Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **May/June 2024**

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.

This document has **16** pages.

[Turn over

1 Which process is carried out by all organisms?

A growth

B photosynthesis

C sexual reproduction

D transpiration

2 What is the first part of the scientific name of an organism, using the binomial system?

A genus

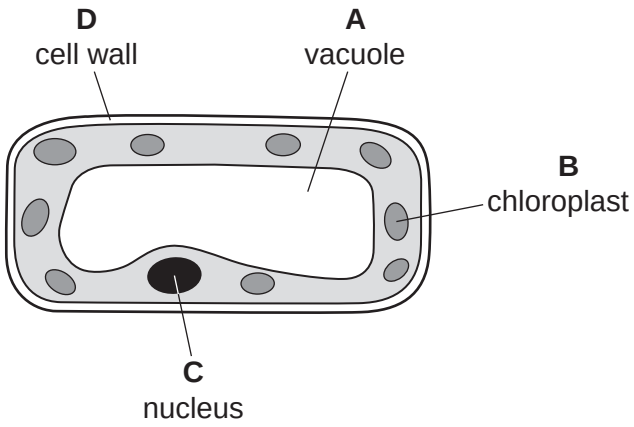
B group

C kingdom

D species

3 The diagram shows a plant cell.

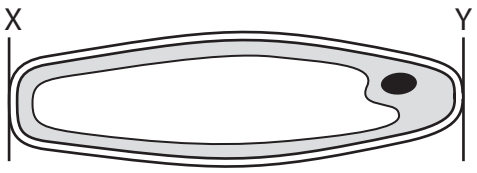
In which labelled part of the cell is glucose made?



4 The diagram shows an epidermal cell from an onion plant.

The distance between X and Y on the diagram is 60 mm.

The actual length of the cell between X and Y is 150 µm.



What is the magnification of the cell?

A ×40 **B** ×250 **C** ×400 **D** ×2500

5 Some plant cells are placed in distilled water for 1 hour.

Which description of the condition of the plant cells after 1 hour is correct?

A burst

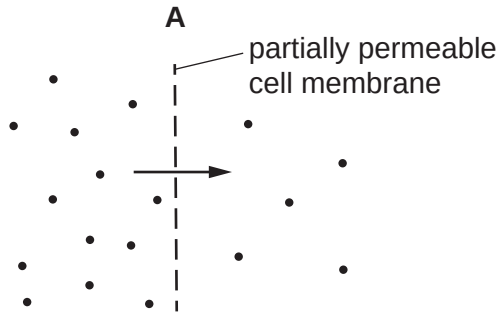
B flaccid

C plasmolysed

D turgid

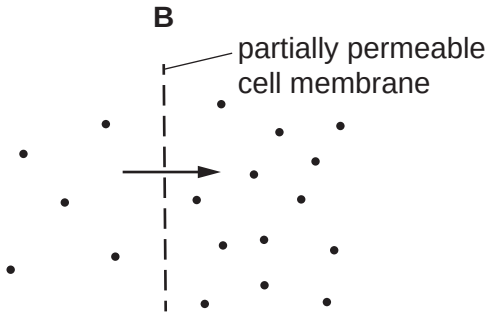
6 Which diagram represents active transport?

A



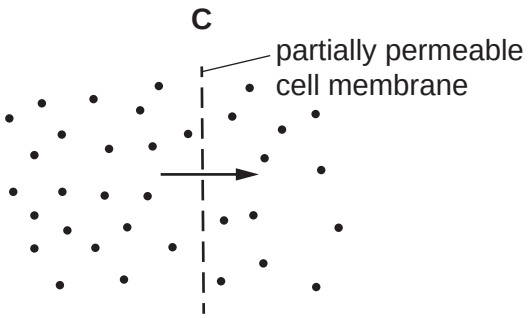
requires energy
from respiration

B



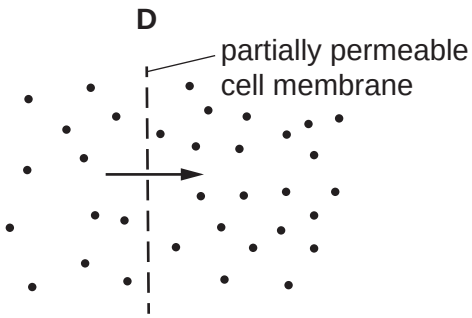
requires energy
from respiration

C



does **not** require energy
from respiration

D



does **not** require energy
from respiration

7 The diagram shows the bases in a section of DNA from one strand only.

A–C–T–T–C–A–G–T–C

What is the base sequence on the complementary DNA strand?

