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

View solution

What is the name of this characteristic?

**A** growth

**B** nutrition

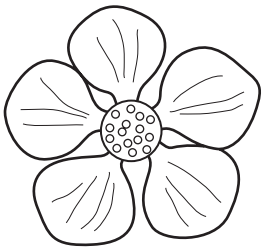
**C** respiration

**D** sensitivity

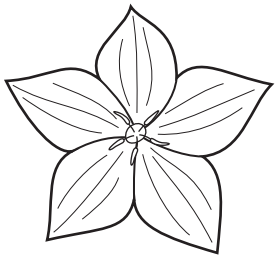
**2** Which diagram shows a flower from a monocotyledon?

View solution

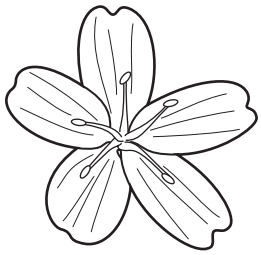
**A**



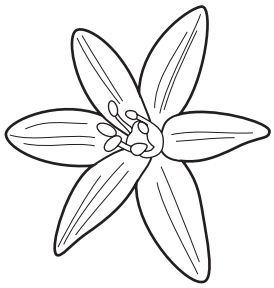
**B**



**C**

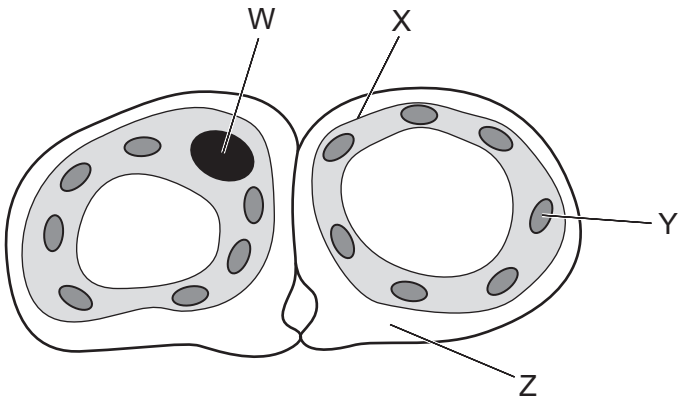


**D**



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

View solution




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?

View solution

**A** a cell

**B** a tissue

**C** an organ

**D** an organ system

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

View solution

How do the chemicals spread through the air?

**A** active transport

**B** diffusion

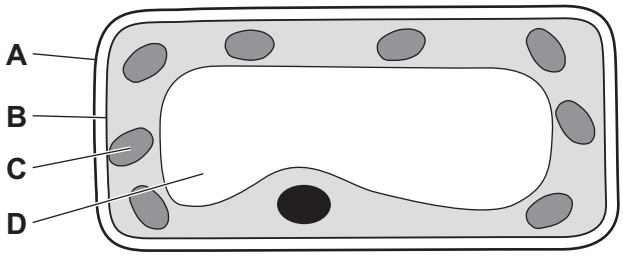
**C** osmosis

**D** transpiration

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

View solution

Which part is partially permeable?




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

View solution

| | 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.

View solution

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 |

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**9** What is the correct definition of an enzyme?

View solution

**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?

View solution

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

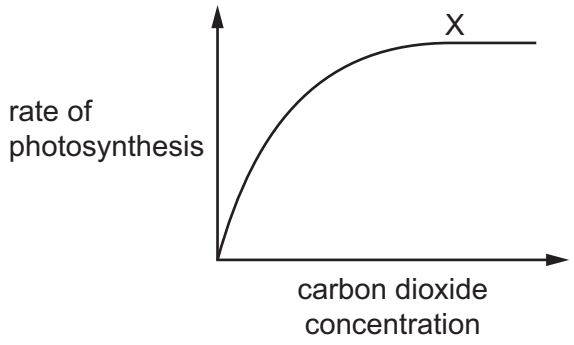
**B** High temperatures denature enzymes making it easy for substrate molecules to fit into the active site.

**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.

View solution




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

**A** oxygen

**B** carbon dioxide

**C** glucose

**D** light intensity

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**12** The list shows features of a plant leaf.

View solution

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?

