Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **October/November 2020**

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. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.

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1 Which process is carried out by all organisms?

A growth

B photosynthesis

C sexual reproduction

D transpiration

2 What are features of the leaves of a plant that is a dicotyledon?

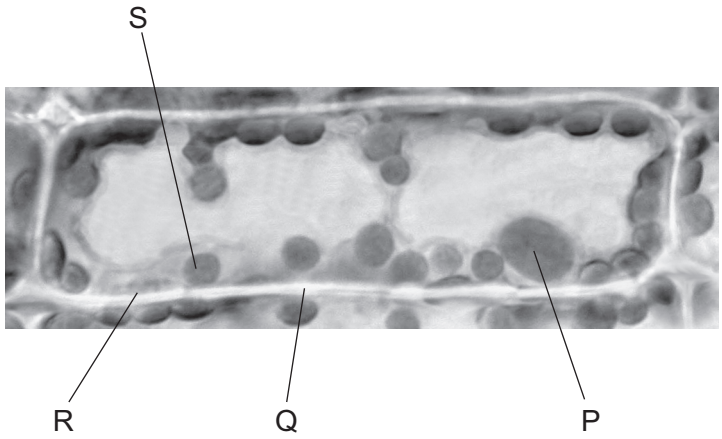
	broad leaves	parallel veins
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

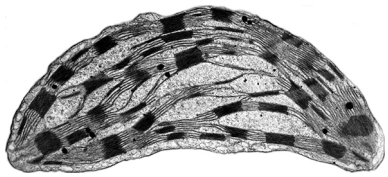
3 The photomicrograph shows a cell from a type of aquatic plant.



Which parts labelled on the photomicrograph indicate that this is a plant cell?

A P and R **B** P and S **C** Q and R **D** Q and S

4 The diagram shows an image of a chloroplast. The image is 5 cm long.



The actual length of the chloroplast is 5 μm.

What is the magnification of the image?

A ×10 **B** ×1000 **C** ×10 000 **D** ×100 000

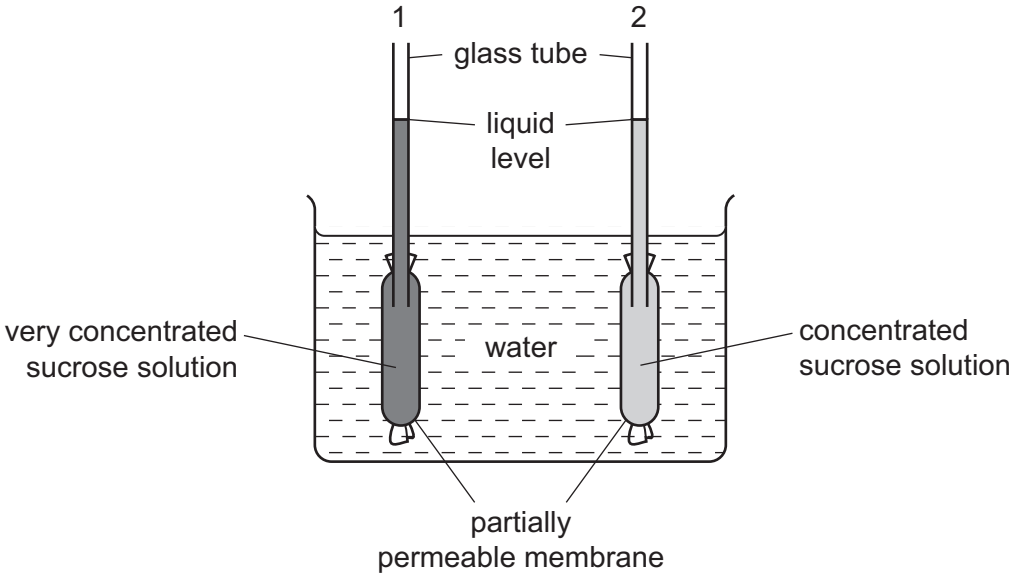
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5 What are features of osmosis?

	diffusion is involved	requires cell walls	requires a partially permeable membrane
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key
✓ = yes
✗ = no

6 The diagram shows apparatus which can be used to demonstrate osmosis.



After one hour, what would happen to the liquid levels in the glass tubes?

	liquid level in tube 1	liquid level in tube 2
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

