Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/23**

Paper 2 Multiple Choice (Extended) **October/November 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. Any blank pages are indicated.

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1 What is a description of excretion?

A a chemical reaction that releases energy

B a permanent increase in size and dry mass

C removal of waste products of metabolism

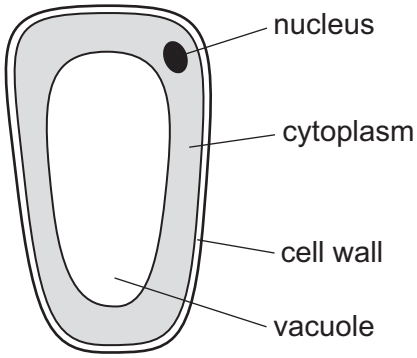
D taking in materials for energy, growth and development

2 The scientific name for a domestic horse is *Equus caballus*.

Which row shows the two parts of the name using the binomial system?

	Equus	*caballus*
A	kingdom	species
B	species	genus
C	genus	kingdom
D	genus	species

3 The diagram shows a type of plant cell.



Where does this type of cell come from?

A root

B cuticle

C palisade mesophyll

D spongy mesophyll

4 What is the formula for calculating magnification?

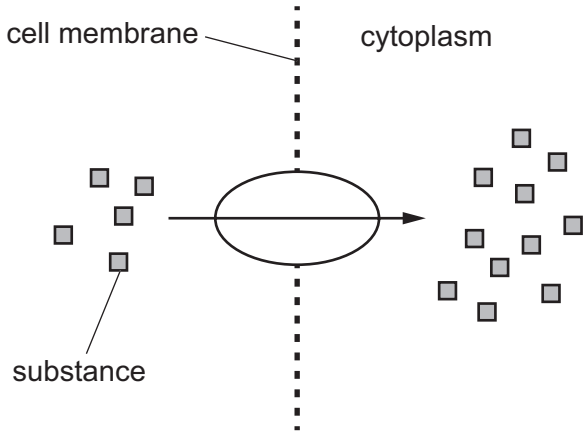
A $\frac{\text{actual size}}{\text{image size}}$

B actual size × image size

C $\frac{\text{image size}}{\text{actual size}}$

D image size × actual size

5 The diagram represents a substance moving across a cell membrane, using energy from respiration.



Which method of transport does the diagram represent?

A active transport

B diffusion

C evaporation

D osmosis

6 Which food-testing reagent shows a positive result when it turns from blue to purple?

A Benedict's solution

B biuret

C ethanol

D iodine solution

7 What are the characteristics of an enzyme?

	the active site is the same shape as the substrate	it is used up during the reaction	it is made of protein
A	no	no	yes
B	no	yes	no
C	yes	yes	no
D	yes	no	yes

8 An enzyme in potato cells causes oxygen to be produced from the breakdown of hydrogen peroxide.

Cubes of potato tissue were placed in a hydrogen peroxide solution at different temperatures.

The number of bubbles of oxygen released per minute was counted at each temperature.

The table shows the results.

temperature / °C	15	25	35	45	55
number of bubbles of oxygen released per minute	96	98	82	36	1

The results suggest the optimum temperature for the enzyme is between which two values?

A 15 °C and 35 °C

B 35 °C and 45 °C

C 35 °C and 55 °C

D 45 °C and 55 °C

9 Which molecules contain nitrogen?

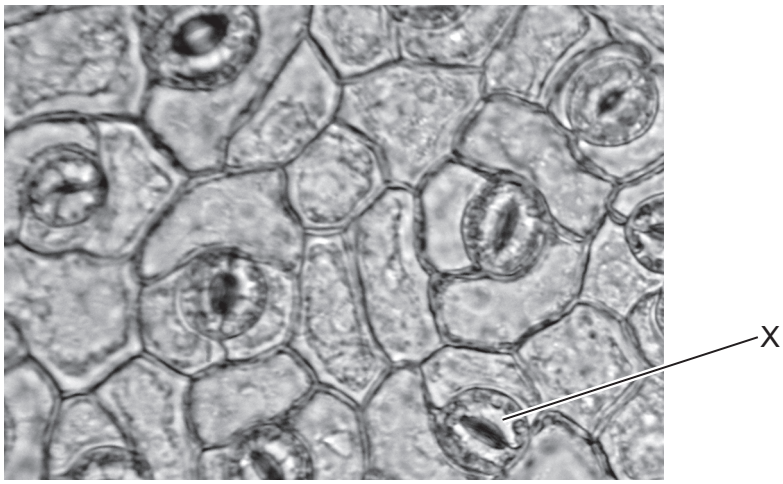
A amino acids

B fats

C glucose

D starch

10 The photomicrograph shows the lower surface of a leaf.



Which part of the leaf is labelled X?