View solution

**A** calcium

**B** iron

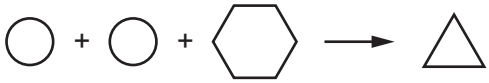
**C** vitamin C

**D** vitamin D

**14** Which diagram represents the action of lipase?

View solution

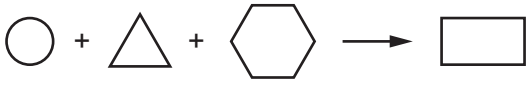
**A**



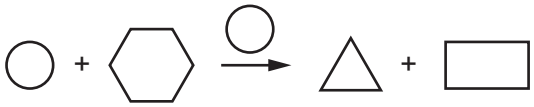
**B**

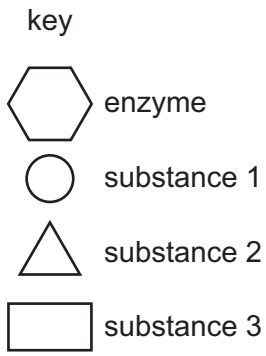


**C**



**D**

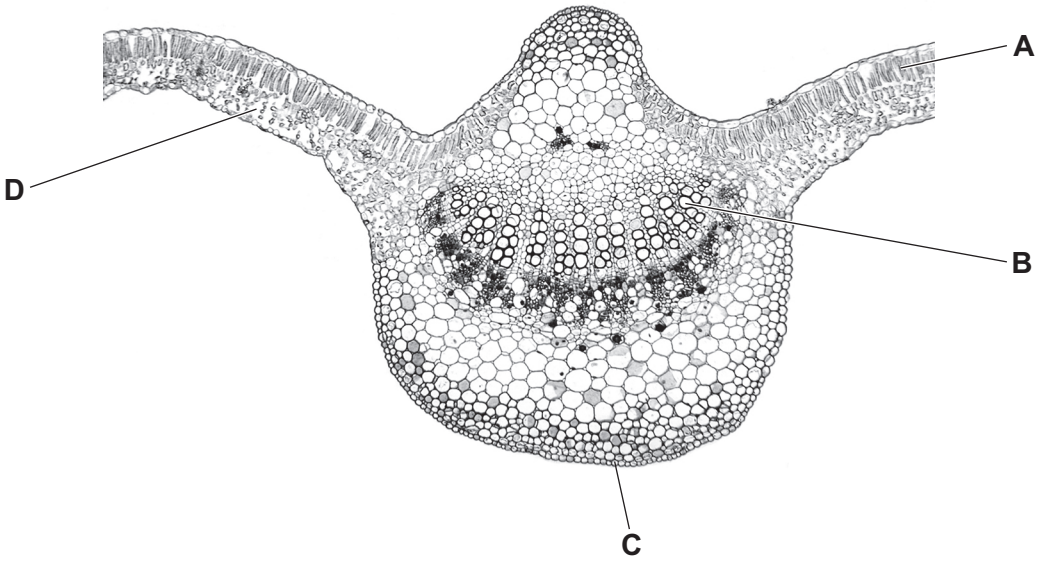




**15** The image shows a cross-section of part of a leaf.

View solution

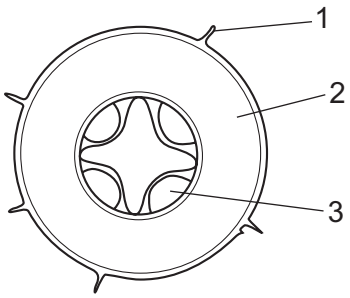
Which labelled structure is the xylem?




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

View solution

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?

View solution

**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

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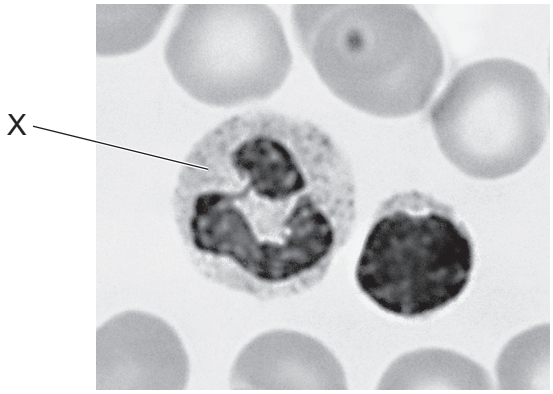
**18** The photomicrograph shows some human blood cells.

