Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

BIOLOGY **5090/12**

Paper 1 Multiple Choice **May/June 2014**

1 hour

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

0237980137

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.

IB14 06_5090_12/3RP
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1 What are found in plant cells but **not** in animal cells?

1 cell membrane

2 nucleus

3 cell wall

4 chloroplast

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

2 Which statement is always correct when oxygen is diffusing out of a plant cell?

A The concentration of carbon dioxide is higher inside the cell than outside.

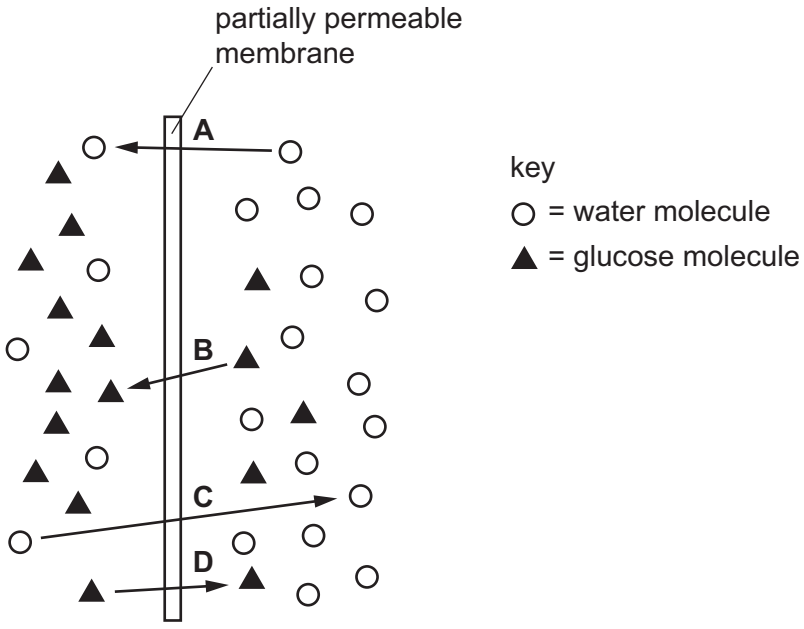
B The concentration of carbon dioxide is higher outside the cell than inside.

C The concentration of oxygen is higher inside the cell than outside.

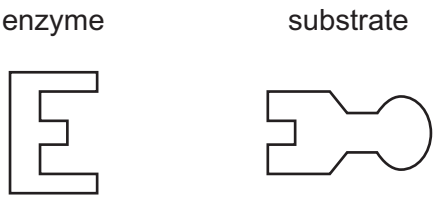
D The concentration of oxygen is higher outside the cell than inside.

3 The diagram represents the passage of water molecules and glucose molecules across a partially permeable cell surface membrane.

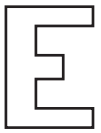
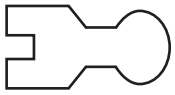
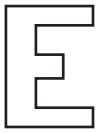
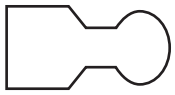
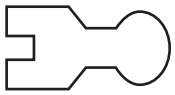
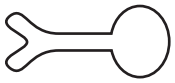
Which arrow indicates osmosis?



4 The diagram represents the 'lock and key' mechanism of an enzyme that works best at pH 7.



What shows the enzyme and its substrate at pH 13?

	enzyme	substrate
A		
B		
C		
D		

5 What are the signs of magnesium deficiency and nitrogen deficiency in leaves of plants?

1 purple spots on leaves

2 reduced growth of roots

3 reduced growth with loss of leaf colour

4 yellowing of leaves between the veins

	magnesium deficiency	nitrogen deficiency
A	2	1
B	2	3
C	4	1
D	4	3

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6 When carbon dioxide is being used in photosynthesis, what is its diffusion pathway in a leaf after entering a stoma?