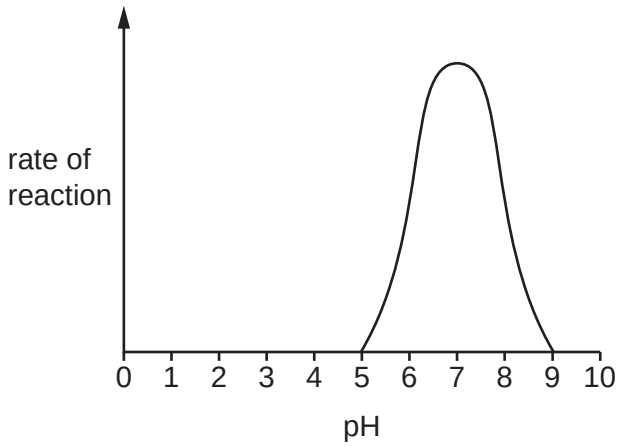
A G–C–T–T–C–G–A–T–C

B G–T–C–C–T–G–A–C–T

C T–C–A–A–C–T–G–A–C

D T–G–A–A–G–T–C–A–G

8 The graph shows the effect of pH on the rate of an enzyme-catalysed reaction.



What explains the effect of pH on the reaction rate?

A As the pH increases from 5 to 7, the kinetic energy increases.

B As the pH increases from 7 to 9, the frequency of enzyme and substrate collisions increases.

C The shape of the enzyme's active site changes as the pH increases from 7 to 9.

D The substrate denatures at pH 7.

9 Which sentence explains the importance of vascular bundles for photosynthesis?

A Vascular bundles transport carbon dioxide to the leaf.

B Vascular bundles transport oxygen to the leaf.

C Vascular bundles transport starch to the leaf.

D Vascular bundles transport water to the leaf.

10 Which substance is the product of protein digestion?

A amino acids

B fatty acids

C glucose

D glycerol

11 Which organ produces amylase?

A gall bladder

B kidney

C oesophagus

D pancreas

12 Which substance is absorbed by lacteals in villi?

A amino acids

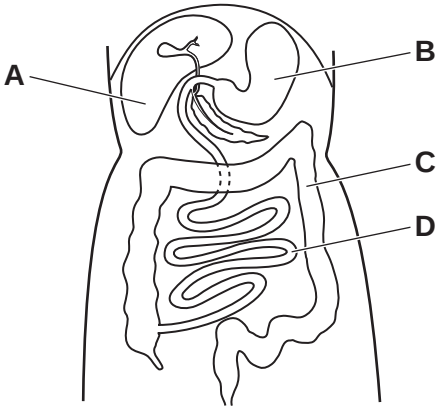
B fatty acids

C lactic acid

D hydrochloric acid

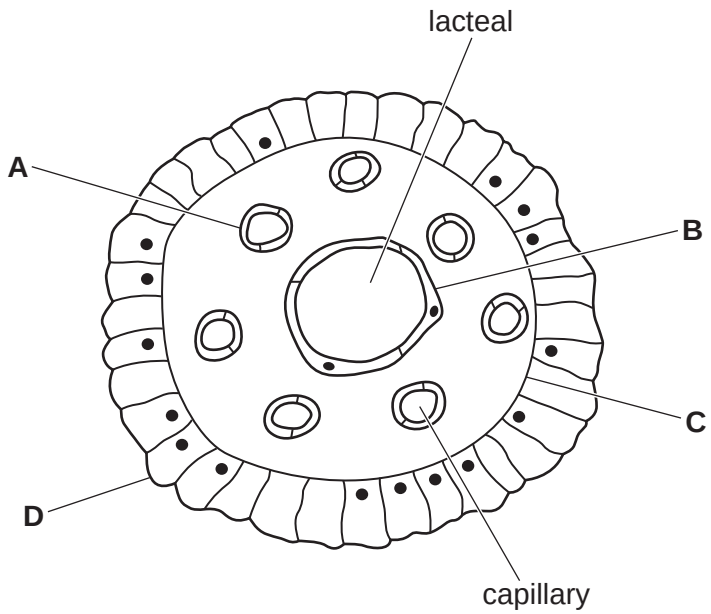
13 The diagram shows part of the alimentary canal.

