Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/23**

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.

IB22 06_0610_23/5RP

[Turn over

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

What is the name of this characteristic?

A growth

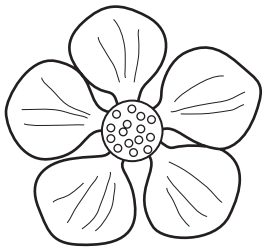
B nutrition

C respiration

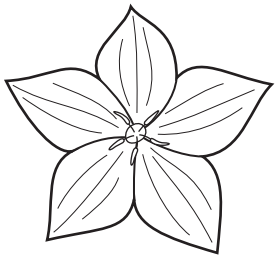
D sensitivity

2 Which diagram shows a flower from a monocotyledon?

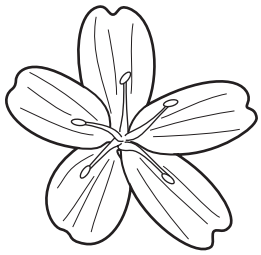
A



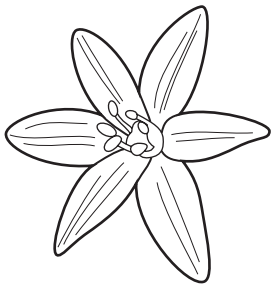
B



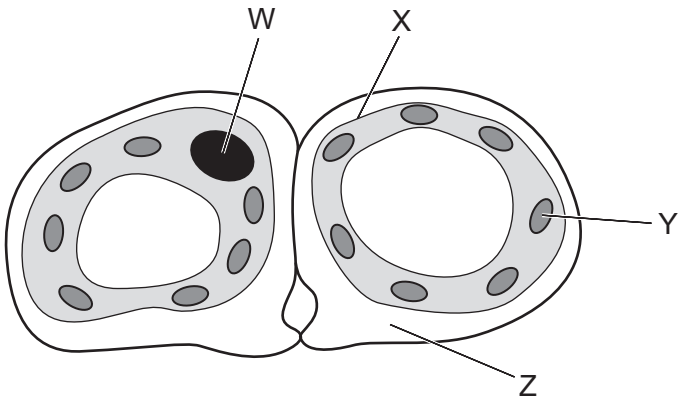
C



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 Which level of organisation is shown by the heart of a mammal?

A a cell

B a tissue

C an organ

D an organ system

5 Female moths release chemicals into the air. Male moths detect these chemicals and fly towards the females.

How do the chemicals spread through the air?

A active transport

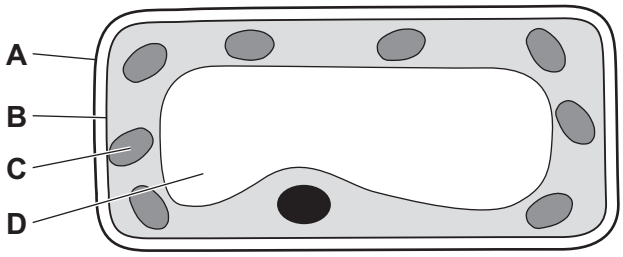
B diffusion

C osmosis

D transpiration

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 DNA is made up of .....1..... strands coiled together. The strands contain chemicals called .....2..... . These chemicals form .....3..... , A pairing with T and C pairing with G.

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	three	amino acids	cross-links
B	two	bases	cross-links
C	three	bases	proteins
D	two	amino acids	proteins

[Turn over

9 What is the correct definition of an enzyme?

A a carbohydrate that functions as a biological catalyst

B a protein that functions as a biological catalyst

C a substance that is changed by the reaction

D a substance made of fats that changes the rate of a reaction

10 Which statement describes the effect of temperature on enzymes?

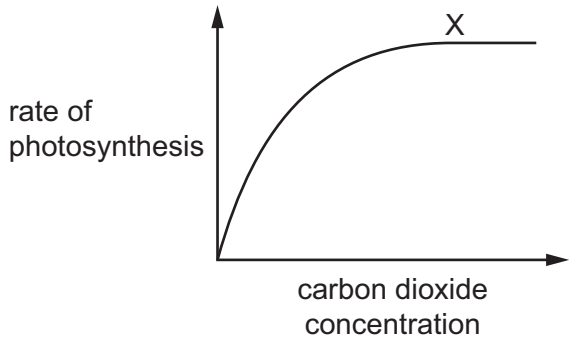
A High temperatures denature enzymes making it difficult for substrate molecules to fit into the active site.

