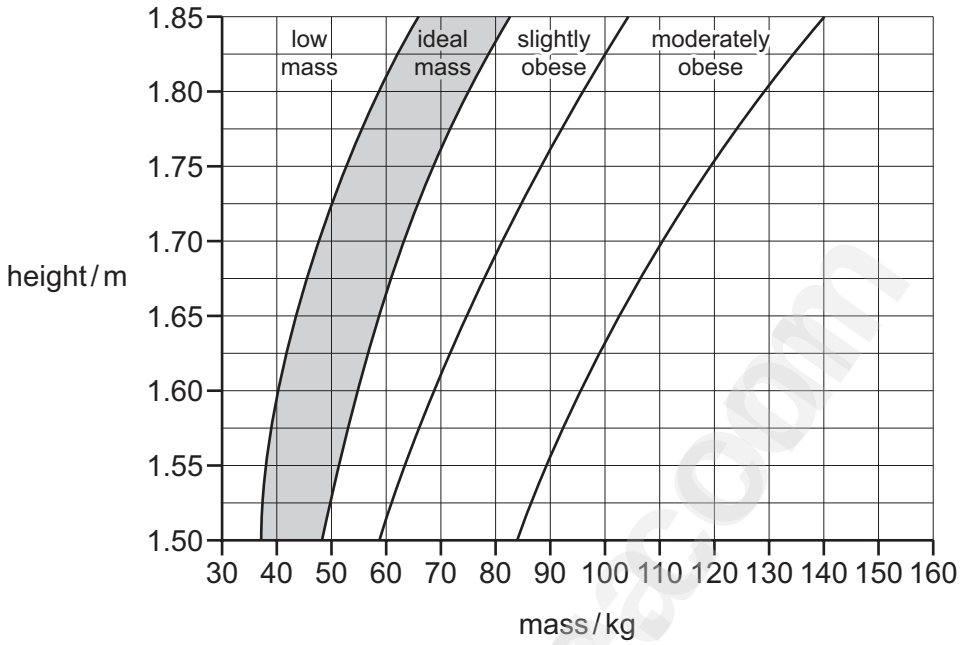
13 The chart is used to find a person's recommended mass.



For the data provided about body mass and height, which person would benefit most from the introduction of a calorie-controlled diet and regular exercise?

	body mass / kg	height / m
A	40	1.55
B	50	1.75
C	70	1.80
D	90	1.75

14 The cholera bacterium produces toxins that cause chloride ions to be secreted into the small intestine.

How does this affect the water potential of blood in the intestinal capillaries and the intestinal contents?

	water potential	
	blood in capillaries	contents of small intestine
A	lowered	lowered
B	lowered	raised
C	raised	lowered
D	raised	raised

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15 A student investigates the breakdown of fats in milk by lipase. Four test-tubes labelled A to D are set up.

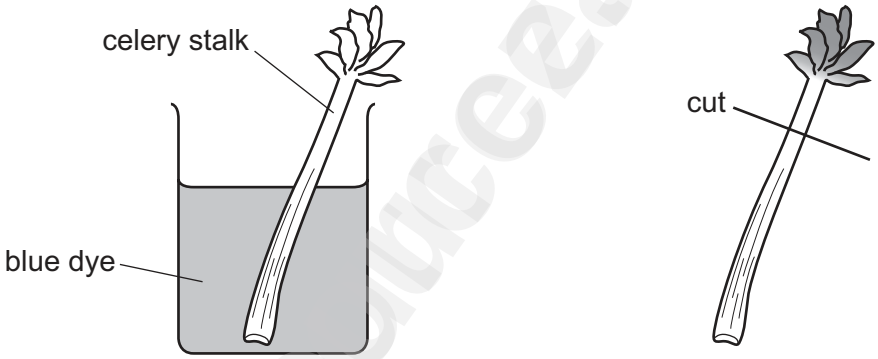
The table shows the contents of each test-tube.

In which test-tube will the contents become acidic most quickly?

