



National
Qualifications
SPECIMEN ONLY

SQ03/N5/01

Biology
Section 1—Questions

Date — Not applicable

Duration — 2 hours

Instructions for completion of Section 1 are given on Page two of the question paper SQ03/N5/02.

Record your answers on the grid on Page three of your answer booklet

Do NOT write in this booklet.

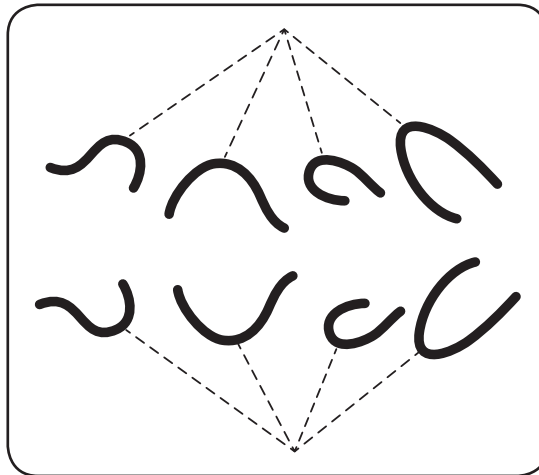
Before leaving the examination room you must give your answer booklet to the Invigilator. If you do not, you may lose all the marks for this paper.



* S Q 0 3 N 5 0 1 *

SECTION 1

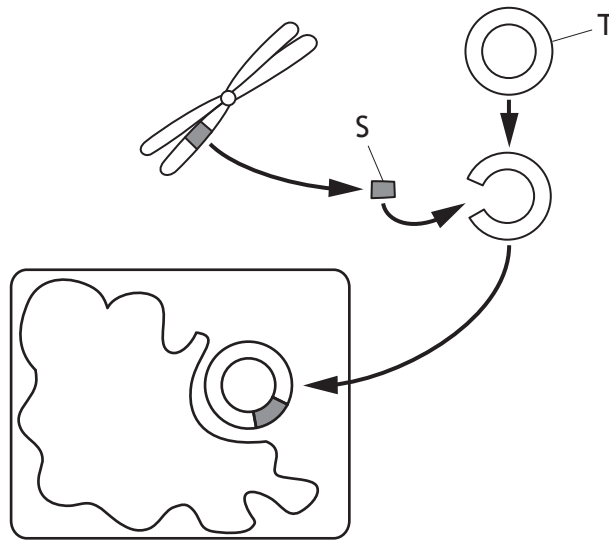
1. The diagram below shows one of the stages of mitosis in the root tip of a plant.



Which of the following statements describes the stage shown?

- A Chromosomes line up at the equator of the cell
 - B Daughter chromosomes gather at the ends of the cell
 - C Chromosomes become visible as pairs of identical chromatids
 - D Spindle fibres pull chromatids to opposite poles of the cell
2. A reaction takes place because the active site of an enzyme is complementary to
- A one type of substrate molecule
 - B all types of substrate molecule
 - C one type of product molecule
 - D all types of product molecules.

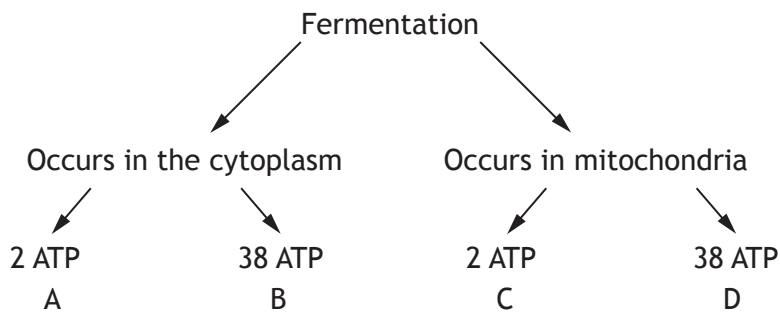
3. The diagram below shows stages in the production of a substance, such as insulin, by genetic engineering.



Which line in the table below correctly identifies S and T?

	S	T
A	Gene	Plasmid
B	Gene	Bacterium
C	Chromosome	Plasmid
D	Chromosome	Bacterium

4. Which of the following shows the correct location and number of ATP molecules released from a molecule of glucose during fermentation?



