Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **October/November 2016**

45 minutes

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

* 8 4 0 2 8 4 7 5 4 7 *

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **14** printed pages and **2** blank pages.

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1 Which characteristic of living organisms is responsible for the production of oxygen in the leaf of a plant exposed to sunlight?

A excretion

B movement

C nutrition

D respiration

2 The scientific name for humans is *Homo sapiens.*

What does *Homo* refer to?

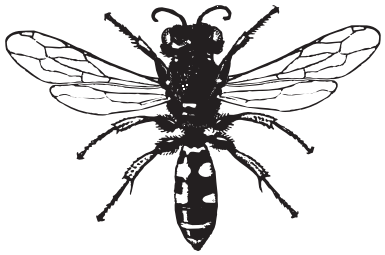
A arthropod

B genus

C kingdom

D species

3 The diagram shows an insect.

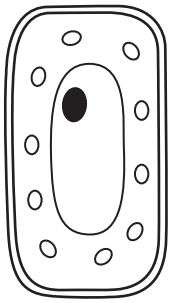


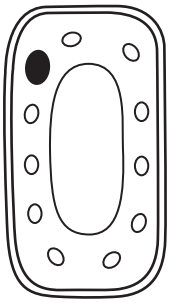
Use the key to identify the insect.

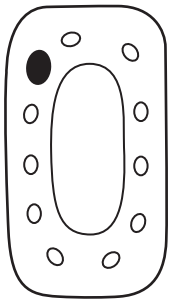
1	wings present	go to 2
	wings absent	**A**
2	two pairs of wings	go to 3
	one pair of wings	**B**
3	wings with circular markings	**C**
	wings without circular markings	**D**

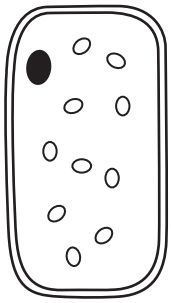
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4 Which diagram represents a typical plant cell?

A 

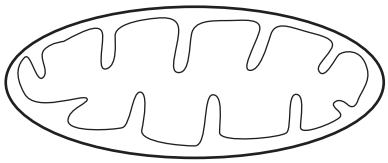
B 

C 

D 

5 A student draws a diagram of a mitochondrion.

The diagram has a magnification of ×20 000.



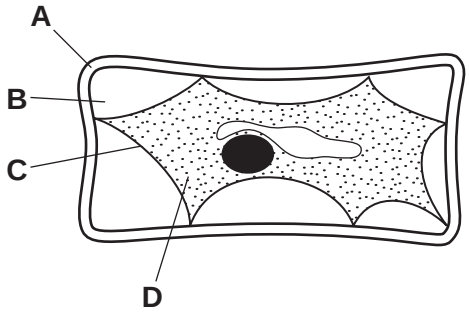
The diagram is 5 cm long.

What is the actual size of the mitochondrion?

A 0.00025 μm **B** 0.0025 μm **C** 0.025 μm **D** 2.5 μm

6 The diagram shows a plant cell which has lost water to its surroundings by osmosis.

Which part is the partially permeable membrane?



7 What would lead to a decrease in diffusion rate into a cell?

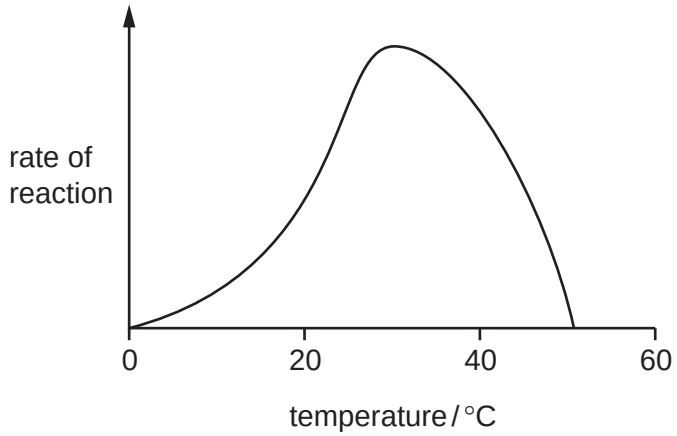
A greater concentration gradient

B higher temperature

C larger surface area of cell

D thicker cell wall

8 The graph shows the effect of temperature on an enzyme-controlled reaction.



Which statement describes the effect of temperature on this reaction?