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.

11 The graph shows the rate of photosynthesis at different carbon dioxide concentrations.



What could be the limiting factor of photosynthesis at X on the graph?

A oxygen

B carbon dioxide

C glucose

D light intensity

12 The list shows features of a plant leaf.

1 air spaces between spongy mesophyll cells

2 chloroplasts in mesophyll cells

3 contains a natural insecticide

4 xylem vessels close to mesophyll cells

Which features are adaptations for photosynthesis?

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

13 Which nutrient is required to prevent scurvy?

A calcium

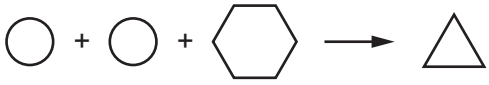
B iron

C vitamin C

D vitamin D

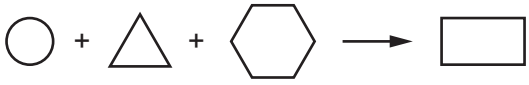
14 Which diagram represents the action of lipase?

A

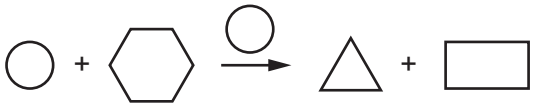


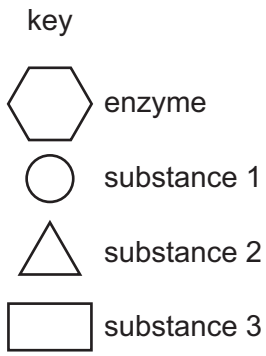
B

C



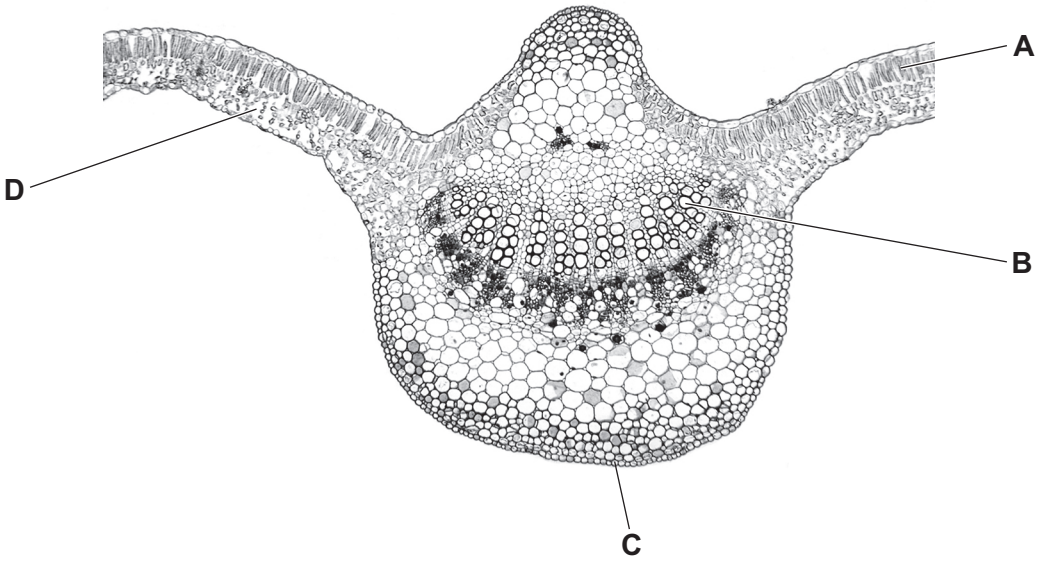
D





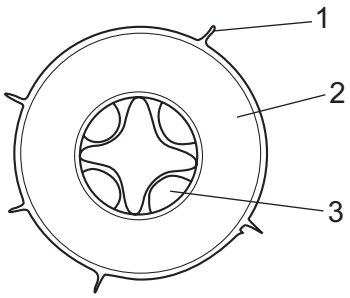
15 The image shows a cross-section of part of a leaf.