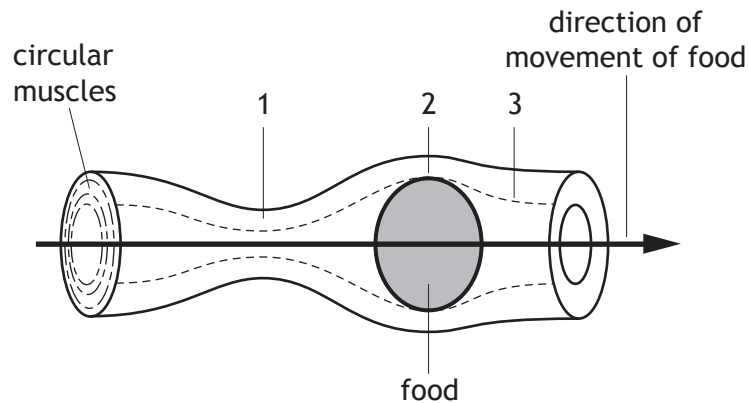
5. The following statements relate to meristems.

1	They produce non-specialised cells
2	They are the sites of gamete production
3	They are found only in plants
4	They are found only in animals

Which of the above statements are correct?

- A 1 and 2 only
- B 1 and 3 only
- C 2 and 3 only
- D 2 and 4 only

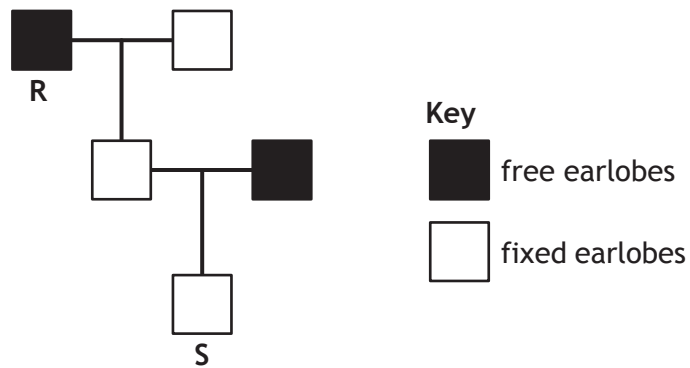
6. The diagram below shows the movement of food along the oesophagus by peristalsis.



Which line in the table below correctly describes the state of the circular muscles at points 1, 2 and 3 on the diagram?

	<i>Circular muscles</i>		
	<i>Point 1</i>	<i>Point 2</i>	<i>Point 3</i>
A	contracted	relaxed	contracted
B	relaxed	contracted	contracted
C	contracted	relaxed	relaxed
D	relaxed	contracted	relaxed

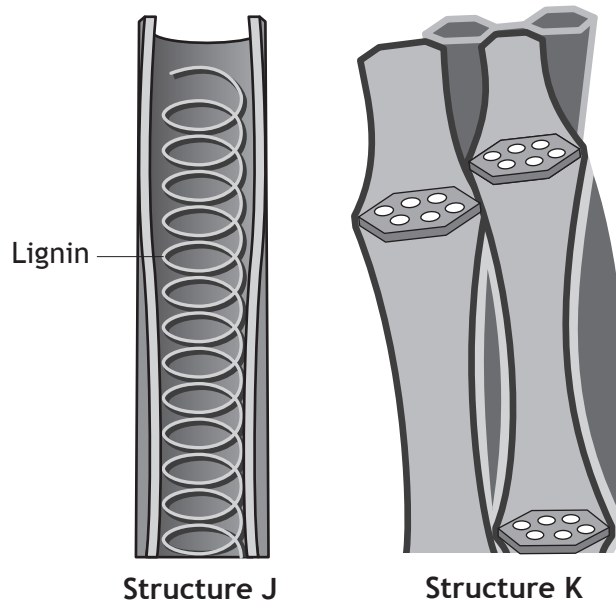
7. In humans the inheritance of earlobe type is an example of discrete variation. The allele for free earlobes (E) is dominant to the allele for fixed earlobes (e). The diagram below shows the inheritance of this characteristic.



Which line in the table below correctly identifies the genotypes of individuals R and S?

	<i>Genotype</i>	
	R	S
A	EE	ee
B	Ee	ee
C	Ee	Ee
D	ee	EE

8. The diagram below shows some of the structures involved in transport in plants.



Which line in the table below correctly identifies structures J and K and the substances transported by them?