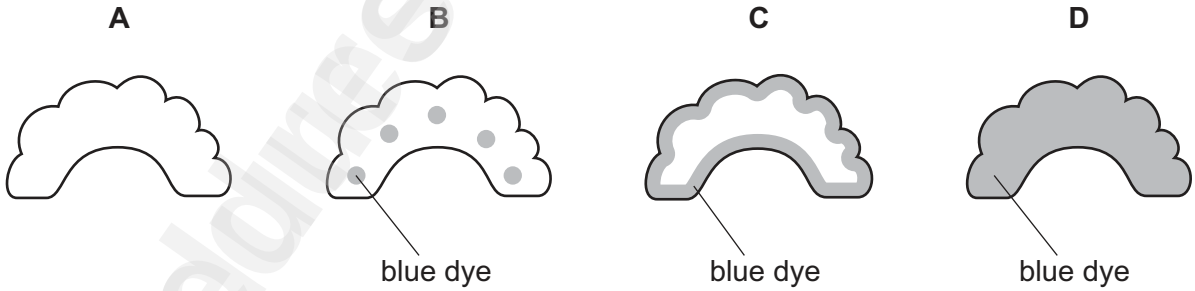
	milk	bile	boiled lipase	lipase
A	✓	✓	✗	✓
B	✓	✓	✓	✗
C	✓	✗	✓	✗
D	✓	✗	✗	✓

key
✓ = present
✗ = absent

16 A celery stalk was placed into a beaker of blue dye. When the dye reached the leaves, the stalk was taken out and a section was cut, as shown in the diagram.



Which diagram shows the appearance of the cut end of the stalk?



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17 The table shows the rate of water flow through a tree over a 12 hour period.

time of day	rate of flow / cm per hour
7:00	100
9:00	120
11:00	140
13:00	250
15:00	300
17:00	260
19:00	180

What conclusion can be drawn from the table?

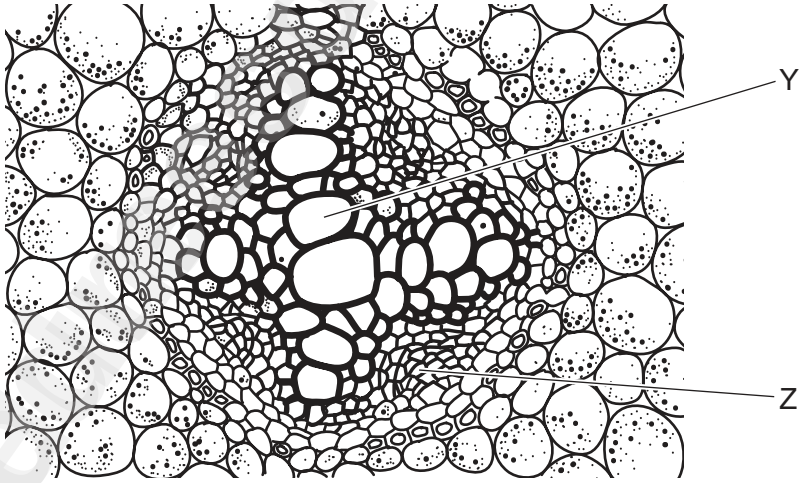
A Between 7:00 and 17:00 hours the rate of flow continuously increases.

B The greatest increase in rate of flow in a two-hour period is between 11:00 and 13:00 hours.

C Water does not flow up through a tree at night.

D Water flow is affected by humidity.

18 The diagram shows some of the transport tissues in a plant root.



Which row about tissues Y and Z in the diagram is correct?

	tissue Y		tissue Z	
	name	transports	name	transports
A	phloem	mineral ions & water	xylem	sucrose
B	phloem	sucrose	xylem	mineral ions & water
C	xylem	mineral ions & water	phloem	sucrose
D	xylem	sucrose	phloem	mineral ions & water

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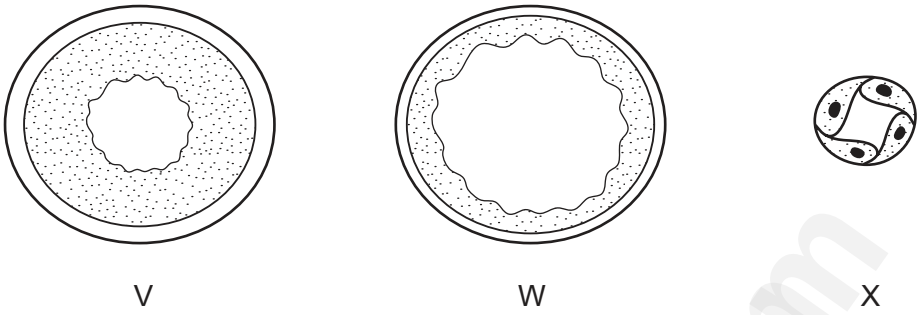
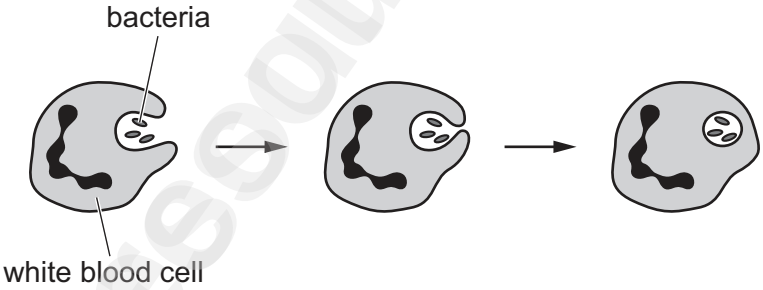
19 The diagram shows cross-sections through three types of blood vessel, **not** drawn to the same scale.