1 cell membrane

2 cell wall

3 chloroplast membrane

4 cytoplasm

5 intercellular spaces

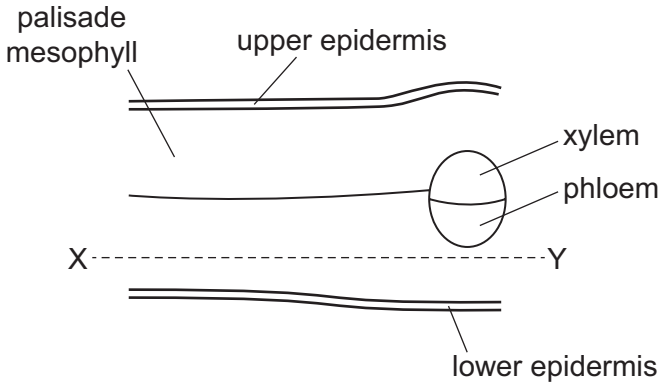
A $2 \rightarrow 1 \rightarrow 5 \rightarrow 4 \rightarrow 3$

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

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

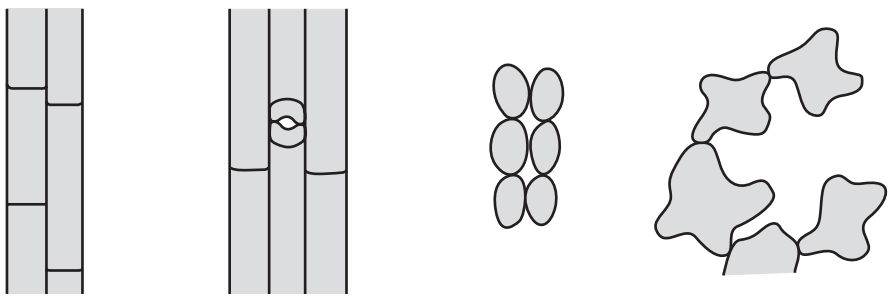
D $5 \rightarrow 2 \rightarrow 1 \rightarrow 4 \rightarrow 3$

7 The diagram shows the arrangement of the tissues of a leaf as seen in cross-section under the microscope.



What is the arrangement of the cells in the section X-Y?

A **B** **C** **D**



8 Which combination of mineral and vitamin is required for strong bones?

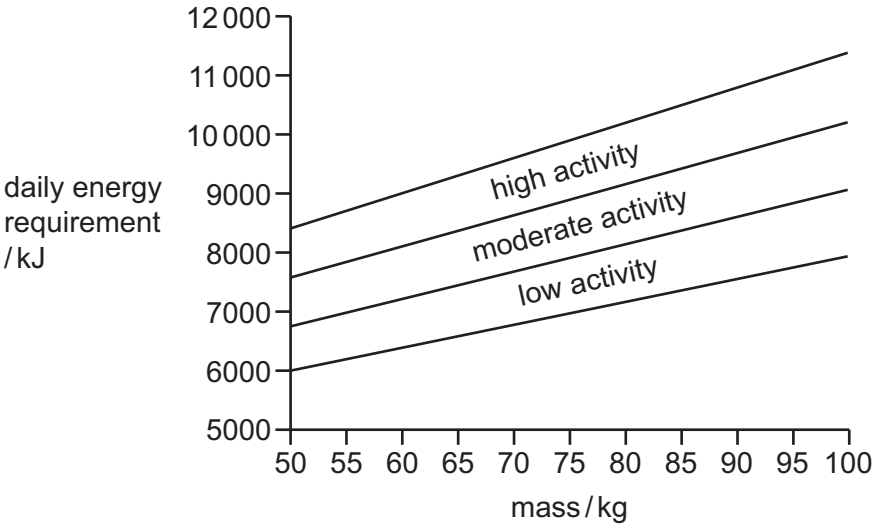
A calcium and vitamin C

B calcium and vitamin D

C iron and vitamin C

D iron and vitamin D

9 The graph can be used to estimate the daily energy requirements of women, depending on their mass and level of activity.



What is the estimated daily energy requirement of a woman of mass 75 kg who has a moderate level of activity?