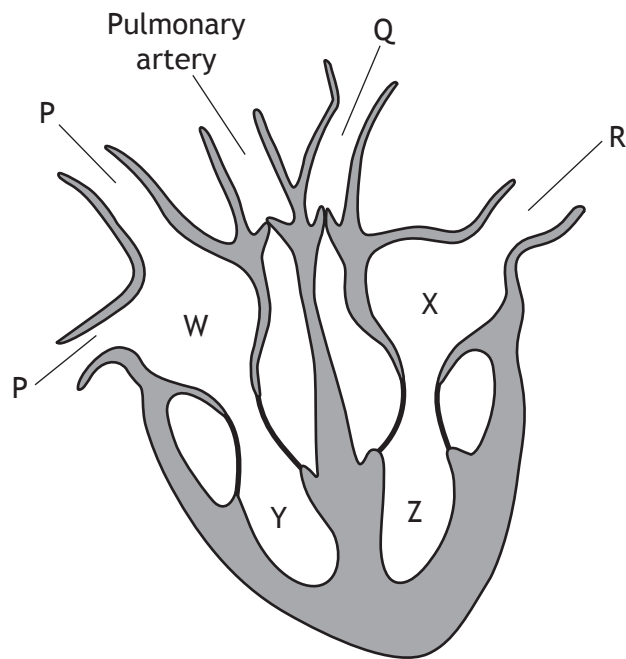
	Structure J		Structure K	
	Name	Substance transported	Name	Substance transported
A	Xylem	Water	Phloem	Sugar
B	Xylem	Sugar	Phloem	Water
C	Phloem	Water	Xylem	Sugar
D	Phloem	Sugar	Xylem	Water

9. Transpiration occurs from the leaves of a plant.

Which environmental conditions would produce the greatest transpiration rate?

- A Warm and still air
- B Cold and still air
- C Warm and windy
- D Cold and windy

Questions 10 and 11 refer to the diagram of the heart below.



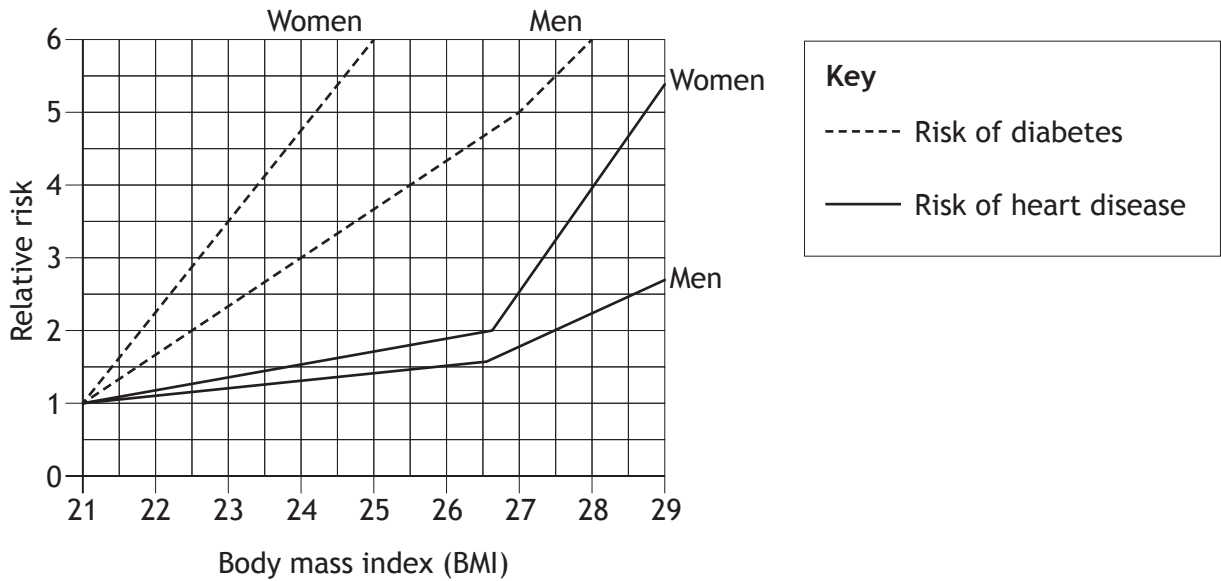
10. Which line in the table below correctly identifies the four chambers of the heart labelled W, X, Y and Z?

