Surname:	**First Name:**

Current School:

Shrewsbury School

SHREWSBURY SCHOOL

SIXTH FORM ENTRANCE EXAMINATION 2025 ENTRY

BIOLOGY

(1 Hour)

Instructions to candidates:

- Please answer all questions. Calculators may be used.
- Questions 1-40 are multiple choice: **record your answers in the grid provided.**
- **Be sure to leave about 20 minutes for questions 41 and 42**: these should be answered in the spaces provided in the booklet.

Multiple choice answers

1	**11**	**21**	**31**
2	**12**	**22**	**32**
3	**13**	**23**	**33**
4	**14**	**24**	**34**
5	**15**	**25**	**35**
6	**16**	**26**	**36**
7	**17**	**27**	**37**
8	**18**	**28**	**38**
9	**19**	**29**	**39**
10	**20**	**30**	**40**

1 Which characteristic is shown when a person smells a gas in the air?

A excretion

B movement

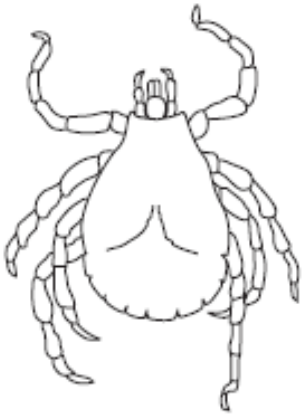
C respiration

D sensitivity

2 The diagram shows four arthropods.

Pediculus ×20

Anopheles ×10



Dermacentor ×7

Carcinus ×0.5

How many of these arthropods are insects?

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

3 An organism has dry scales covering its body.

To which vertebrate group does it belong?

A amphibian

B fish

C mammal

D reptile

4 The diagram shows an animal.

Use the key to identify the animal.

1	has legs	go to 2
	has no legs	go to 3
2	has a shell	animal **A**
	has no shell	animal **B**
3	has one muscular foot	animal **C**
	has more than one foot	animal **D**

5 The diagram shows four specialised cells.

liver cell | white blood cell | muscle cell | sperm cell

Which feature is **not** common to all of these cells?

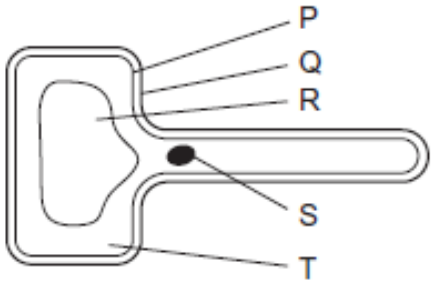
A cell membrane

B cytoplasm

C diploid number of chromosomes

D nucleus

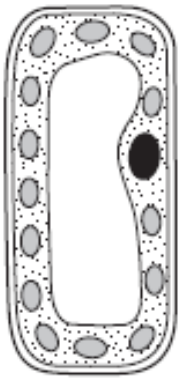
6 The diagram shows a plant cell.



Which labelled structures are found in plant cells but **not** in animal cells?

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

7 The diagram shows another plant cell.



Which feature shows that it is a palisade cell?

A a large nucleus

B a large vacuole

C a thick cell wall

D many chloroplasts

8 Which structures are adapted for supporting a plant?

A phloem tissues

B root hair cells

C stomata

D xylem vessels

9 Which describes the structure and function of a red blood cell?

	structure	function
A	cell contents are dead	transport of water
B	has a nucleus	produces antibodies
C	has cilia	moves particles in the respiratory tract
D	has no nucleus	transport of substances

10 Boiling potatoes destroys their cell membranes. A peeled, boiled potato strip is placed in a concentrated solution of salts.

What takes place?

	osmosis	solute diffusion
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key:
✓ = takes place
✗ = does not take place

11 A red blood cell is placed in a concentrated sugar solution.

What happens and why?

A The cell bursts as sugar molecules diffuse into it.

B The cell bursts because the concentrated sugar solution enters it.

C The cell shrinks because sugar molecules leave it.

D The cell shrinks because water leaves it.