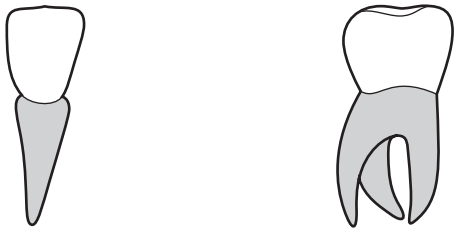
A 5000-6750 kJ

B 7000-7750 kJ

C 7750-8750 kJ

D 9250-10 000 kJ

10 The diagram shows two different human teeth, P and Q, drawn from the front.



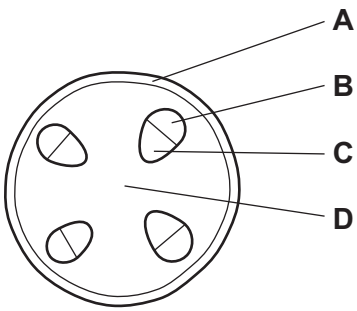
P Q

What are the functions of these teeth?

	P	Q
A	cutting	cutting
B	cutting	grinding
C	grinding	cutting
D	grinding	grinding

11 The diagram shows a section through the stem of a dicotyledonous plant.

Which tissue transports sugars through the stem?



12 What is the main source of the energy that causes water to rise up a plant stem?

A difference in water potential between cell sap and soil water

B heat from the Sun

C light absorbed by chlorophyll

D respiration of sugars made in photosynthesis

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13 Which sequence shows the shortest route taken by blood travelling from a leg to an arm in the human body?

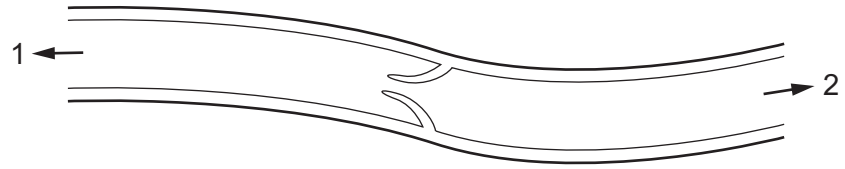
A leg → heart → lungs → heart → arm

B leg → heart → lungs → kidney → arm

C leg → kidney → heart → lungs → arm

D leg → lungs → heart → alimentary canal → arm

14 The diagram shows a section through part of a vein.

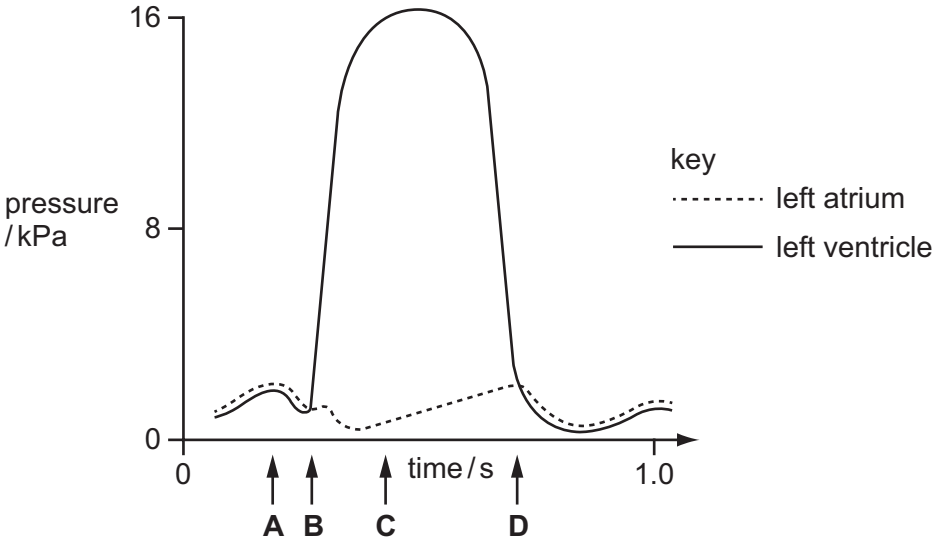


What could be the first organs found in the directions 1 and 2?

