

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**BIOLOGY**

**0610/01**

Paper 1 Multiple Choice

October/November 2004

**45 minutes**

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

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

Do not use staples, paper clips, highlighters, 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.

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.**

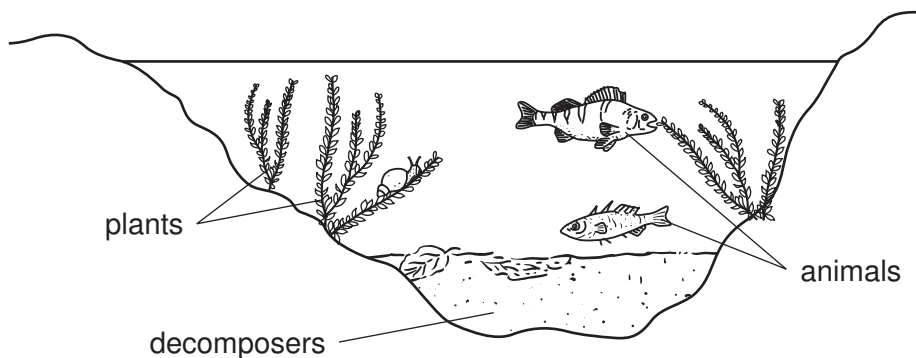
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

This document consists of **15** printed pages and **1** blank page.



- 1 The diagram shows some organisms living in water.

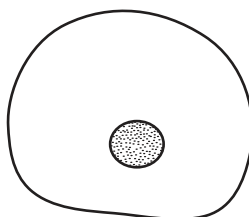


Which process is carried out by all the living organisms shown?

- A photosynthesis
  - B pollination
  - C respiration
  - D transpiration
- 2 An animal has four legs, fur and a tail.
- To which class of vertebrates does it belong?

- A amphibians
- B birds
- C mammals
- D reptiles

- 3 The diagram shows a type of cell.



Using the key below, which letter identifies the cell?

- |   |                                      |          |
|---|--------------------------------------|----------|
| 1 | cell has a nucleus .....             | go to 2  |
|   | cell has no nucleus .....            | go to 3  |
| 2 | cell has a central vacuole .....     | <b>A</b> |
|   | cell has no central vacuole .....    | <b>B</b> |
| 3 | cell has granules inside it .....    | <b>C</b> |
|   | cell has no granules inside it ..... | <b>D</b> |

4 Which part of a plant cell contains cellulose?

- A cell wall
- B chloroplast
- C cytoplasm
- D vacuole

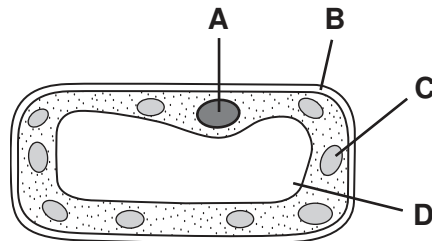
5 The table shows the number of chloroplasts in three different types of leaf cell.

Which shows the correct numbers for each type of cell?

	epidermis	palisade mesophyll	guard cells
<b>A</b>	0	6	17
<b>B</b>	0	17	6
<b>C</b>	6	17	0
<b>D</b>	17	0	6

6 The diagram shows a plant cell.

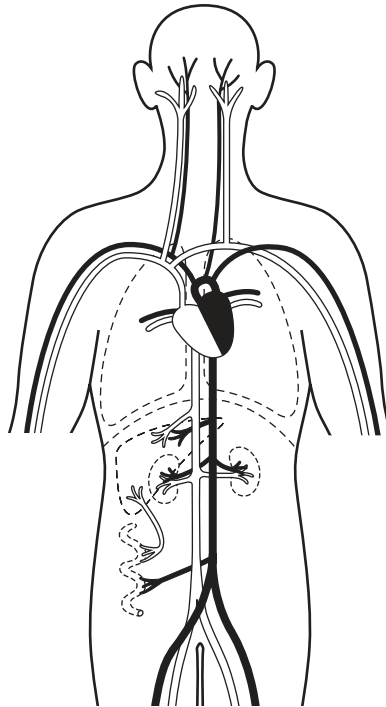
Which part will stain blue/black with iodine solution?