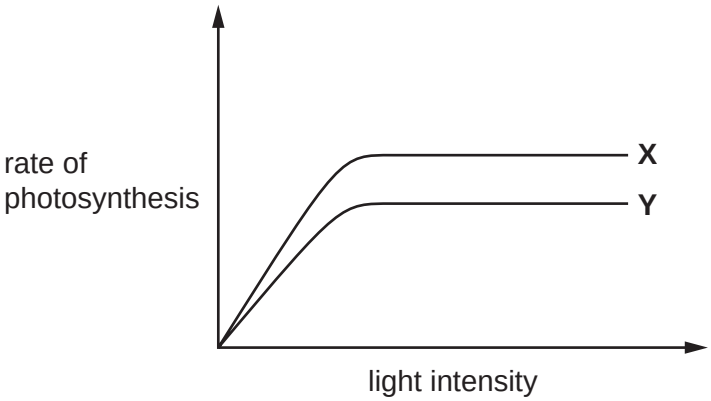
A As the temperature increases to 25 °C the reaction speeds up.

B Between 10 °C and 20 °C the enzyme stops working.

C Between 35 °C and 45 °C the enzyme stops working.

D The optimum temperature for this reaction is 40 °C.

9 Curve **X** on the graph shows the effect of light intensity on the rate of photosynthesis.



How have the conditions changed to produce curve **Y**?

A decreased concentration of carbon dioxide

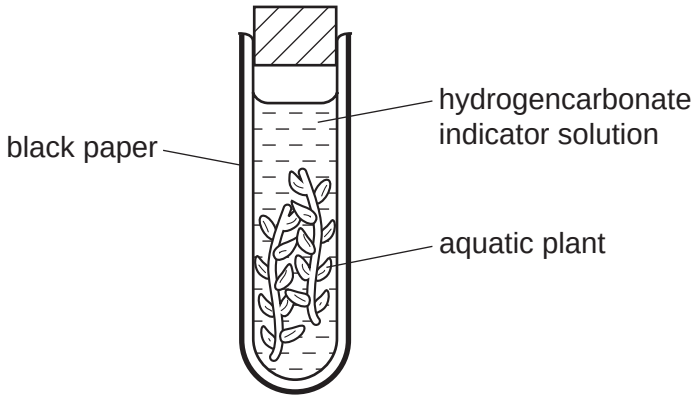
B decreased light intensity

C increased concentration of carbon dioxide

D increased light intensity

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10 An experiment is set up to investigate gas exchange in aquatic plants.



The hydrogencarbonate indicator solution is orange at the start.

Which colour is it after three hours?

A blue-black

B orange

C purple

D yellow

11 The roots of plants take up nitrates from the soil.

What are the nitrates used to make?

A fat

B glucose

C protein

D starch

12 What is the main cause of kwashiorkor?

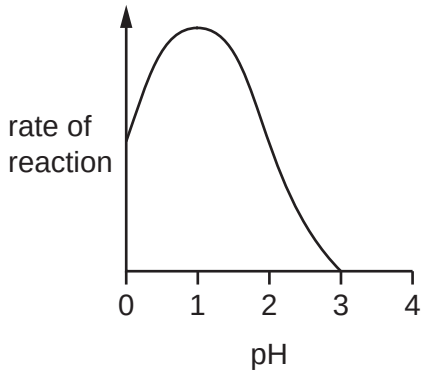
	insufficient energy	insufficient protein
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

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13 What functions are carried out by the small intestine?

	absorption of digested food	absorption of water	ingestion
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✗
D	✗	✗	✓

14 The graph shows the effect of pH on the activity of a human digestive enzyme.



What is the enzyme?

A amylase

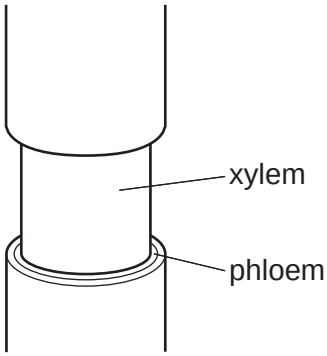
B maltase

C pepsin

D trypsin

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15 The diagram shows the stem of a plant. A strip of the outer tissue including the phloem has been removed.



How is transport in the plant affected?

A Amino acids and sugar cannot pass to the roots.

B Dissolved salts cannot pass to the leaves.

C Water cannot pass to the leaves.

D Water cannot pass to the roots.

16 A plant shoot is placed in a solution of a dye.

The dye moves up the stem.

Under which conditions will the dye move slowest?

	temperature	humidity
A	high	high
B	high	low
C	low	high
D	low	low

17 Which substance is moved by translocation in a flowering plant?

A amino acid

B cellulose

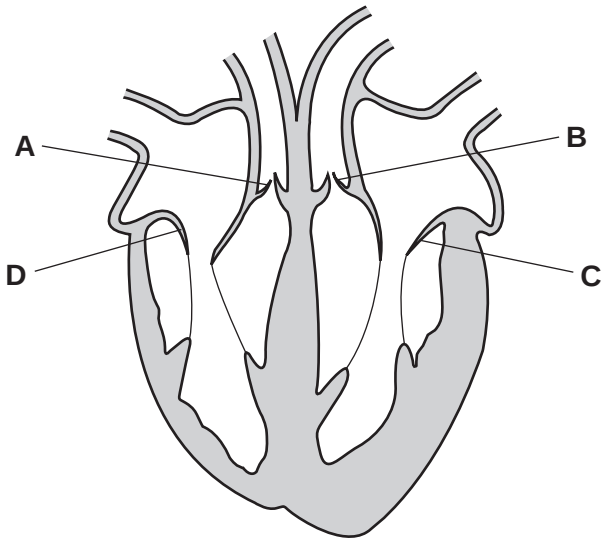
C fat

D starch

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18 The diagram shows a section through the heart.