	1	2
A	heart	brain
B	intestine	liver
C	kidney	heart
D	lung	heart

15 The graph shows the pressure changes in the left atrium and the left ventricle while the heart is beating.

When does the atrio-ventricular (bicuspid) valve close?



16 What are the products of aerobic respiration in a muscle?

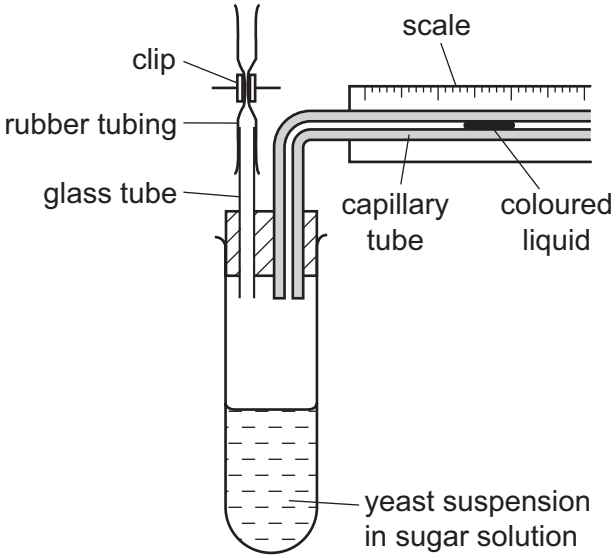
A carbon dioxide, water and ethanal

B heat, lactic acid and water

C lactic acid, heat and carbon dioxide

D water, carbon dioxide and heat

17 The diagram shows apparatus that can be used to measure the rate of anaerobic respiration of yeast.



Which precautions must be taken during the setting up of this apparatus?

P A layer of oil must be poured over the surface of the yeast suspension.

Q The clip must not be closed until the yeast suspension has had time to reach room temperature.

R The coloured liquid must be near the right hand end of the capillary tube.

S The yeast suspension must be made with boiled and cooled water.

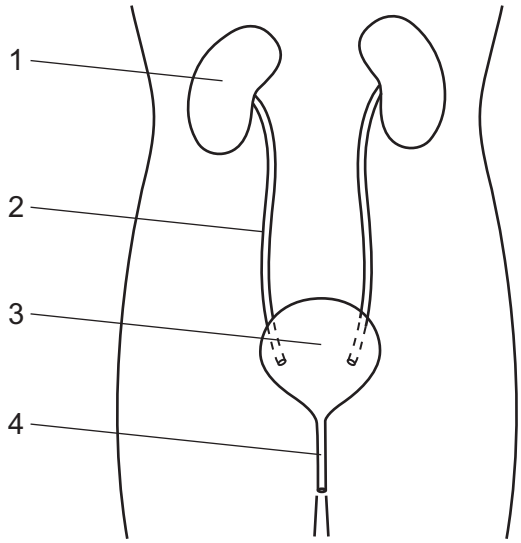
A P, Q and R **B** Q, R and S **C** R, S and P **D** S, P and Q

18 What happens to the volume of the thorax and the air pressure in the lungs during breathing out?

	volume of thorax	air pressure in lungs
A	decreases	increases
B	decreases	remains constant
C	increases	increases
D	increases	remains constant

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19 The diagram shows the human urinary system.



What are the correct labels for structures 1, 2, 3 and 4?

	1	2	3	4
A	bladder	ureter	kidney	urethra
B	bladder	urethra	kidney	ureter
C	kidney	ureter	bladder	urethra
D	kidney	urethra	bladder	ureter

20 Which part of the brain controls body temperature?

A cerebellum

B cerebrum

C hypothalamus

D medulla

21 What is the role of motor neurones in reflex action?

A carrying nerve impulses from the central nervous system to an effector

B connecting a receptor to the central nervous system

C forming a synapse with a sensory neurone

D transferring energy from the stimulus to a nerve impulse

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[Turn over

22 Opticians sometimes place drops of a chemical in a patient's eye to keep the pupil wide open.

Which muscles contract when this chemical is used?