A guard cell

B palisade cell

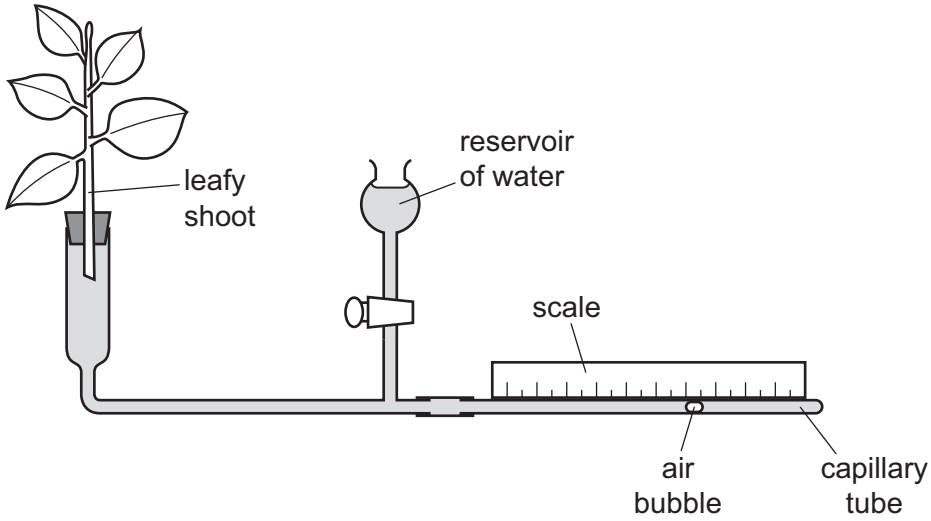
C stoma

D xylem vessel

11 Which row shows the correct enzyme, its substrate and the site of enzyme action in the alimentary canal?

	enzyme	substrate	site of enzyme action
A	amylase	starch	colon
B	lipase	fatty acid	duodenum
C	maltase	maltose	ileum epithelium
D	trypsin	protein	stomach

12 A student set up the experiment shown in the diagram on a hot and dry day. The air bubble moved towards the leafy shoot by 30 mm in 1 hour.



The student was asked to predict and explain the result that would have been obtained on a hot and humid day.

Which row is correct?

	distance moved / mm	explanation
A	15	water evaporates more quickly in humid air
B	15	water evaporates more slowly in humid air
C	45	water evaporates more quickly in humid air
D	45	water evaporates more slowly in humid air

13 Which statement describes the process of translocation?

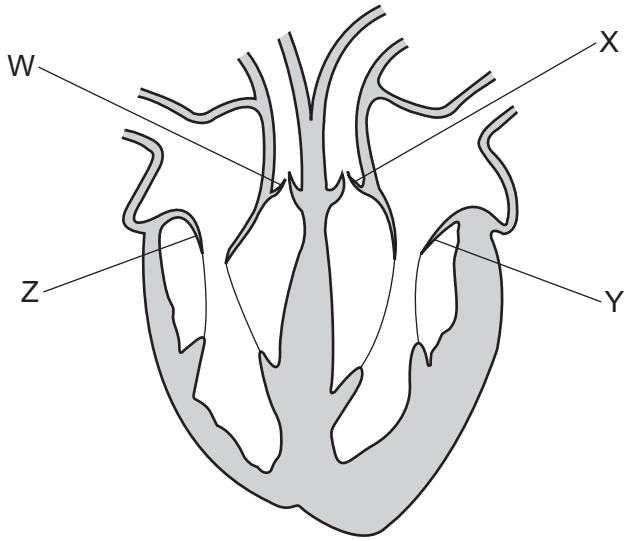
A the movement of sucrose and amino acids in the xylem from the source to the sink

B the movement of sucrose and water in the phloem from the sink to the source

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

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

14 The diagram shows the human heart.



What are the semilunar valves?