12 What are enzymes made of?

A carbohydrates

B DNA

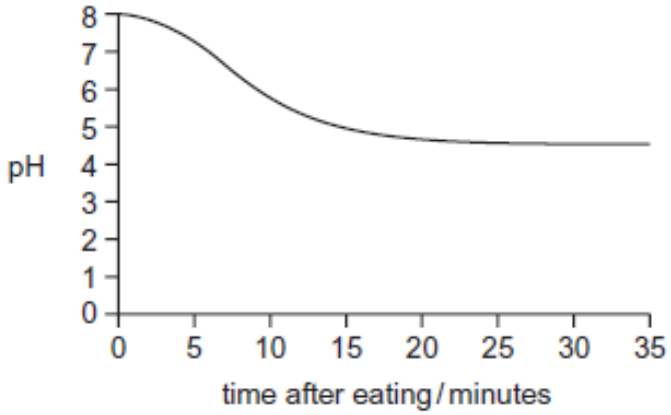
C fats

D proteins

13 At which temperature do most enzymes from the human body become completely denatured?

A 0 °C **B** 27 °C **C** 40 °C **D** 65 °C

14 The graph shows pH changes in the mouth after eating.



Why is it a good idea to brush teeth after eating?

A Acidic conditions help bacteria to grow.

B Acids dissolve tooth enamel.

C Alkaline conditions help bacteria to grow.

D Alkalis dissolve tooth enamel.

15 What does photosynthesis form in a leaf first?

A cellulose

B protein

C starch

D sugar

16 Nutrients are made up of smaller basic units. Nutrients can be identified by food tests.

Which nutrient is a protein?

nutrient	smaller basic units	food test
A	amino acids	Benedict's test
B	amino acids	biuret test
C	sugars	Benedict's test
D	sugars	biuret test

17 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

18 Which two substances are transported in the phloem?

A amino acids and protein

B amino acids and sucrose

C protein and starch

D starch and sucrose

19 The diagram shows some parts from the blood of a mammal.

Which part would contain the breakdown products of bacterial cells?

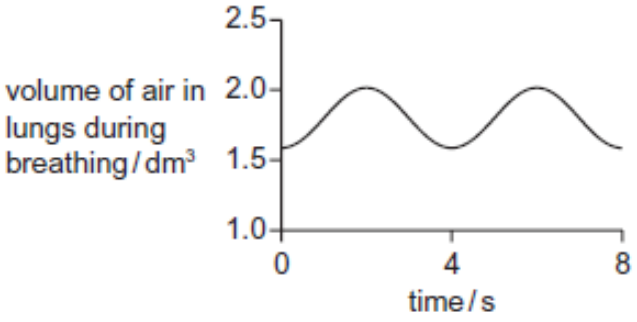
A

B

C

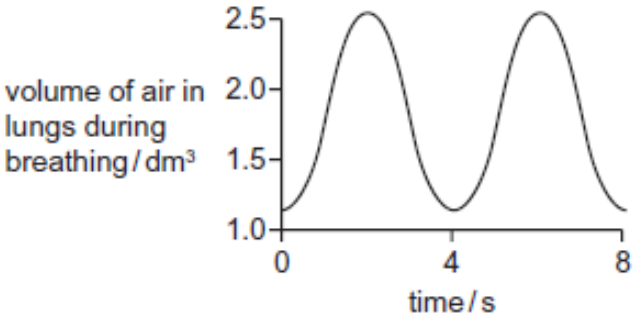
D

20 The graph shows the rate and depth of a person's breathing before exercise.



Which graph shows the rate and depth of breathing of the same person immediately after a period of exercise?