Which is an atrioventricular valve in the right side of the heart?



19 What is a correct function of the lymphatic system?

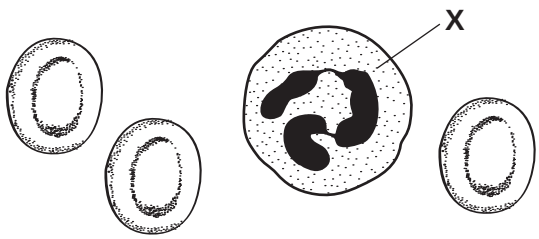
A protects body from heat loss

B protects body from infection

C transports blood to lymph nodes

D transports urea to the kidneys

20 The diagram shows human blood cells, as seen under a microscope.



What is the function of cell **X**?

A to carry glucose

B to carry oxygen

C to defend against disease

D to make the blood clot

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21 Which change occurs during blood clotting?

A fibrinogen to fibrin

B glucose to glycogen

C haemoglobin to oxyhaemoglobin

D maltose to glucose

22 How does passive immunity differ from active immunity? In passive immunity

A antibodies are produced by lymphocytes.

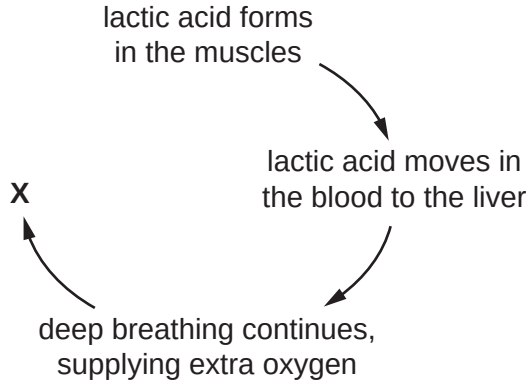
B immunity depends on vaccination.

C immunity is specific to one type of antigen.

D no memory cells are produced.

23 After a race, athletes experience oxygen debt.

The diagram shows how the oxygen debt is removed.



What happens at **X**?

A aerobic respiration of glucose

B aerobic respiration of lactic acid

C anaerobic respiration of glucose

D anaerobic respiration of lactic acid

24 What is the equation for anaerobic respiration in yeast?

A $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

B $C_6H_{12}O_6 \rightarrow 2C_3H_6O_3$

C $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

D $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

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25 In a kidney tubule, which substances are filtered out of the blood in the glomerulus?