Which labelled structure is the xylem?



16 The diagram shows a cross-section of a root.

Three regions of the root are numbered.



Which regions contain cells through which water must pass to reach the xylem?

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

17 In a double circulation, what is the role of the right side of the heart?

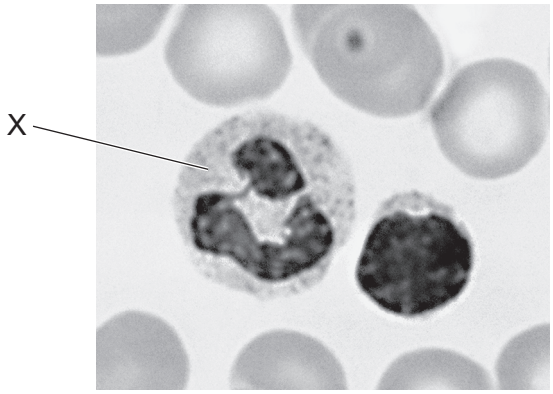
A to receive oxygenated blood from the body and to pump oxygenated blood to the lungs

B to receive oxygenated blood from the body and to pump deoxygenated blood to the lungs

C to receive deoxygenated blood from the body and to pump oxygenated blood to the lungs

D to receive deoxygenated blood from the body and to pump deoxygenated blood to the lungs

18 The photomicrograph shows some human blood cells.



What is the name of cell X and what is its function?

	name	function
A	lymphocyte	produces antibodies
B	lymphocyte	engulfs pathogens
C	phagocyte	produces antibodies
D	phagocyte	engulfs pathogens

19 Three statements about immune responses are listed.

1 Antigens trigger an immune response which produces antibodies.

2 Memory cells are produced.

3 Antibodies are acquired from another individual.

Which statements are correct when describing active immunity?

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

20 Which row shows the action of muscles during inspiration?

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

[Turn over

21 Carbon dioxide is produced by aerobic respiration.

How many molecules of carbon dioxide are produced from the aerobic respiration of three molecules of glucose?

A 3 **B** 6 **C** 12 **D** 18

22 Which statements describe how an oxygen debt is removed after vigorous exercise?

1 Lactic acid is transported to the liver.

2 Lactic acid is respired aerobically.

3 Heart rate stays high to remove lactic acid from the muscles.

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

23 Which statement about urea is correct?

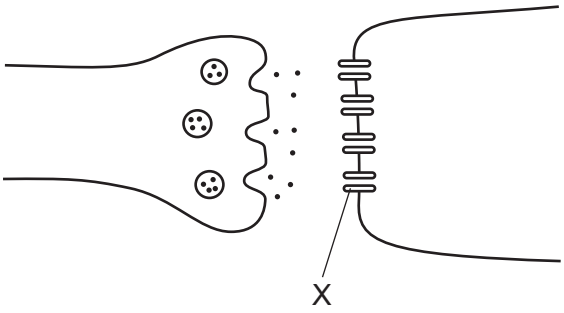
A Amino acids are transported to the kidneys where they are converted to urea.

B Urea travels from liver cells to the kidneys where it is filtered out of the blood.

C Liver cells break down proteins to amino acids which are then converted to urea in the kidneys.

D Urea is made in the kidneys and then removed from the body by the liver.

24 The diagram shows the junction between two neurones.



What is labelled at X?