A



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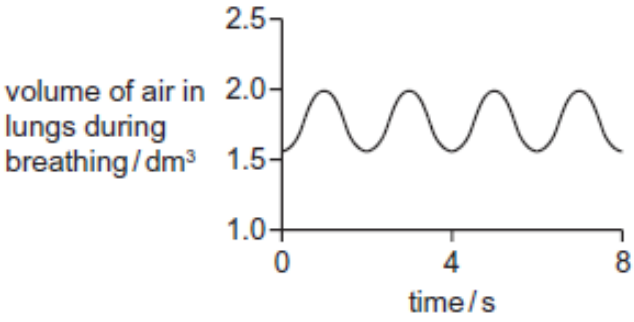
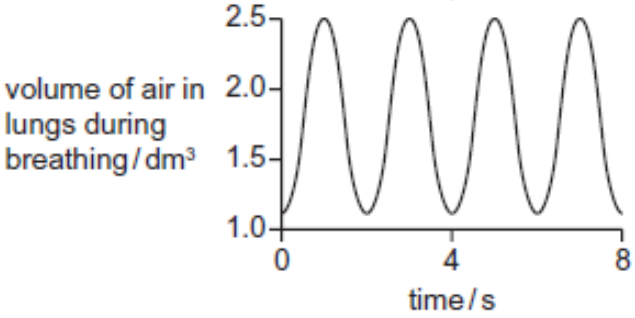


C



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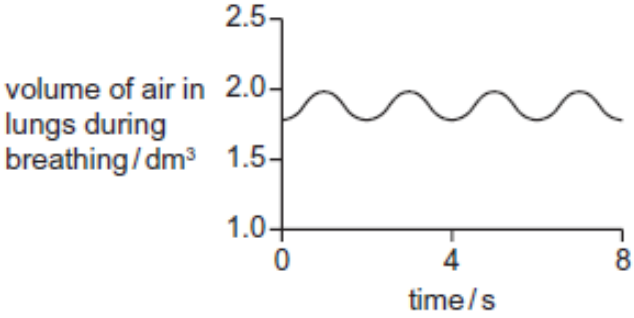
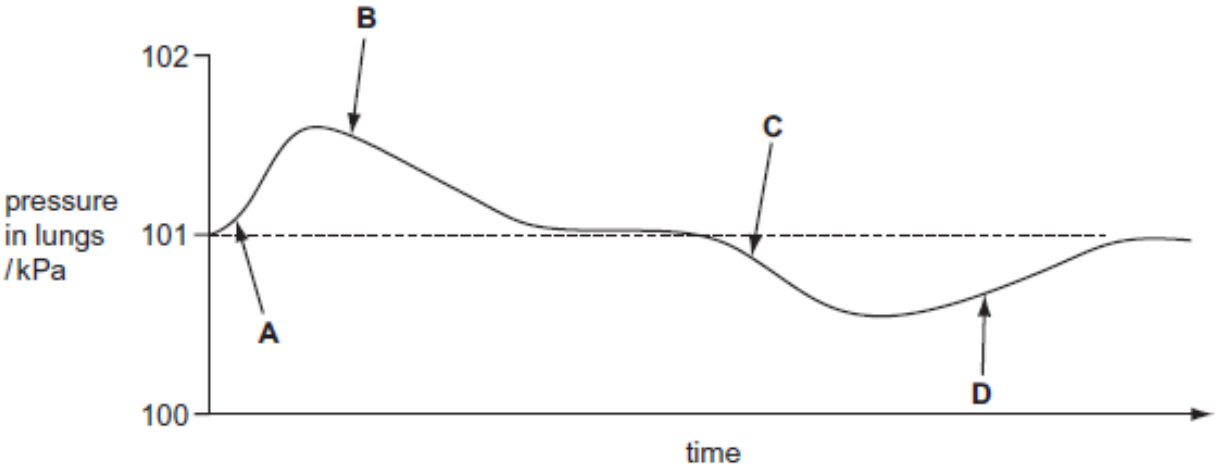


21 The diagram shows changes in air pressure inside the lungs during a complete cycle of breathing. Atmospheric pressure is 101 kPa.

Which position on the graph marks the point at which the ribs are beginning to be raised?



22 Which statement about respiration is **not** correct?

A All living cells respire.

B Heat is always produced.

C Plants respire in the light and in the dark.

D Plants take in carbon dioxide and give out oxygen.

23 In which part of the body do drugs break down?

A brain

B heart

C kidneys

D liver

24 The diagram shows a cell.

What type of cell is shown?

A ciliated cell

B motor neurone

C relay neurone

D sensory neurone

25 When a bright light is shone into the eye, the diameter of the pupil decreases.

What is this an example of?