	W	X	Y	Z
A	Right ventricle	Left ventricle	Right atrium	Left atrium
B	Right ventricle	Left ventricle	Left atrium	Right atrium
C	Right atrium	Left atrium	Left ventricle	Right ventricle
D	Right atrium	Left atrium	Right ventricle	Left ventricle

11. Which line in the table below correctly identifies the type of blood carried in blood vessels P, Q and R?

	P	Q	R
A	deoxygenated	oxygenated	oxygenated
B	deoxygenated	oxygenated	deoxygenated
C	oxygenated	deoxygenated	oxygenated
D	oxygenated	deoxygenated	deoxygenated

12. The graph below shows the risk of heart disease and diabetes relative to a body mass index of 21.

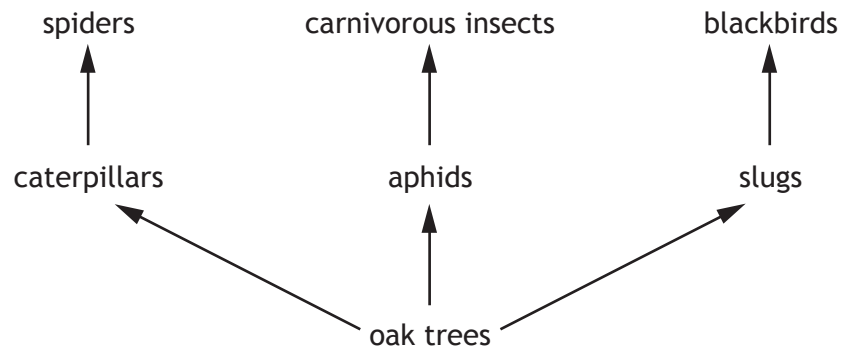


Which of the following statements is correct?

Compared to a BMI of 21

- A women with a BMI of 25 have a six times greater risk of getting heart disease
 - B men with a BMI of 24 have a three times greater risk of getting heart disease
 - C women with a BMI of 28 have a four times greater risk of getting diabetes
 - D men with a BMI of 27 have a five times greater risk of getting diabetes.
13. The total variety of all living things on Earth is described as
- A an ecosystem
 - B biodiversity
 - C a population
 - D competition.
14. Which of the following statements about a woodland describes a community?
- A All the oak trees
 - B All the plants
 - C All the oak trees and blackbirds
 - D All the plants and animals

15. The diagram below shows part of a food web in an oak woodland.



The use of insecticides in a nearby field resulted in the death of most aphids and caterpillars.

Which line in the table identifies the effect on the numbers of slugs and carnivorous insects?

	<i>Number of slugs</i>	<i>Number of carnivorous insects</i>
A	decreases	stays the same
B	increases	decreases
C	decreases	increases
D	increases	stays the same

Questions 16 and 17 refer to the following information.

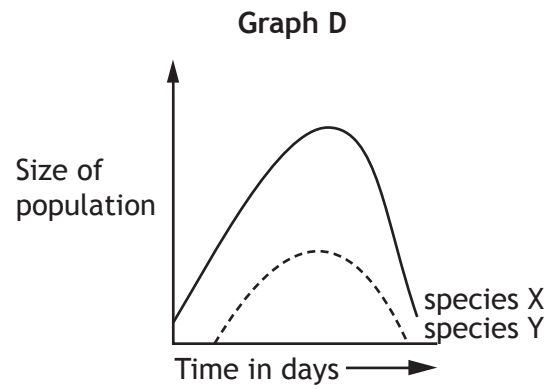
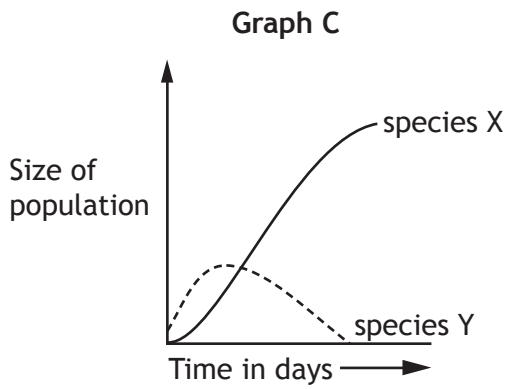
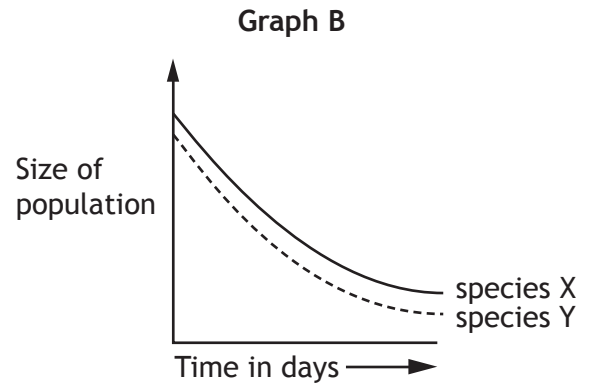
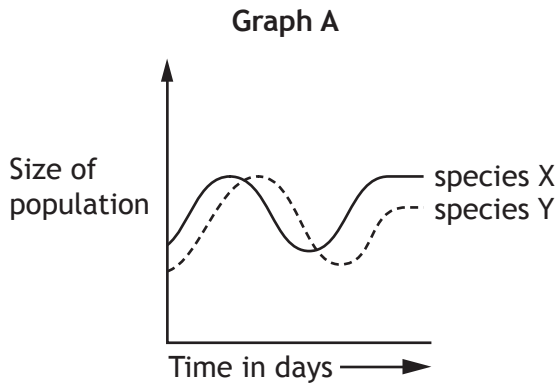
An investigation was carried out into the effect of a hedge on the growth of wheat plants.