Where is most water absorbed?



14 The diagram shows a cross-section of a villus.

On which cell surface are microvilli found?



15 Which feature of xylem vessels provides support to plants?

A cells are joined end to end

B no cell contents

C no cross-walls

D lignin present

16 Which change in an environmental factor will **increase** the rate of transpiration?

A decreasing humidity

B decreasing light intensity

C decreasing temperature

D decreasing wind speed

17 Which statement describes translocation?

A the movement of amino acids and sucrose from the source to the sink in phloem

B the movement of amino acids and sucrose from the source to the sink in xylem

C the movement of amino acids and sucrose from the sink to the source in phloem

D the movement of amino acids and sucrose from the sink to the source in xylem

18 Which pathway is taken by blood in a fish?

A gills → heart → body → gills

B body → gills → heart → body

C heart → gills → body → heart

D heart → body → gills → body

19 Which component of blood produces antibodies?

A plasma

B platelets

C red blood cells

D white blood cells

20 The cholera bacterium produces a toxin which affects humans.

What is an effect of this toxin on the human body?

A the secretion of chloride ions from the blood into the lumen of the large intestine

B the secretion of chloride ions from the blood into the lumen of the small intestine

C the secretion of chloride ions from the lumen of the large intestine into the blood

D the secretion of chloride ions from the lumen of the small intestine into the blood

21 These changes occur in the human body during exercise.

1 breathing rate increases

2 the rate of respiration increases

3 nerve impulses sent from the brain to the intercostal muscles and diaphragm

4 receptors in the brain detect increased concentration of carbon dioxide in the blood

What is the correct order for these changes?

A 1 → 2 → 4 → 3

B 1 → 3 → 4 → 2

C 2 → 1 → 4 → 3

D 2 → 4 → 3 → 1

22 Two molecules of glucose are aerobically respired.

How many molecules of water are produced?

A 1 **B** 2 **C** 6 **D** 12

23 Which substance has a higher concentration in the renal vein than in the renal artery?

A carbon dioxide

B glucose

C oxygen

D urea

24 Where are amino acids deaminated and converted into urea?

A bladder

B kidneys

C liver

D pancreas

25 Which process moves neurotransmitters across a synapse?

A active transport

B diffusion

C gravity

D osmosis

26 When the blood glucose concentration is low, which hormone is released and which organ releases it?

	hormone	organ
A	glucagon	liver
B	glucagon	pancreas
C	insulin	liver
D	insulin	pancreas

27 A shoot grows towards the direction of light.

These statements compare shoot cells on the side in the light with cells on the side in the shade.

1 Cells on the side in the light have more auxin.

2 Cells on the side in the shade have more auxin.

3 Cells on the side in the light elongate more.

4 Cells on the side in the shade elongate more.

Which statements explain why the shoot grows towards the light?

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

28 Which statement about antibiotics is correct?

A Antibiotics are used to treat all transmissible diseases.

B Antibiotics are used to treat diseases caused by viruses.

C Antibiotic resistance can be stopped by increasing their use.

D Antibiotics are used to treat diseases caused by bacteria.

29 ***Fusarium*** wilt is a fungal disease of bananas that can spread quickly through a banana population.