A accommodation

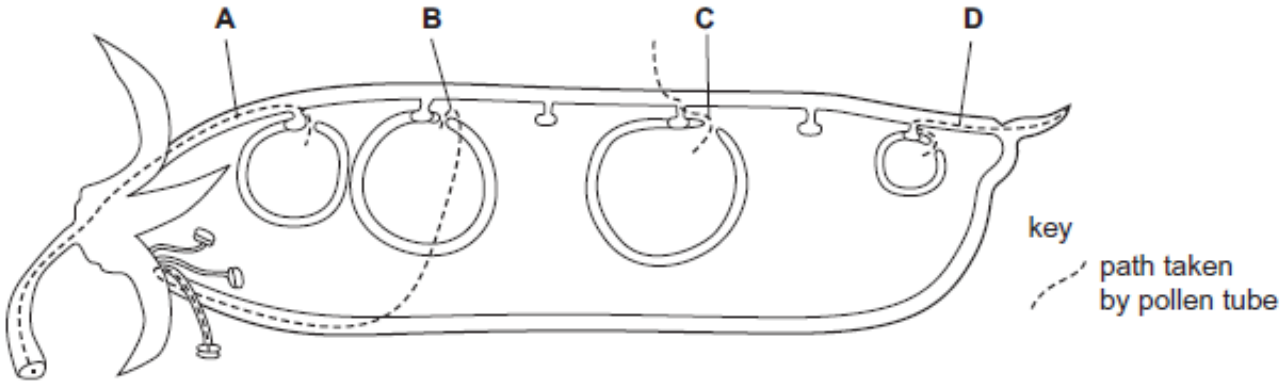
B a simple reflex

C photosynthesis

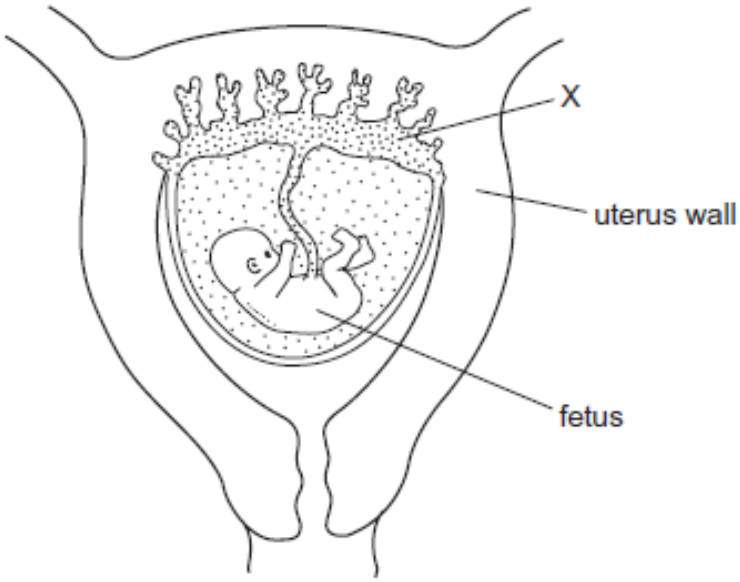
D voluntary response

26 The diagram shows a pod from a pea plant.

Which line correctly shows the path that was taken by a pollen tube to an ovule?



27 The diagram shows a developing human fetus within the uterus.



What is a main function of X?