A glucose, protein, salts and water

B glucose, protein, urea and water

C glucose, salts, urea and water

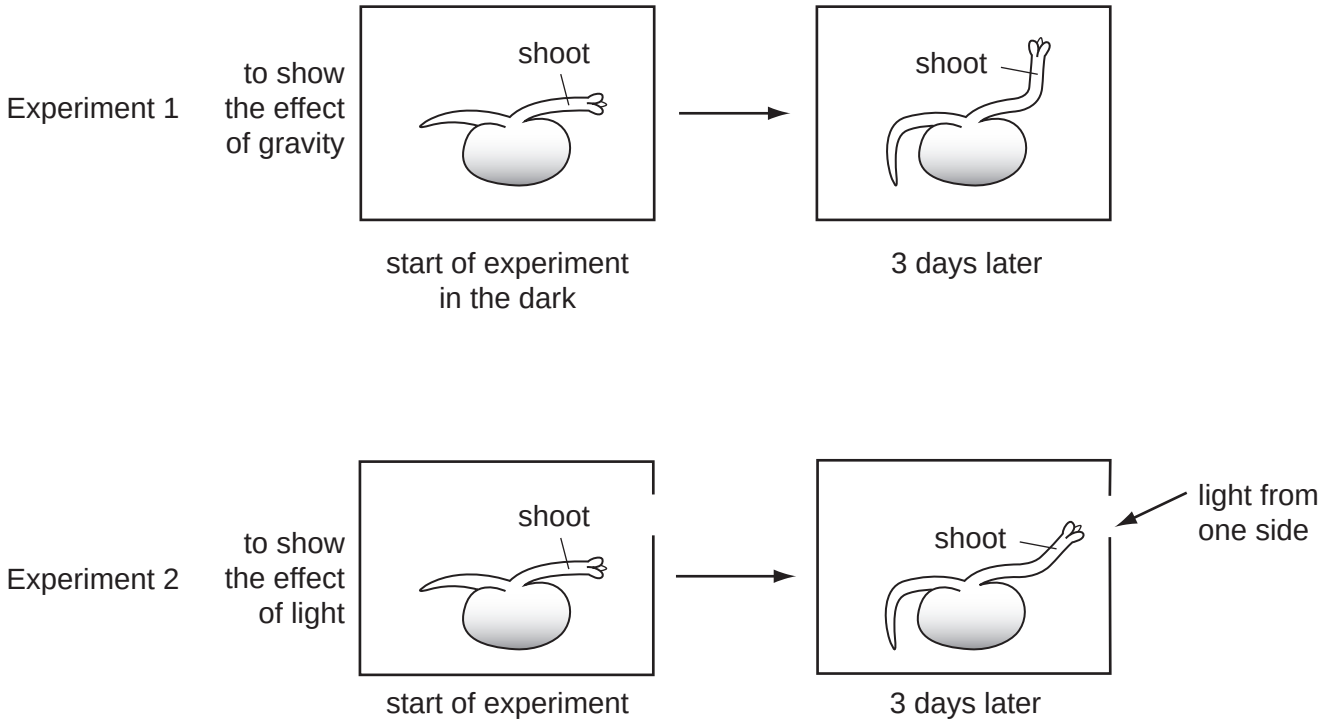
D protein, salts, urea and water

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

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27 The diagram shows seedlings in two experiments on the tropic response of seedlings to gravity and light.



How have the seedlings responded?

	to gravity	to light
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = tropic response shown

✗ = no tropic response shown

28 When does fertilisation occur in humans?

A when an egg is released

B when implantation occurs

C when sperm and egg nuclei fuse

D when sperm are released

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[Turn over

29 What describes the nuclei in human reproduction?

	egg	sperm	zygote
A	diploid	diploid	diploid
B	diploid	diploid	haploid
C	haploid	haploid	diploid
D	haploid	haploid	haploid

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

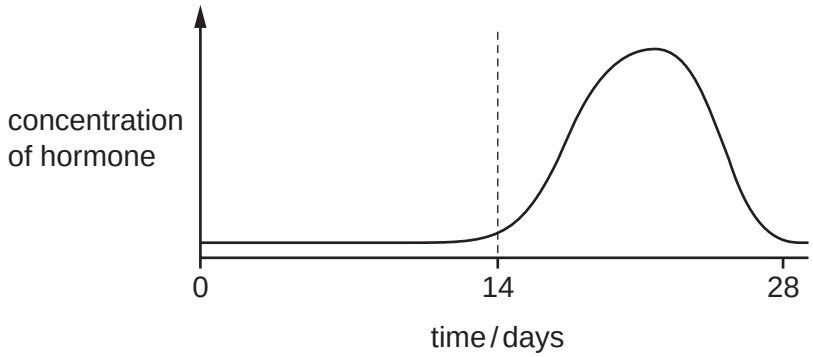
A acrosome

B flagellum

C mitochondria

D nucleus

31 The graph shows a hormone that is involved in controlling the human female menstrual cycle.



Which hormone is shown by the curve?

A FSH

B LH

C oestrogen

D progesterone

32 Which combination of chromosomes from egg and sperm cells will produce a boy?

	egg	sperm
A	X	X
B	X	Y
C	Y	X
D	Y	Y

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33 What happens in meiosis?

	genetically identical cells produced	chromosome number is halved
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

34 What is the inheritance of colour blindness an example of?

A co-dominance

B continuous variation

C reduction division

D sex linkage

35 The phenotype of an organism is its

A combination of alleles.

B family pedigree.

C genetic make-up.

D observable features.

36 Which is an adaptive feature of hydrophytes?

A large network of roots

B leaves covered with spines

C stomata on the upper surface of the leaves

D water storage in stem

37 Which structures, found in bacteria, make them useful in genetic engineering?

A cell walls

B membranes

C plasmids

D mitochondria

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[Turn over

38 Why is yeast used in bread-making?

A Aerobic respiration produces alcohol.

B Aerobic respiration produces lactic acid.

C Anaerobic respiration produces alcohol.

D Anaerobic respiration produces carbon dioxide.

39 An advantage of some genetically modified crop plants is that they will **not**

A be affected by herbicides.

B need carbon dioxide.

C need magnesium ions.

D need water.

40 When raw sewage is discharged into a stream, what is a result of eutrophication?

A decreased oxygen concentration caused by decreased bacterial activity

B decreased oxygen concentration caused by increased bacterial activity

C increased oxygen concentration caused by decreased bacterial activity

D increased oxygen concentration caused by increased bacterial activity

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