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

15 Which component of the blood transports hormones?

A plasma

B platelets

C red blood cells

D white blood cells

16 During the process of vaccination, what stimulates an immune response?

A antibodies

B antigens

C lymphocytes

D phagocytes

17 Muscles are responsible for the ventilation of the lungs during breathing.

Which row describes their action during the inspiration of air?

	diaphragm muscles	external intercostal muscles	internal intercostal muscles
A	contract	contract	relax
B	contract	relax	contract
C	relax	contract	relax
D	relax	relax	contract

18 Which molecule is a product of anaerobic respiration in yeast?

A C_2H_5OH **B** $C_6H_{12}O_6$ **C** H_2O **D** O_2

19 In a kidney nephron, which substances are filtered out of the blood in the glomerulus?

A glucose, protein, ions and water

B glucose, protein, urea and water

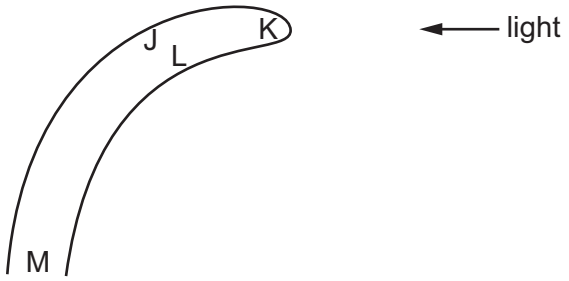
C glucose, ions, urea and water

D ions, urea and water only

20 How many types of cone cells are there in the human eye?

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

21 The diagram shows a plant shoot growing towards the light.



Which row describes where auxin is produced, and which side of the shoot has the **lowest** concentration of auxin?

	where auxin is produced	the side of the shoot with the **lowest** auxin concentration
A	K	J
B	K	L
C	M	J
D	M	L

22 Which statement about antibiotics is correct?

A Antibiotics are produced by memory cells.

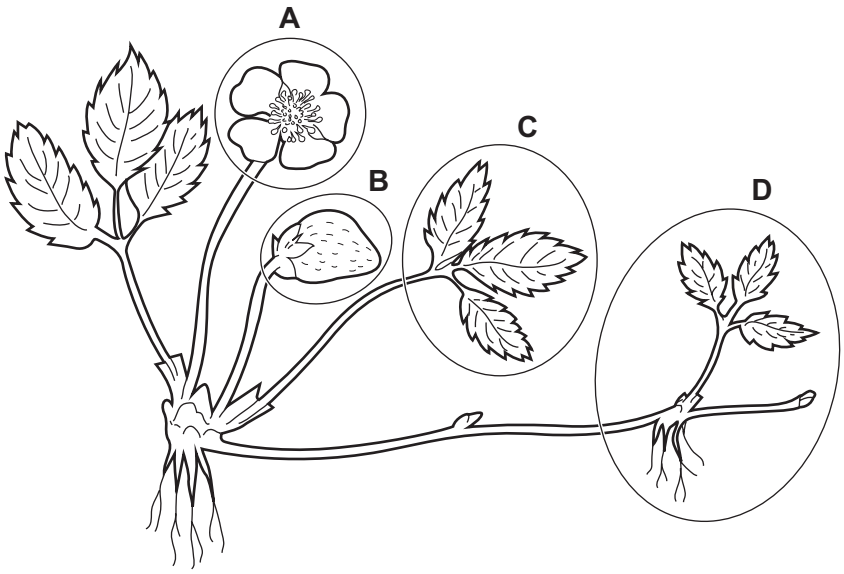
B Antibiotics are used to treat rickets.

C Antibiotics are used to treat viral infections.

D Antibiotics should only be used when essential.

23 The diagram shows a strawberry plant.

Which labelled part of the plant can only be produced by asexual reproduction?



24 Which part of a flower can contain a pollen tube?

A anther

B filament

C stamen

D style

25 To avoid extinction of rare plant species, a botanical garden keeps a collection of seeds known as a seed bank.

Which condition will prevent these seeds germinating while they are in storage?