A passing faeces to the mother

B passing oxygen to the fetus

C passing the mother's blood to the fetus

D protecting the fetus from knocks

28 Which process does **not** involve an increase in dry mass?

A a bacterium getting larger before it divides

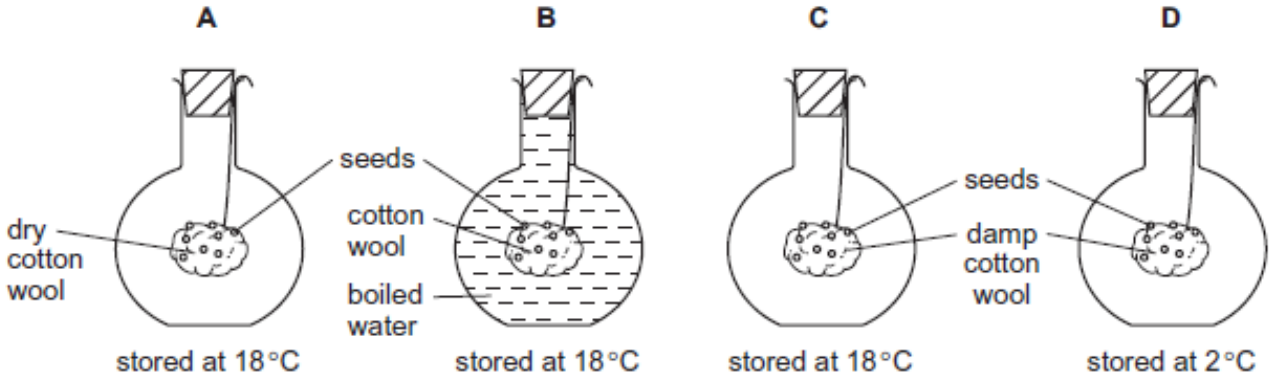
B a fetus developing inside the uterus

C a green shoot growing towards light

D a seed germinating under the ground

29 The diagram shows four flasks which were set up to investigate the conditions needed for germination.

In which experiment will the seeds germinate most quickly?



30 What is **always** found in female gametes and **may** be found in male gametes?

A one X chromosome

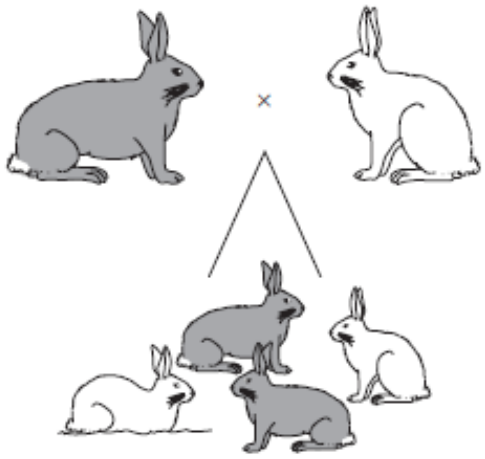
B one Y chromosome

C two X chromosomes

D one X chromosome and one Y chromosome

31 In rabbits, the allele for dark fur, R, is dominant to the allele for white fur, r.

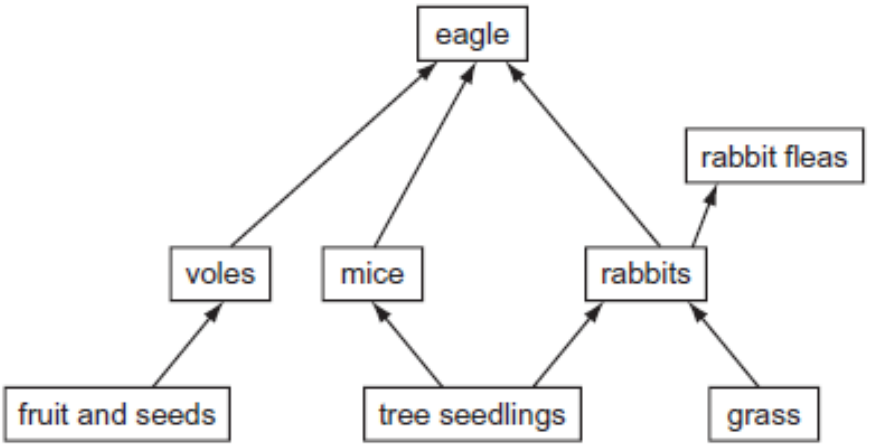
The diagram shows a cross between a rabbit with dark fur and a rabbit with white fur.



What are the genotypes of the offspring?

A Rr and rr **B** RR and rr **C** RR and Rr **D** R and r

32 The diagram shows a food web.



Which of the following is a food chain in this web?

A grass → rabbits → eagle

B grass → voles → eagle

C rabbit fleas → rabbits → grass

D seeds → voles → mice

33 In one habitat, hyaenas eat antelopes and antelopes eat grass.

What is the source of energy for the grass?