Which section is from a vein and which is from a capillary?

	vein	capillary
A	V	W
B	W	V
C	W	X
D	X	W

20 The diagram shows one way the body defends itself against pathogens.



What is the name of this defence mechanism?

A antibody production

B egestion

C phagocytosis

D vaccination

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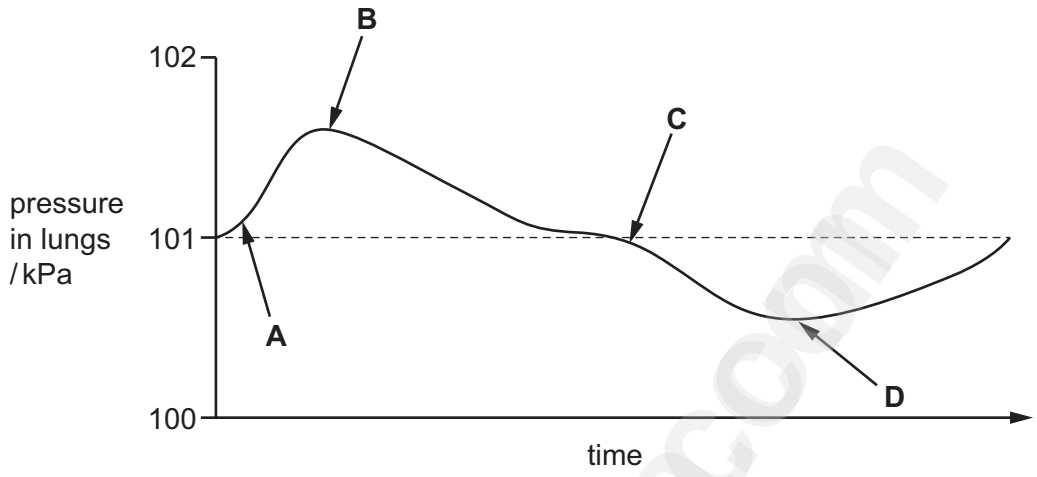
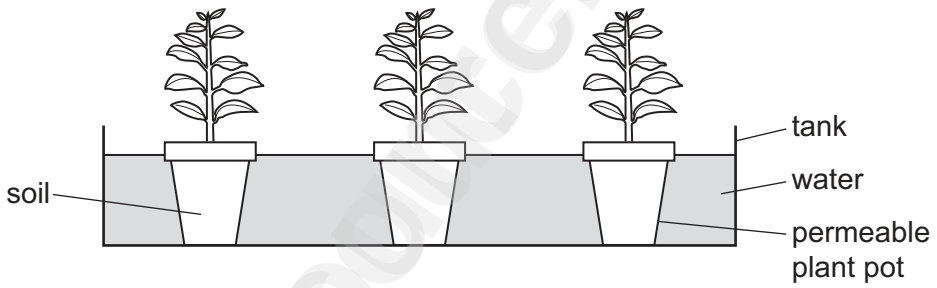
21 The diagram illustrates changes in air pressure taking place inside the lungs during a complete cycle of breathing. Atmospheric pressure is 101 kPa.

At which point on the diagram are the ribs beginning to be lowered?



22 Potted plants are left for a week in a tank of water as shown.



Why do the plants die?

A The roots do not have enough oxygen.

B The roots do not have enough water.

C The roots have too much oxygen.

D The roots have too much carbon dioxide.

23 Which statement about both aerobic and anaerobic respiration is correct?

A They break down $C_6H_{12}O_6$.

B They produce an oxygen debt.

C They use CO_2.

D They use O_2.

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24 The components of a reflex arc are shown in the flow diagram.

receptor → sensory neurone → synapse → relay neurone → synapse → motor neurone → effector

Which component is responsible for ensuring that the nerve impulses travel in one direction only?

A motor neurone

B receptor

C sensory neurone

D synapse

25 What is a function of the liver?

A converting bile to urea

B converting urea to amino acids

C deamination of amino acids

D deamination of carbon dioxide

26 Which statement about light receptors in the retina of a normal human eye is correct?

A The cones only work in dim light.