7 Which substances are made by linking together glucose molecules only?

A cellulose, glycogen and starch

B fats, cellulose and proteins

C proteins, oils and glycogen

D starch, fats and oils

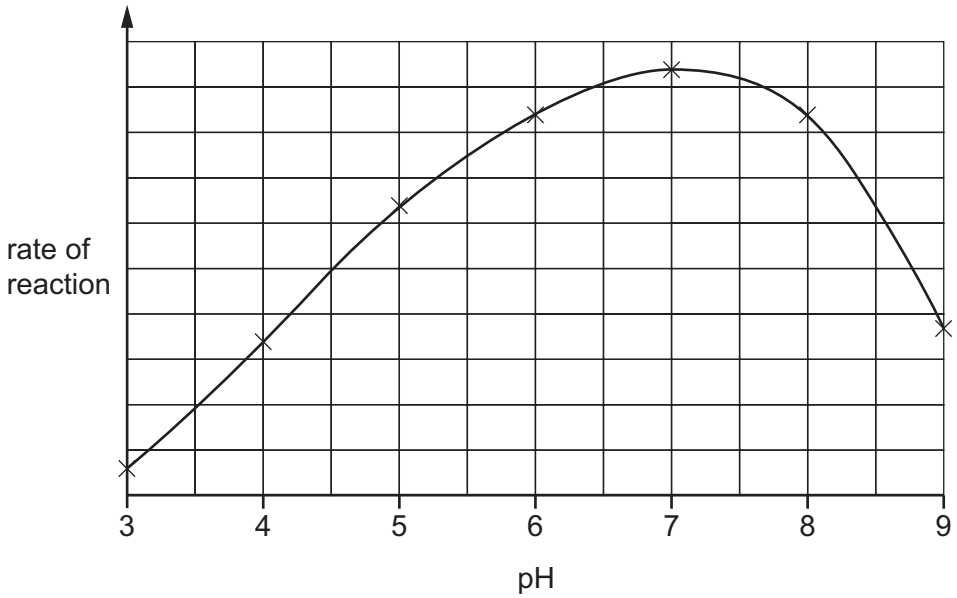
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[Turn over

8 When bases pair up in the formation of DNA, what is one of the pairings?

A G with A **B** G with C **C** G with G **D** G with T

9 The graph shows the effect of pH on the rate of reaction of an enzyme.



What does the graph show?

A The enzyme is destroyed at pH 9.

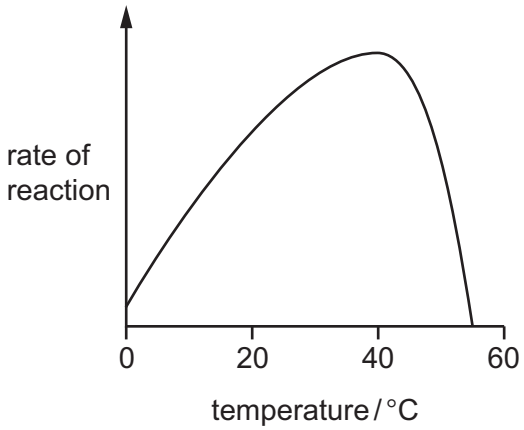
B The enzyme works best at pH 6.

C The rate of reaction halves as the pH changes from pH 5 to pH 7.

D The rate of reaction is the same at pH 5 and pH 8.5.

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10 The graph shows how enzyme activity is affected by temperature.



How can the change in activity between 40 °C and 55 °C be explained?

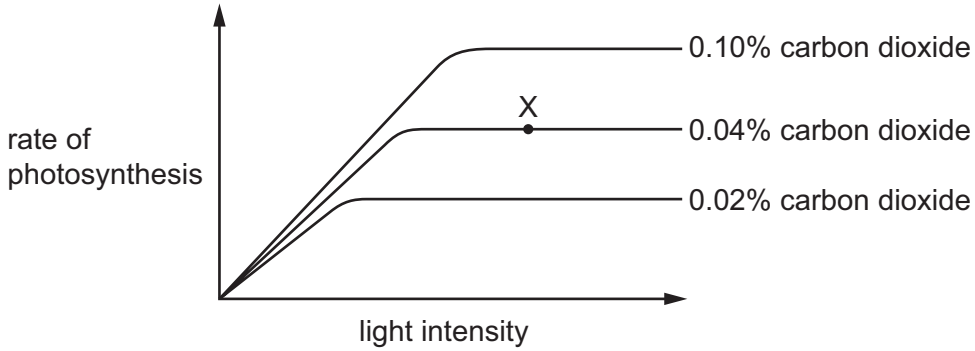
A Heat has killed the enzyme.