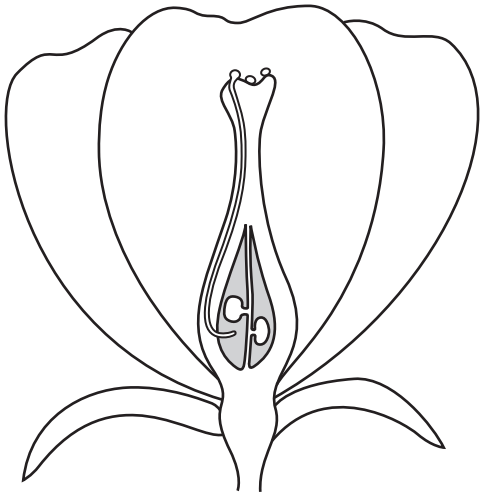
The table shows the area affected by ***Fusarium*** wilt over time in one country.

year	area affected with ***Fusarium*** wilt / hectares
1967	0
1970	100
1976	1200
1983	1500
1999	3000

What was the percentage increase in the area affected with ***Fusarium*** wilt from 1976 to 1999?

A 40% **B** 60% **C** 150% **D** 250%

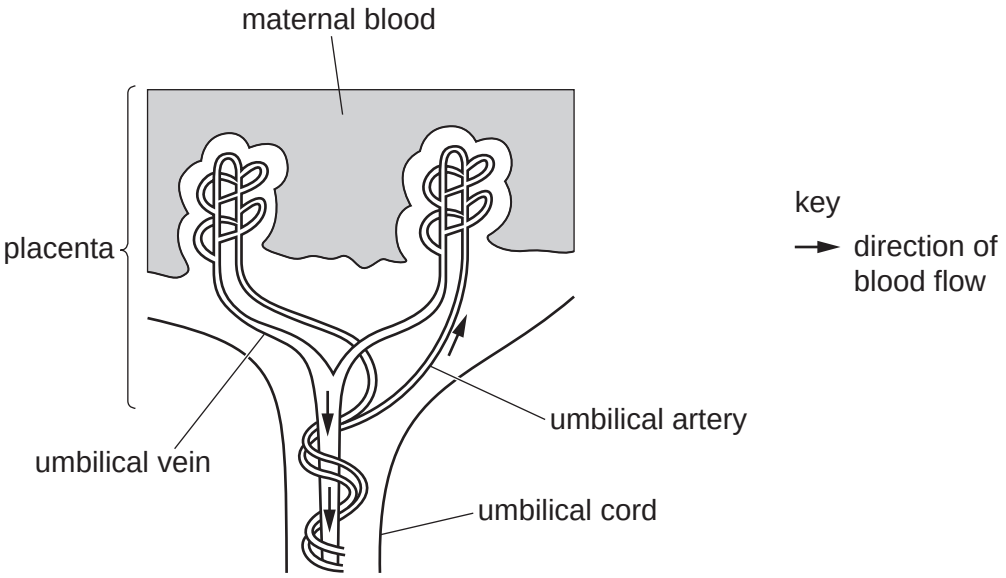
30 The diagram shows part of a flower.



Which processes have taken place?

	pollination	fertilisation
A	no	no
B	no	yes
C	yes	no
D	yes	yes

31 The diagram shows part of a placenta and umbilical cord.



What is the function of the umbilical vein?

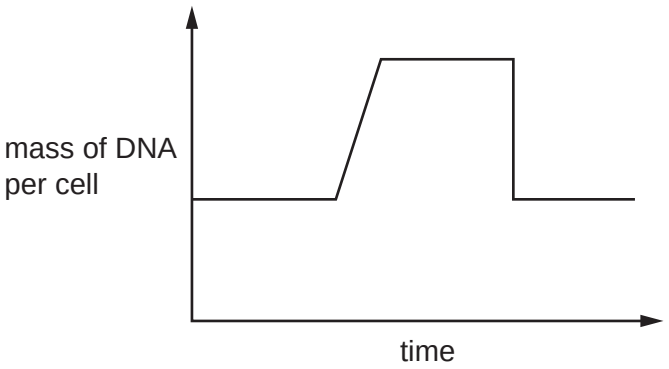
A to stop pathogens passing into the fetus

B to stop toxins passing into the fetus

C to transport carbon dioxide away from the fetus

D to transport oxygen to the fetus

32 The graph shows how the mass of DNA per cell changes before, during and after a nuclear division in a diploid cell.



Which row describes the type of nuclear division and the chromosome number of the daughter cells shown in the graph?

	type of nuclear division	chromosome number of daughter cells produced
A	meiosis	diploid
B	meiosis	haploid
C	mitosis	diploid
D	mitosis	haploid

33 In a family, the two parents have blood groups of A and B and the three children have blood groups of B, B and O.

What are the genotypes of the parents?