A antelopes

B carbon dioxide

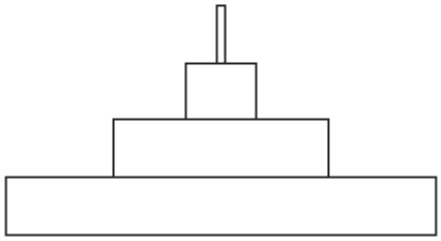
C hyaenas

D the Sun

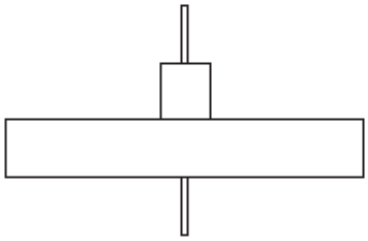
34 A single tree is food for a large population of caterpillars. Several small birds eat the caterpillars. A bird of prey eats the small birds.

Which diagram shows the pyramid of numbers for this food chain?

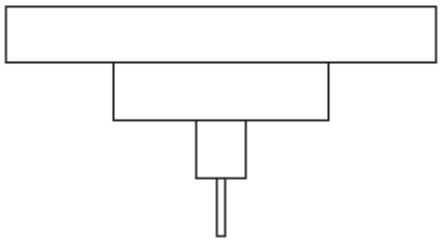
A



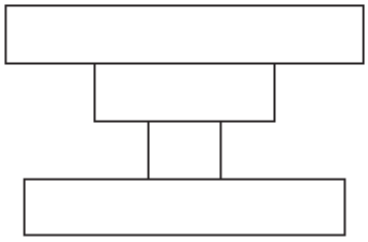
B



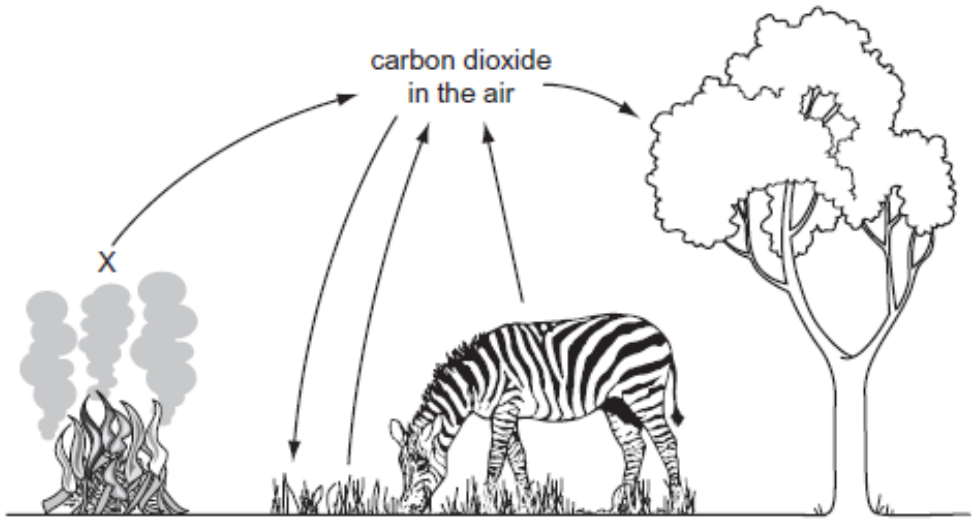
C



D



35 The diagram shows part of the carbon cycle.



Which process is taking place at X?