B The rods are found in the fovea.

C There are three types of cone.

D There are three types of rod.

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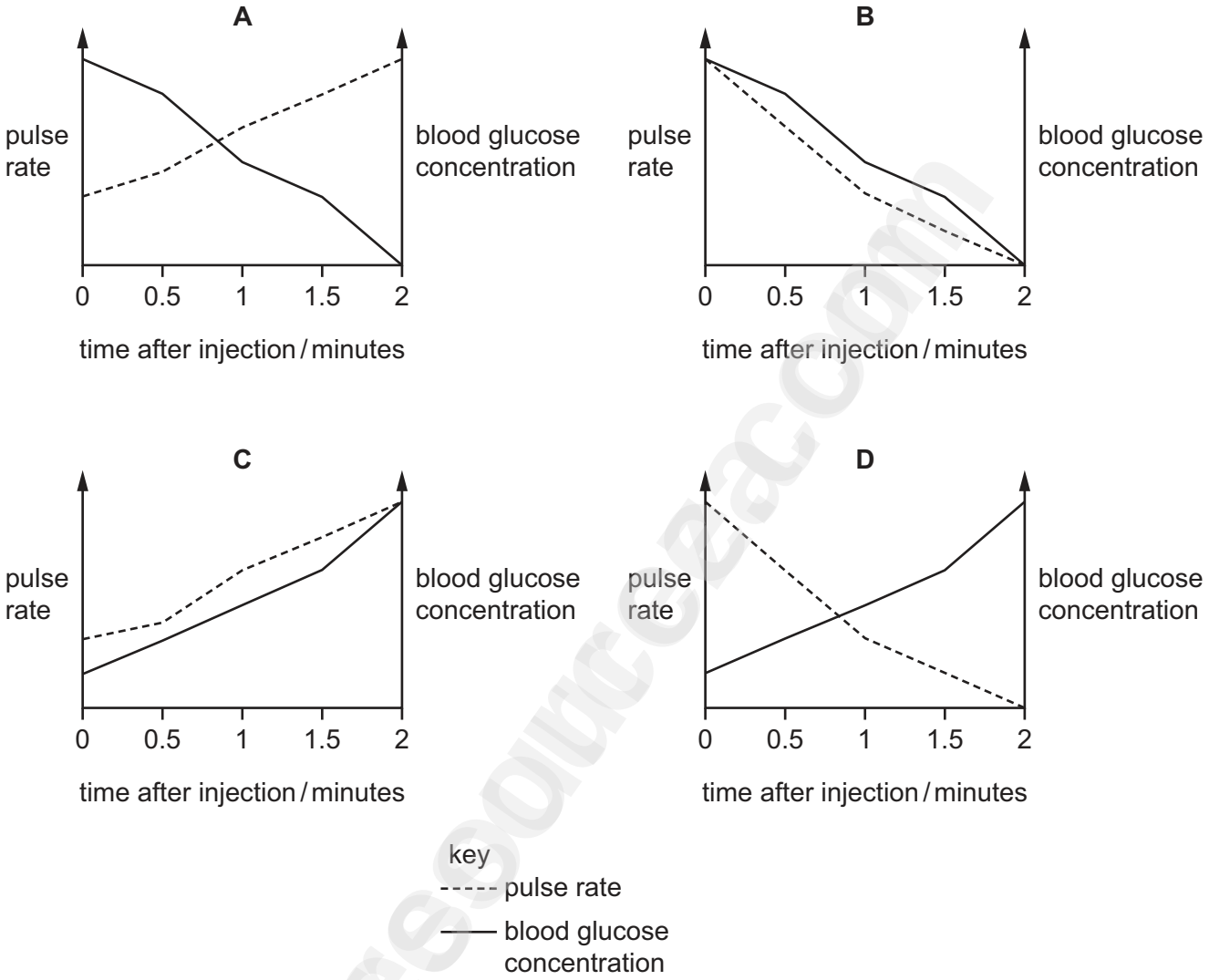
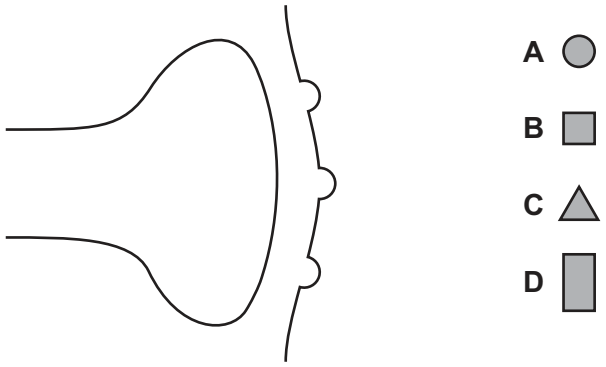
27 A patient is injected with adrenaline.