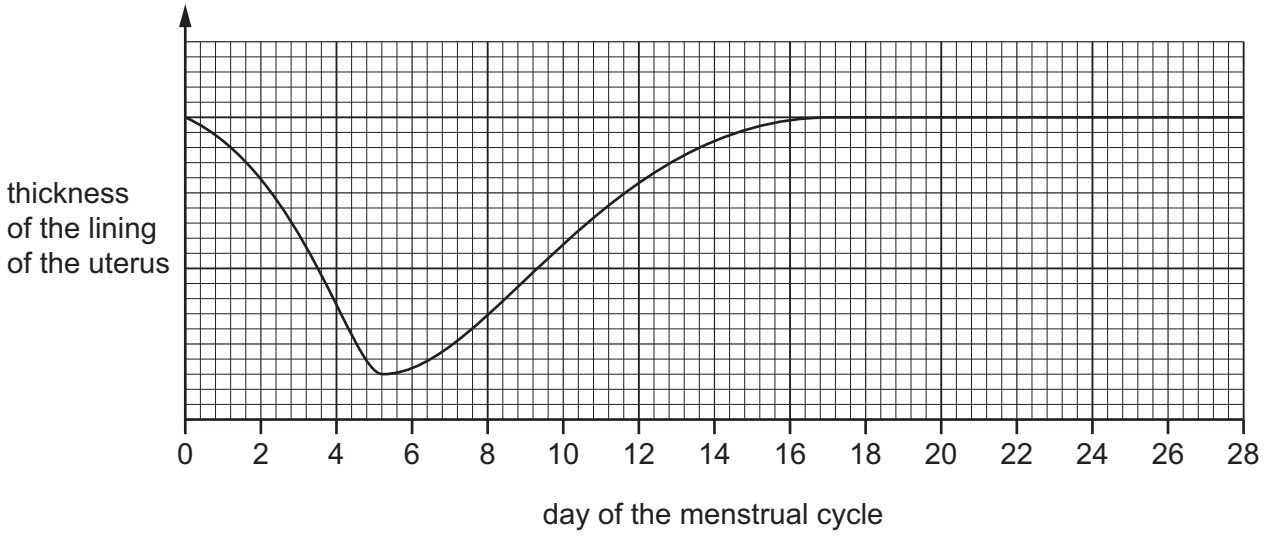
A high humidity

B high oxygen levels

C low light intensity

D low temperature

26 The graph shows the changes to the thickness of the lining of the uterus during the menstrual cycle.



Which hormone is responsible for the change to the thickness of the lining of the uterus shown between days 5 and 16?

A FSH

B LH

C oestrogen

D progesterone

27 Which hormone concentrations are high during pregnancy?

	LH	oestrogen	progesterone
A	no	no	yes
B	yes	no	no
C	no	yes	yes
D	yes	yes	no

28 By which route would an HIV infection **not** be transmissible?

A blood

B saliva

C sharing needles for injections

D semen

29 Which description of a human gamete is correct?

A a diploid cell with 23 chromosomes

B a diploid cell with 46 chromosomes

C a haploid cell with 23 chromosomes

D a haploid cell with 46 chromosomes

30 Which statements about meiosis are correct?

	produces genetically identical cells	involved in the production of gametes
A	yes	no
B	yes	yes
C	no	yes
D	no	no

31 A female parent who is heterozygous for red-green colour blindness has a female child with a red-green colour-blind male parent.

What is the chance of the female child being colour-blind?

A 0% **B** 25% **C** 50% **D** 100%

32 A pure-breeding plant with smooth stems was crossed with a heterozygous plant with hairy stems.

What will be the ratio of hairy to smooth stems in the resulting plants?

A 1 hairy : 1 smooth

B 1 hairy : 3 smooth

C 3 hairy : 1 smooth

D all hairy

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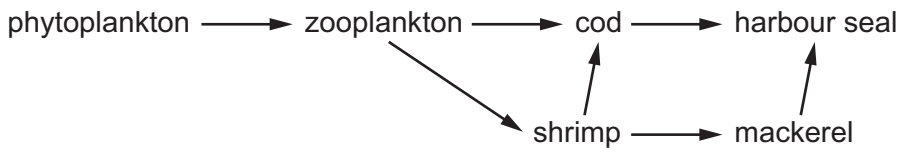
33 Which row shows the adaptive features of a xerophyte?

	deep roots	leaves with small surface area	many stomata on leaves	thin leaf cuticle
A	yes	yes	no	no
B	yes	no	yes	no
C	no	yes	no	yes
D	no	no	yes	yes

34 The diagram shows a marine food web.



At which trophic levels is the cod found?

A primary consumer and secondary consumer

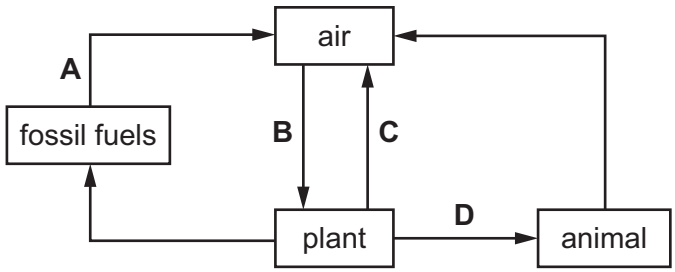
B secondary consumer and tertiary consumer

C secondary consumer only

D tertiary consumer only

35 The diagram shows part of the carbon cycle.

Which labelled arrow would have the balanced chemical equation
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$?