A combustion

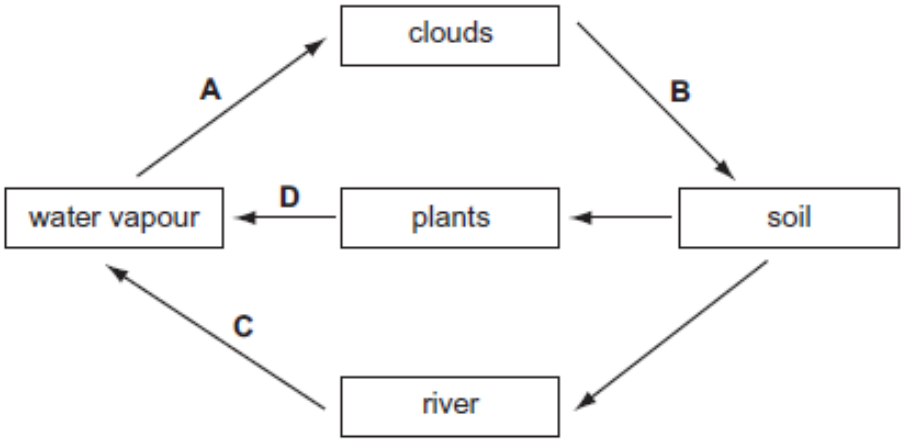
B decomposition

C photosynthesis

D respiration

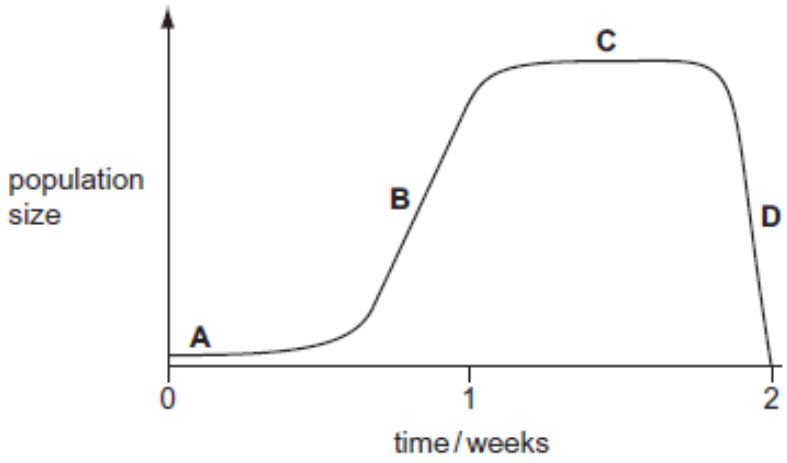
36 The diagram shows part of the water cycle.

Which arrow represents condensation?



37 Some bacteria were grown in a nutrient solution over a period of two weeks. The graph shows how the population of bacteria changed during this time.

Which is the lag phase in the growth of this population?



38 Weeds are growing in a crop.

What should be used to kill the weeds?

A artificial fertiliser

B herbicide

C magnesium salts

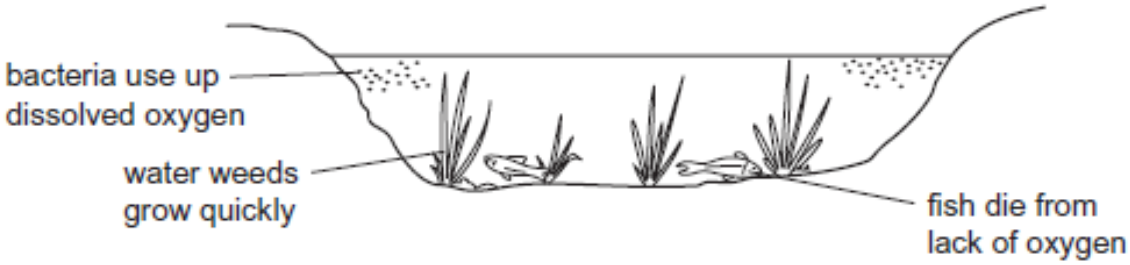
D organic manure

39 A large area is heavily overgrazed for many years.

How does this affect soil nutrients and soil erosion?

	soil nutrients	soil erosion
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

40 The diagram shows some of the effects of human activity on a river.



What could have caused these effects?