A ciliary muscles

B circular iris muscles

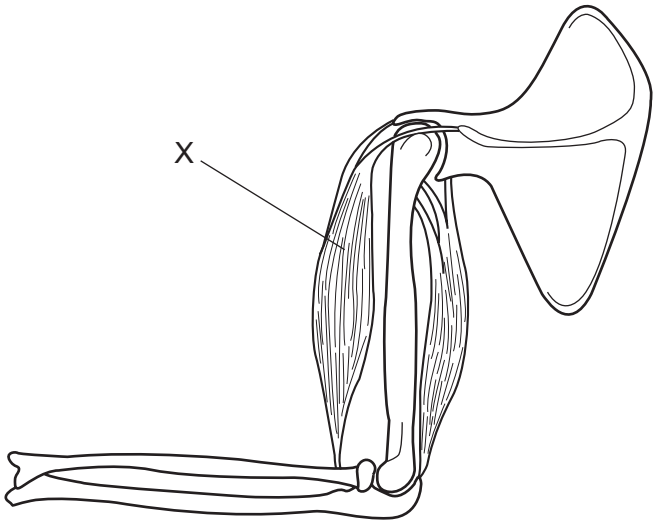
C muscles that move the eyeball

D radial iris muscles

23 How does adrenaline affect glucose uptake by muscle cells and carbohydrate conversion by liver cells?

	glucose uptake	carbohydrate conversion
A	decreases	glucose to glycogen
B	decreases	glycogen to glucose
C	increases	glucose to glycogen
D	increases	glycogen to glucose

24 The diagram shows parts of the human forelimb.

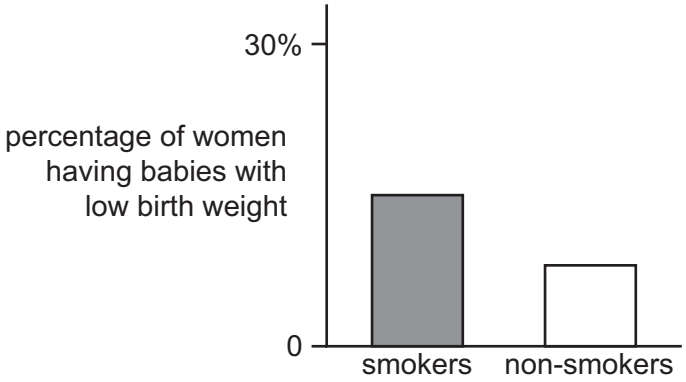


What will happen if a nerve impulse stimulates X?

	muscle contracted	effect
A	biceps	arm bends
B	biceps	arm straightens
C	triceps	arm bends
D	triceps	arm straightens

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25 The bar chart shows the percentage of women who had babies of low weight, amongst smokers and non-smokers.



What is shown by the bar chart?

A More women smoke during pregnancy than do not.

B Smoking in pregnancy increases the risk of low birth weight.

C Smoking is bad for the health of a pregnant woman.

D Women whose babies have low birth weight are smokers.

26 Yeast is used in alcohol production.

Under which conditions will yeast produce most alcohol?

	glucose present	oxygen present
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

27 Using the key, which organism is a virus?

1 has a cell wall ..... go to 2
does not have a cell wall ..... go to 3

2 cell wall is made of chitin ..... organism **A**
cell wall is made of cellulose ..... organism **B**

3 has a cell membrane ..... organism **C**
has a protein coat ..... organism **D**

28 Which statement correctly describes relationships in ecosystems?

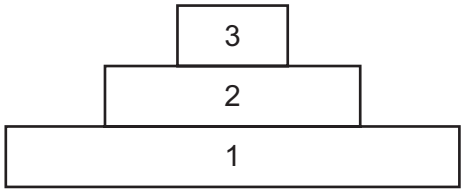
A Carbohydrates are passed from decomposers to producers.

B Energy is passed from carnivores to herbivores.

C Proteins are passed from primary consumers to producers.

D Water is passed from respiring decomposers to producers.