36 Which statement explains why there is a lag phase in a population graph?

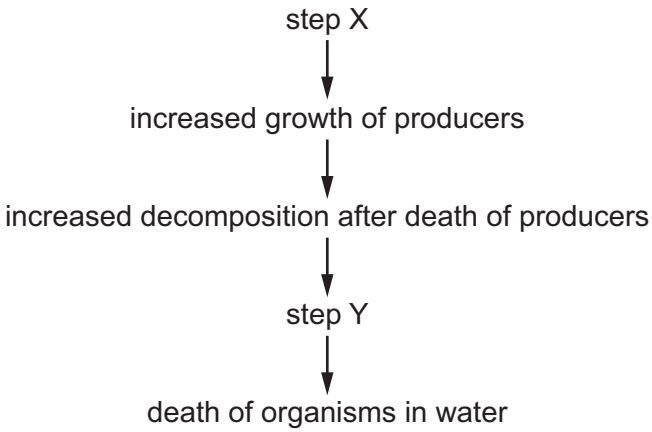
A The build-up of waste products limits population growth.

B The low population size limits the birth rate.

C The number of births is equal to the number of deaths.

D The number of deaths is greater than the number of births.

37 The flow chart describes the process of eutrophication.



What should be at step X and step Y in the flow chart?

	step X	step Y
A	decrease in nitrate ion concentration	decreased dissolved oxygen concentration
B	increase in nitrate ion concentration	decreased dissolved oxygen concentration
C	decrease in nitrate ion concentration	increased dissolved oxygen concentration
D	increase in nitrate ion concentration	increased dissolved oxygen concentration

38 How can fish stocks be conserved?

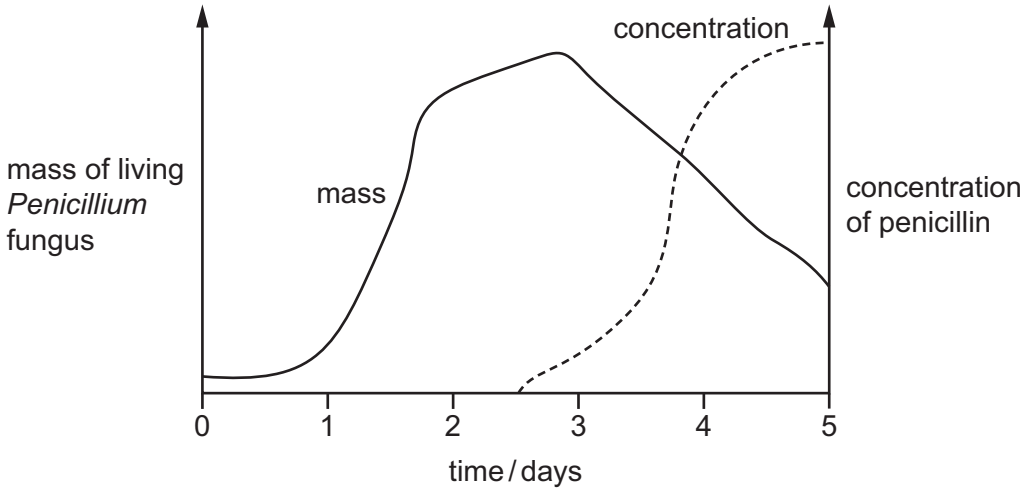
A closed seasons

B decreased mesh size

C increased quotas

D reduction in protected areas

39 Penicillin is produced in a fermenter by growing the fungus *Penicillium*. The graph shows how the mass of living *Penicillium* fungus and the concentration of penicillin change over time.



When is the best time to collect the penicillin?

A at 1.5 days

B at 3.0 days

C at 3.5 days

D at 5.0 days

40 Which enzymes are required to produce human proteins, using genetic modification?

	to cut the bacterial plasmid DNA	to form a recombinant plasmid	to isolate the DNA making up the human gene
A	DNA ligase	restriction enzymes	DNA ligase
B	DNA ligase	restriction enzymes	restriction enzymes
C	restriction enzymes	DNA ligase	restriction enzymes
D	restriction enzymes	DNA ligase	DNA ligase

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