B The enzyme has been used up.

C The reactants are moving faster.

D The substrate is less likely to fit into the active site.

11 The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

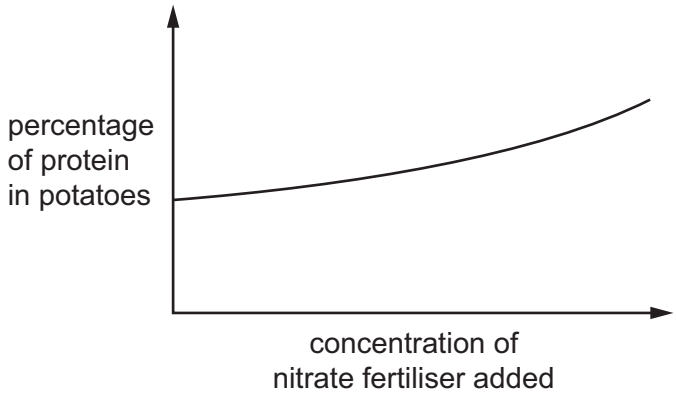
A carbon dioxide concentration

B light intensity

C surface area of the plant

D temperature

12 The graph shows how the percentage of protein found in potatoes was affected by the concentration of nitrate fertiliser added to the crop when it was growing.



These results suggest that greater concentrations of nitrate fertiliser allow the potatoes to make more

A amino acids.

B cellulose.

C lipid.

D starch.

13 Which stage of nutrition takes place when food molecules become part of a body cell?

A absorption

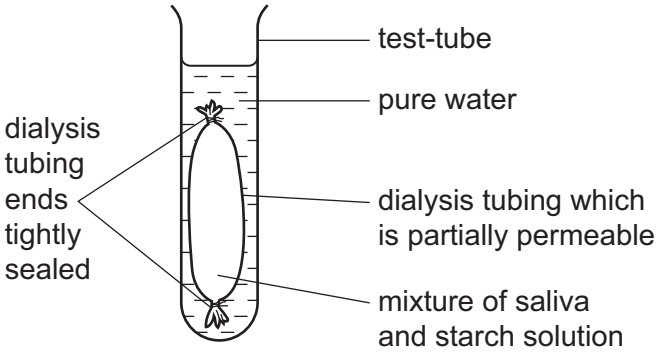
B assimilation

C digestion

D ingestion

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14 The diagram shows the apparatus used in an experiment to demonstrate two processes that take place in the body.



After one hour, the water outside the dialysis tubing contained reducing sugars.

Which two processes are represented by this experiment?

A absorption and digestion

B absorption and egestion

C digestion and egestion

D digestion and ingestion

15 In which order does water pass through these structures in a plant?

A mesophyll → root hair → xylem

B mesophyll → xylem → root hair

C root hair → mesophyll → xylem

D root hair → xylem → mesophyll

16 What is a function of phloem?

A transports minerals to the roots

B transports starch to the roots

C transports sugar to the roots

D transports water to the roots

17 What ensures that blood flows in one direction in the human circulatory system?

A diffusion of carbon dioxide

B diffusion of oxygen

C thick walled arteries

D valves

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18 The diagrams show four components of blood.

Which component produces antibodies?



19 A patient was injected with antibodies after being bitten by a poisonous snake. The patient recovered and survived.

What describes the effect in the patient's body?

	active immunity	passive immunity	memory cells produced
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