Groups of 100 wheat plants were planted at different distances from the hedge. The heights of the plants were measured after six weeks and the results are shown in the table.

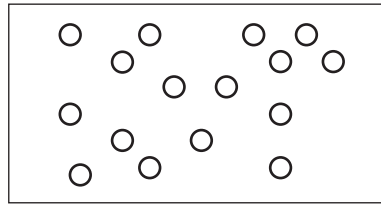
<i>Distance planted from hedge (m)</i>	<i>Average height of wheat after six weeks (cm)</i>
2.0	45
2.5	54
3.0	60
3.5	69
4.0	78
4.5	90

16. The reliability of the results was increased by
- A measuring the height of plants after six weeks
 - B planting groups of 100 wheat plants
 - C planting the wheat plants at different distances from the hedge
 - D calculating an average height of wheat plants.
17. What is the percentage increase in average height of wheat planted between 2.0 m and 4.5 m from the hedge?
- A 45%
 - B 50%
 - C 66%
 - D 100%
18. One of the roles of decomposers in an ecosystem is to
- A convert protein and waste into ammonia and nitrates
 - B produce animal and plant protein from nitrates
 - C convert nitrogen from the air into ammonia and nitrates
 - D release nitrogen into the air from nitrates.

19. Which one of the following graphs shows the effects of competition for the same food between a successful species and an unsuccessful species?

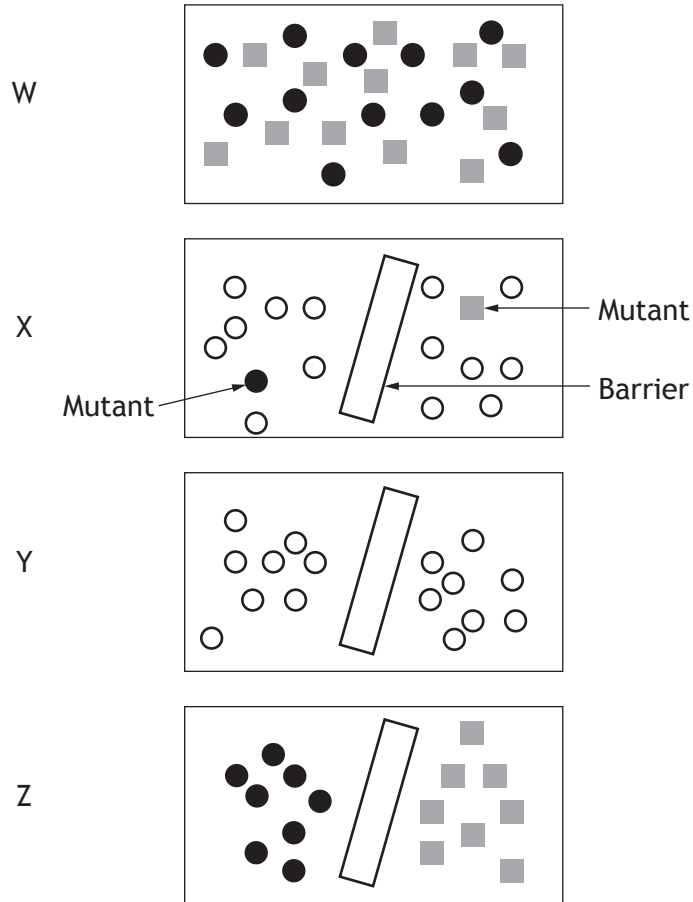


20. The diagram below represents a population of animals.



The following diagrams show the stages of speciation occurring from this population.

Stage



The correct order of the stages of speciation is

- A Z, W, X, Y
- B Z, X, W, Y
- C Y, X, Z, W
- D Y, Z, X, W.

[END OF SECTION 1. NOW ATTEMPT THE QUESTIONS IN SECTION 2 OF YOUR QUESTION AND ANSWER BOOKLET]