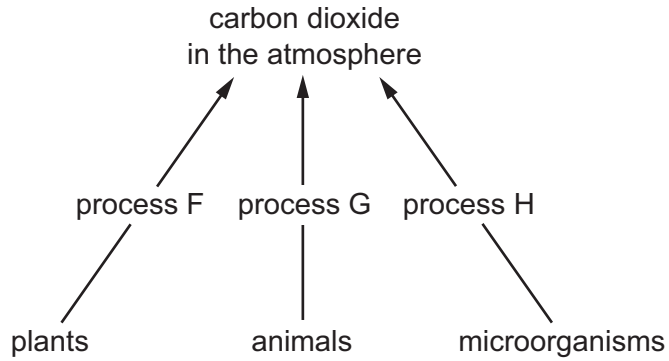
29 The diagram shows a pyramid of biomass.



What do levels 1, 2 and 3 represent?

	1	2	3
A	carnivore	herbivore	producer
B	carnivore	producer	herbivore
C	producer	carnivore	herbivore
D	producer	herbivore	carnivore

30 The diagram shows some of the stages in the carbon cycle.



What are processes F, G and H?

	process F	process G	process H
A	photosynthesis	respiration	photosynthesis
B	photosynthesis	respiration	respiration
C	respiration	respiration	respiration
D	respiration	photosynthesis	photosynthesis

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31 Which words can all be applied to the organism that causes malaria?

A microscopic, parasite, sexually transmitted

B microscopic, parasite, pathogen

C mosquito, pathogen, vector

D parasite, sexually transmitted, vector

32 Which activities can lead to soil instability?

	deforestation	use of insecticides
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

33 What is the function of the sepals of most flowers?

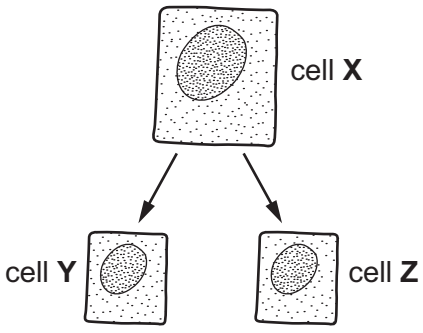
A to attract insects

B to produce pollen

C to protect flower buds

D to receive pollen

34 Cell **X** contains 24 chromosomes. It divides by mitosis to produce cells **Y** and **Z**.



How many chromosomes does cell **Z** contain?

A 12 **B** 24 **C** 46 **D** 48

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35 What are the symptoms in the different stages of syphilis?

	first stage	second stage	third stage
A	a single sore on the skin	fever, widespread skin rash	heart disease, dementia
B	headaches, fever	widespread skin rash	hair loss, liver disease
C	slight fever	few or no symptoms	death from serious infectious disease
D	widespread skin rash	fever, sores on the skin	hair loss, liver disease

36 Which substances are present in breast milk but **not** in bottled milk made from milk powder?

A antibodies

B carbohydrates

C proteins

D vitamins

37 What is the effect of environment on discontinuous variation, and what is an example of this type of variation in humans?

	environmental effect	example
A	large	ABO blood group system
B	large	height
C	small	ABO blood group system
D	small	height

38 In the inheritance of blood groups in humans, the MN system is controlled by a single gene. The gene has two alleles, M and N, that are co-dominant.

The offspring of two parents were two boys of blood group MN and M and a girl of blood group N.

What are possible genotypes of the parents?

	father's genotype	mother's genotype
A	MM	MN
B	MN	MN
C	NN	MM
D	NN	MN

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39 Which statement about chromosomes is correct?

A Chromosomes are long DNA molecules called genes which are divided into sections.

B Chromosomes include a long molecule of DNA divided into sections called genes.

C Chromosomes include genes which are divided into sections called DNA molecules.

D Genes include long DNA molecules called chromosomes.

40 Which statement is **always** true of dominant alleles?

A They cannot undergo mutation.

B They give a greater chance of survival than recessive alleles.

C They give the same phenotype in heterozygotes and homozygotes.

D They occur more frequently in the population than recessive alleles.

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