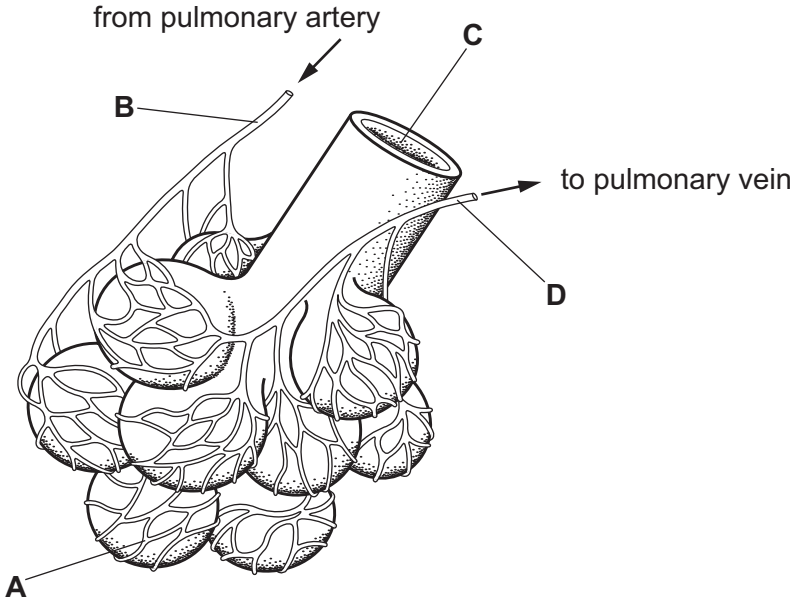
key

✓ = yes

✗ = no

20 The diagram shows some of the structures in a human lung.

Where is the carbon dioxide concentration highest?



21 What is produced during anaerobic respiration in muscles?

A carbon dioxide

B ethanol

C lactic acid

D water

22 How do the concentrations of glucose and urea in urine compare to their concentrations in blood plasma?

	glucose concentration in urine (compared to blood plasma)	urea concentration in urine (compared to blood plasma)
A	higher	lower
B	higher	same
C	same	same
D	lower	higher

23 Which structure contains relay neurones?

A gland

B muscle

C spinal cord

D synapse

24 A man injures his arm in an accident. Afterwards, he can move his hand but cannot feel objects touching his hand.

What could cause this?

A Both sensory and motor neurones are cut.

B Effectors are damaged.

C Motor neurones are cut.

D Sensory neurones are cut.

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[Turn over

25 How does the skin react when the body becomes cold?

	arterioles supplying the skin surface	sweat production
A	constrict	decreases
B	dilate	increases
C	move towards skin surface	decreases
D	move away from skin surface	increases

26 Which characteristic of viruses prevents them from being affected by antibiotics?

A They cannot reproduce on their own.

B They contain DNA or RNA.

C They have no cell structure.

D They are much smaller than bacteria.

27 Some flowers can only be pollinated by specific insect species.

What will happen if none of these insects are present?

A genetically different seed produced

B genetically identical seed produced

C no seed produced

D only small amounts of seed produced

28 Which hormone is used in contraceptive pills?

A insulin

B LH

C FSH

D progesterone

29 Which hormone causes the lining of the uterus to become thick and glandular before ovulation?

A adrenaline

B FSH

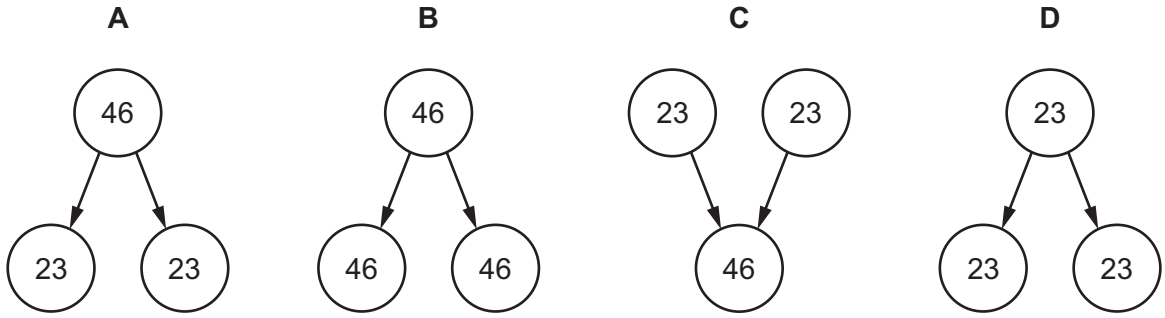
C oestrogen

D progesterone

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30 The diagrams show human nuclei and the number of chromosomes in each nucleus.

Which diagram represents nuclear division of skin cells for growth and repair?



31 Meiosis is sometimes called 'reduction division'.

What is reduced during meiosis?

A Body cells are reduced in size.

B Chromosomes are reduced in number.

C The number of gametes is reduced.

D The rate of cell division is reduced.

32 In guinea pigs, the allele for black fur is dominant and the allele for white fur is recessive.

A test cross can be used to determine the genotype of a black guinea pig.

What would be the expected result of the test cross if the black guinea pig was heterozygous?