Which graph shows the expected changes to pulse rate and blood glucose concentration?



28 The diagram represents a synapse in the brain involved in the perception of pain.

Which labelled molecule represents heroin?



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29 A human zygote is a diploid cell.

Which statement about human diploid cells is correct?

A They do not have a nucleus.

B They fuse to form gametes.

C The nucleus contains a single set of chromosomes.

D The nucleus contains two sets of chromosomes.

30 Which feature allows the sperm to dissolve the jelly coating of the egg cell?

A acrosome

B flagellum

C mitochondria

D nucleus

31 Which statement about HIV is correct?

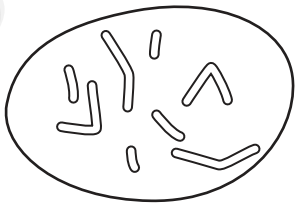
A It causes an increase in the number of lymphocytes.

B It is caused by bacteria.

C It increases the ability to produce antibodies.

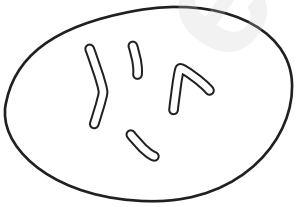
D It is transmitted through sexual contact.

32 The diagram shows the chromosomes in the nucleus of a cell that divides by mitosis.

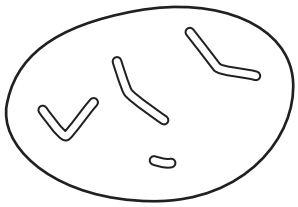


Which diagram shows the chromosomes in the nucleus of one of the daughter cells produced?

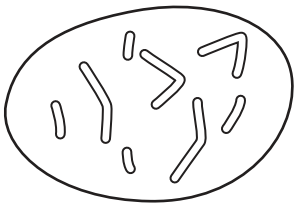
A



B



C



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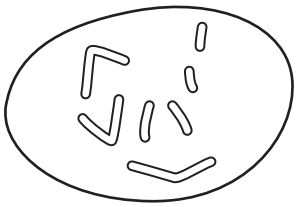

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33 What happens as a result of meiosis?

A Diploid cells are produced.

B Diploid and haploid cells are produced.

C Genetically identical cells are produced.

D Haploid cells are produced.

34 Why is the allele for sickle-cell anaemia common in some parts of the world?

A Malaria protects against sickle-cell anaemia.

B Sickle-cell anaemia is caused by malaria.

C Sickle-cell anaemia is transmitted by mosquitoes.

D The sickle-cell anaemia allele protects against malaria.

35 Which statement describes how a species becomes adapted to its environment?

A Genetic similarities give rise to different genotypes which may have a reproductive advantage.

B Genetic variation gives rise to different phenotypes which may have a reproductive advantage.

C Phenotypic similarities give rise to different genotypes which may have a reproductive advantage.

D Phenotypic variation gives rise to different phenotypes which may have a reproductive advantage.

36 Decomposers play an important role in the carbon cycle. They release carbon dioxide.

Which process is responsible for this?

A feeding

B fossilisation

C photosynthesis

D respiration

37 Which term describes a group of organisms of one species, living in the same area, at the same time?

A community

B ecosystem

C genus

D population

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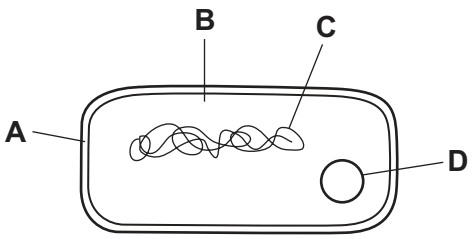
38 The diagram shows a bacterial cell.

Which part of its structure is particularly useful in genetic engineering?



39 What can be managed sustainably?

A taking coal from a coalfield

B taking gas from under the earth's surface

C taking oil from an oilfield

D taking wood from a woodland

40 Large areas of tropical forests have been cleared to grow monocultures of palm oil plants.

Which effect will this have on the ecosystem?

A The use of fossil fuels in the area will decrease.

B The use of pesticides in the area will decrease.

C The variety of species in the area will decrease.

D The variety of species in the area will increase.

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