View solution




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.

View solution

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?

View solution

| | internal intercostal muscles | external intercostal muscles | diaphragm |
|---|---|---|---|
| **A** | contract | relax | relax |
| **B** | contract | relax | contract |
| **C** | relax | contract | relax |
| **D** | relax | contract | contract |

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**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?

View solution

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

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

View solution

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?

View solution

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

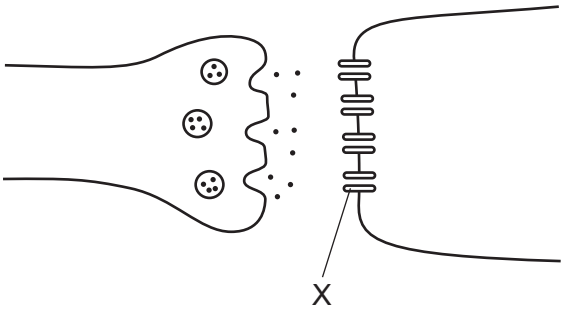
**B** Urea travels from liver cells to the kidneys where it is filtered out of the blood.

**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.

View solution




What is labelled at X?

**A** neurotransmitter

**B** vesicle

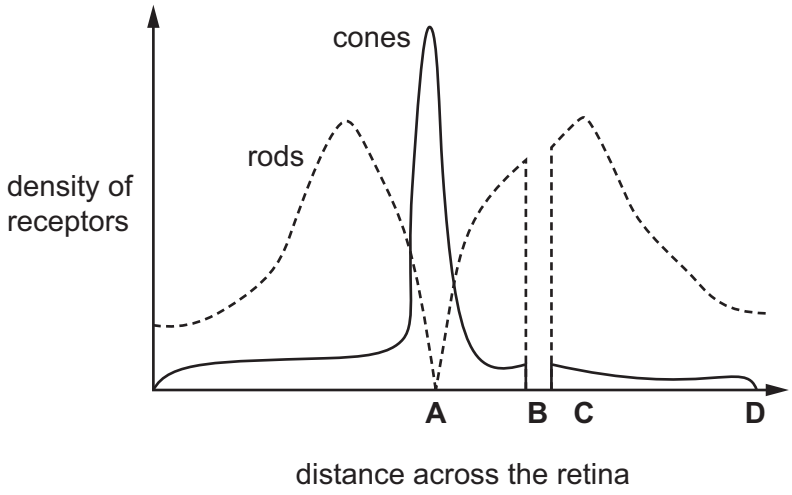
**C** neurotransmitter receptor molecule

**D** synaptic cleft

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

View solution

What is the position of the fovea?




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

View solution

**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?

View solution

**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.

View solution



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.

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

View solution

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.

View solution

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.

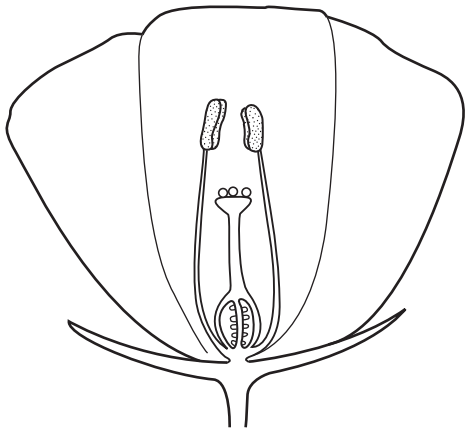
**B** The allele for orange eyes is recessive.

**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.

View solution



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

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**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 ($X^BY$).

View solution

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.

View solution

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?

View solution

**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?

View solution

**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.

View solution

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

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

View solution

**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?

View solution

**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?

View solution

**A** to absorb oxygen from the air

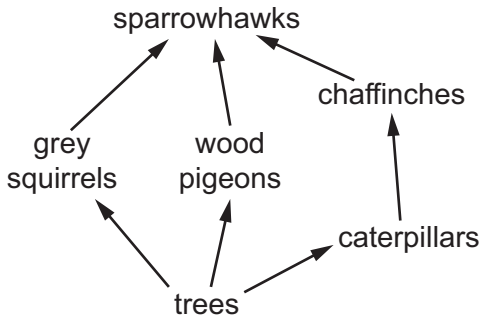
**B** to decrease rainfall

**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.

View solution




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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