A 50% black, 50% white

B 25% black, 75% white

C 100% black

D 100% white

33 What is **not** affected by the environment?

A height

B skin colour

C blood group

D weight

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[Turn over

34 Desert plants have evolved to survive in places where very little water is available.

Which process is reduced to enable them to retain as much water as possible?

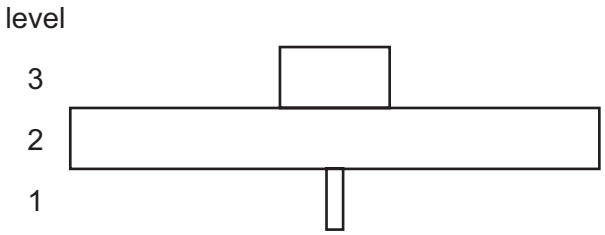
A transpiration

B translocation

C respiration

D digestion

35 The diagram shows a pyramid of numbers.



What is the correct description of the trophic levels?

	trophic level		
	1	2	3
A	producers	primary consumers	secondary consumers
B	producers	secondary consumers	tertiary consumers
C	secondary consumers	primary consumers	producers
D	secondary consumers	tertiary consumers	producers

36 Bacteria are active in the nitrogen cycle.

Which process in the nitrogen cycle is carried out by nitrifying bacteria?

A the conversion of nitrogen gas to ammonia

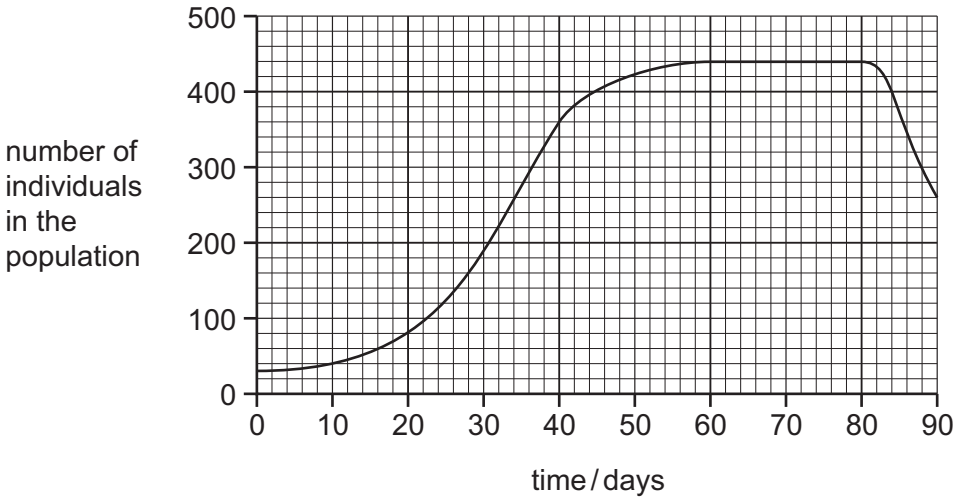
B the conversion of nitrogen gas to nitrates

C the conversion of ammonia to nitrates

D the conversion of nitrates to nitrogen

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37 The diagram shows a population growth curve.



How long does the population remain in the stationary phase?

A 8 days

B 12 days

C 23 days

D 48 days

38 The stages describe how genetic engineering can be used to produce human insulin from bacteria.

1 cut bacterial plasmid DNA with restriction enzymes

2 extract gene for insulin from human DNA with restriction enzymes

3 insert recombinant plasmid into bacteria

4 join human DNA to bacterial plasmid DNA using DNA ligase

5 replicate bacteria containing recombinant plasmid

Which sequence will lead to the production of human insulin by bacteria?

A $2 \rightarrow 1 \rightarrow 4 \rightarrow 3 \rightarrow 5$

B $2 \rightarrow 5 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C $4 \rightarrow 2 \rightarrow 3 \rightarrow 1 \rightarrow 5$

D $4 \rightarrow 3 \rightarrow 5 \rightarrow 1 \rightarrow 2$

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[Turn over

39 What is an example of sustainable use of resources?

A allowing only young fish to be caught

B cutting down a forest and not replanting trees

C controlling the number of fish caught with quotas

D planting deforested areas with one species of crop plant

40 The hormones from the female contraceptive pill can pollute water courses.

What effect do they have?

A decrease the amount of oxygen for fish

B decrease the sperm count of men

C increase the growth of producers

D increase the number of decomposers

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