A $\mathbf{I^AI^A}$ and $\mathbf{I^BI^B}$

B $\mathbf{I^AI^B}$ and $\mathbf{I^AI^o}$

C $\mathbf{I^AI^o}$ and $\mathbf{I^BI^o}$

D $\mathbf{I^BI^o}$ and $\mathbf{I^BI^A}$

34 Which statement describes a type of variation?

A Continuous variation is usually caused by the environment only.

B Continuous variation results in a limited range of phenotypes with no intermediates.

C Discontinuous variation is usually caused by genes only.

D Discontinuous variation results in a range of phenotypes between two extremes.

35 The photograph shows a water lily plant, which is a hydrophyte.

Which statement explains why the stomata are located on the upper surface of the leaf?

A to allow carbon dioxide from the air to enter the leaf for use in photosynthesis

B to allow carbon dioxide produced by photosynthesis to leave the leaf

C to allow oxygen from the air to enter the leaf for use in photosynthesis

D to allow oxygen from the water to enter the leaf for respiration

36 Which term is used when humans cross individuals with desirable features?

A genetic breeding

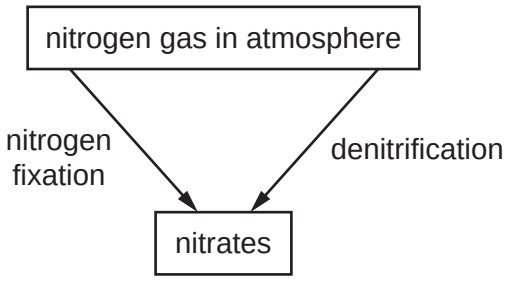
B natural breeding

C pure-breeding

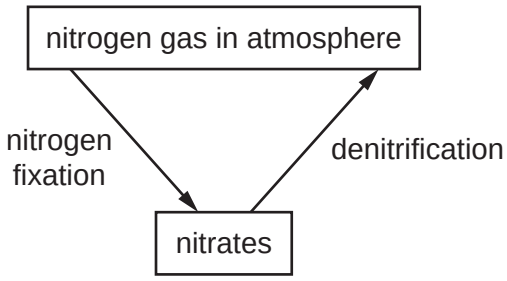
D selective breeding

37 Which diagram shows part of the nitrogen cycle?

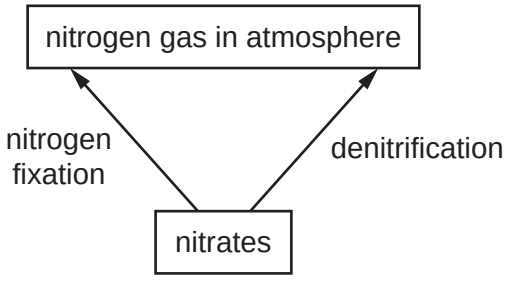
A



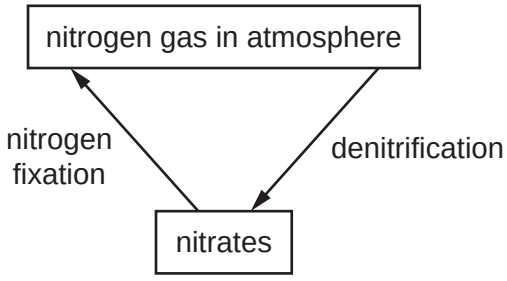
B



C



D



38 What is an advantage of growing crops as a large-scale monoculture?

A Biodiversity is increased.

B Genetic variation is increased.

C Water use is increased.

D Yield of the crop is increased.

39 Yeast can produce carbon dioxide and ethanol.

What can be made using these products?

	carbon dioxide	ethanol
A	biofuel	washing powder
B	washing powder	fruit juice
C	fruit juice	bread
D	bread	biofuel

40 Bacteria can be genetically modified to produce a human protein.

What is the first step in this process?

A insertion of human DNA into bacterial plasmid DNA

B insertion of recombinant plasmids into bacteria

C isolation of the DNA making up the human gene

D expression of the human gene in bacteria