A air pollution

B deforestation

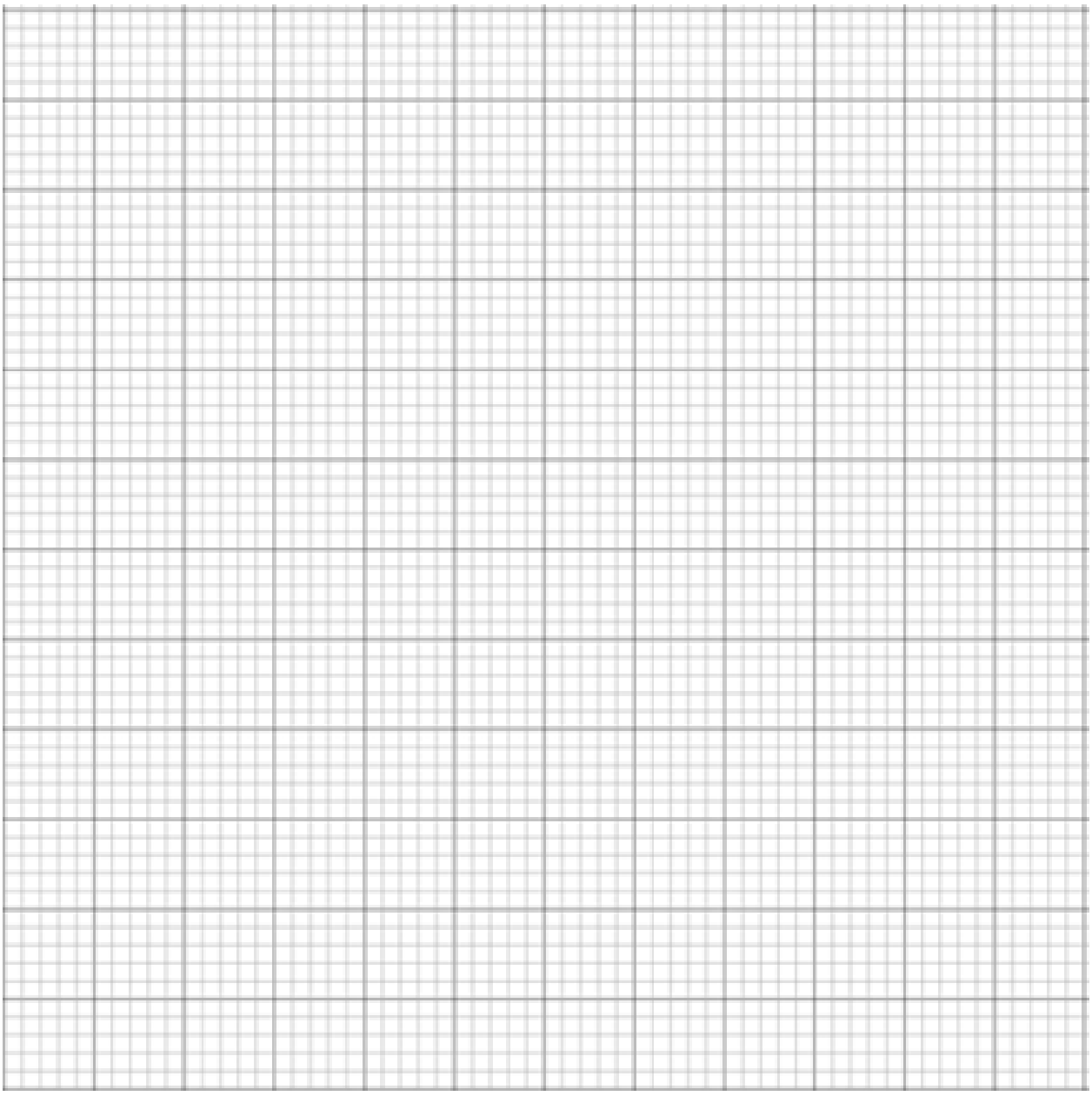
C over-use of fertilisers

D presence of weed killers

41. Describe how you would carry out an experiment to investigate the effect of rising sea temperatures on the growth of coral. Make sure you mention the important variables and how you would make it a "fair test". Do not feel that you have to fill the whole page with writing!

[5]

42. Here are the results of a study on how the fungus *Penicillium* absorbs nutrients and secretes the antibiotic penicillin. Plot these results using the graph paper below.

[5]

Time (hours)	Sugar concentration (g/l)	Penicillin concentration (g/l)
0	100	0
20	58	3
40	15	7
60	4	10
100	3	17