A neurotransmitter

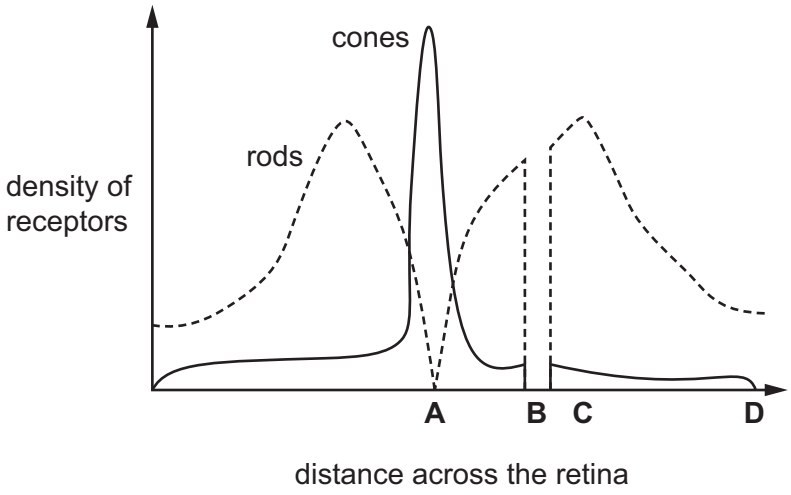
B vesicle

C neurotransmitter receptor molecule

D synaptic cleft

25 The diagram shows the density of rods and cones across a section of the retina.

What is the position of the fovea?



26 What is the synthetic plant hormone 2,4-D used for?

A genetic engineering

B inhibiting phototropism

C killing weeds

D promoting germination

27 Which statement about asexual reproduction would be a disadvantage for a farmer growing crop plants?

A Desirable qualities are shown throughout the crop.

B No pollinators are required.

C Only one parent plant is required so growth is rapid.

D All of the crop plants have the same risk of disease.

28 The diagram shows an abnormal sperm cell.

Why would the abnormal sperm cell be unable to fertilise an egg?

A It has no acrosome so is unable to digest the jelly coat of the egg.

B It has no mitochondria so lacks energy to swim to the egg.

C It has no flagellum so cannot swim to the egg.

D It has no nucleus so cannot fuse with the egg.

[Turn over

29 One type of contraceptive pill contains progesterone and oestrogen. Some effects of the pill are listed.

1 inhibit FSH production

2 inhibit LH production

3 inhibit thickening of the uterus wall

Which prevent the development and the release of an egg cell?

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

30 Some fruit flies have orange eyes and others have red eyes.

If two orange-eyed fruit flies are crossed, their offspring always have orange eyes.

If two red-eyed fruit flies are crossed, their offspring can have orange eyes or red eyes.

What can be concluded from these observations?

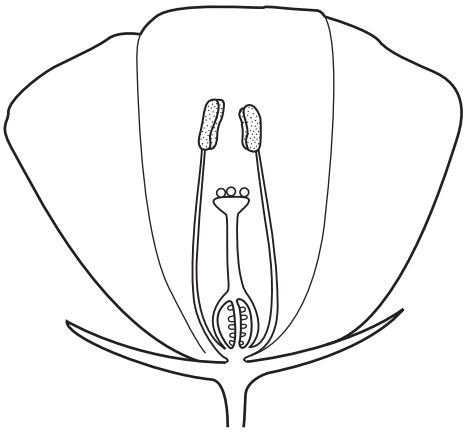
A The allele for orange eyes is dominant.

B The allele for orange eyes is recessive.

C The alleles for orange and red eyes are codominant.

D This is an example of sex linkage.

31 The diagram shows a section of a flower that has been cross-pollinated.



Which statements about this flower are correct?

1 The pollen produced by this flower will be genetically different from the pollen on the stigma.

2 The pollen was carried to the stigma by wind.

3 This flower is insect-pollinated because the stigma is enclosed by the petals.

4 The pollen was produced by another flower on the same plant.

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

32 A woman with normal colour vision is a carrier for the colour blindness allele (X^BX^b). She has a male child with a man who has normal colour vision (X^BY).

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

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

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 What is the name of an organism that obtains its energy from dead organic material?

A carnivore

B consumer

C decomposer

D herbivore

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

[Turn over

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?

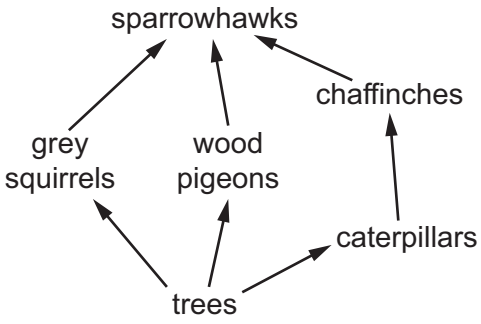
A to absorb oxygen from the air

B to decrease rainfall

C to obtain drugs for medicinal use

D to release carbon dioxide into the air

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.