7 Which is an organ?

- A a group of ciliated cells
- B the liver
- C the nervous system
- D the xylem

- 8 The diagram shows some of the blood vessels and other structures in the human body.

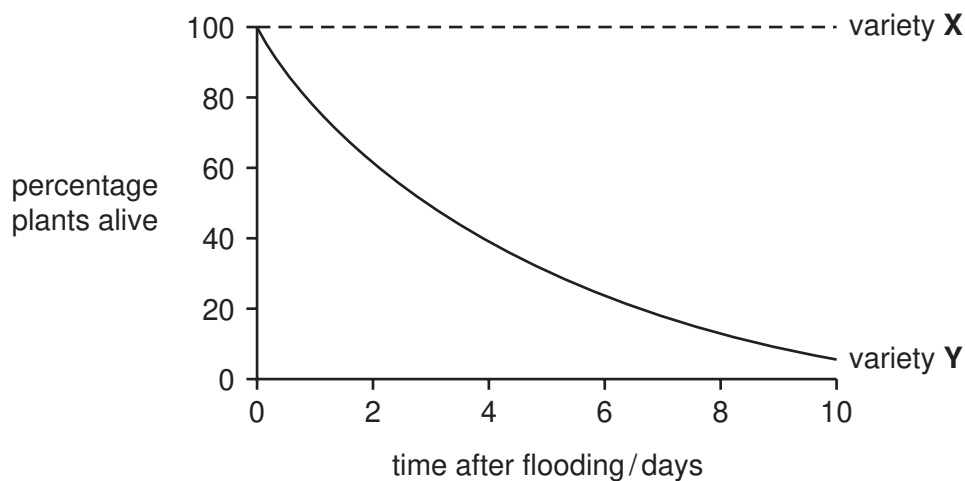


The blood vessels shown are all parts of the same

- A cell.
  - B organ.
  - C organ system.
  - D tissue.
- 9 What causes oxygen to diffuse into the blood from an alveolus (air sac) in the lungs?
- A The oxygen concentration in the alveolus is higher than in the atmosphere.
  - B The oxygen concentration in the alveolus is lower than in the blood.
  - C The oxygen concentration in the atmosphere is higher than the carbon dioxide concentration.
  - D The oxygen concentration in the blood is lower than in the alveolus.

10 A strong solution of salt accidentally flooded a field of young rice plants.

The graph shows the effect on two varieties of rice in the field.



What causes the effect shown by the graph?

- A Water enters the root cells of **X**.
- B Water enters the root cells of **Y**.
- C Water leaves the root cells of **X**.
- D Water leaves the root cells of **Y**.

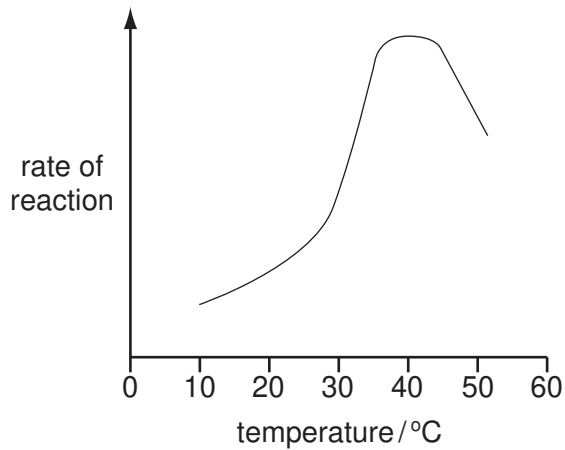
11 Two samples of a human enzyme were used in an experiment. Before they were used

- sample **X** was heated to 80°C and then cooled to 37°C
- sample **Y** was cooled to 0°C and then heated to 37°C.

How will this affect their activity?

- A Sample **X** and sample **Y** are no longer active.
- B Sample **X** and sample **Y** will be equally active.
- C Sample **X** will be more active than sample **Y**.
- D Sample **Y** will be more active than sample **X**.

12 The graph shows the effect of temperature on the digestion of starch.



At which temperature are most starch molecules broken down in one minute?

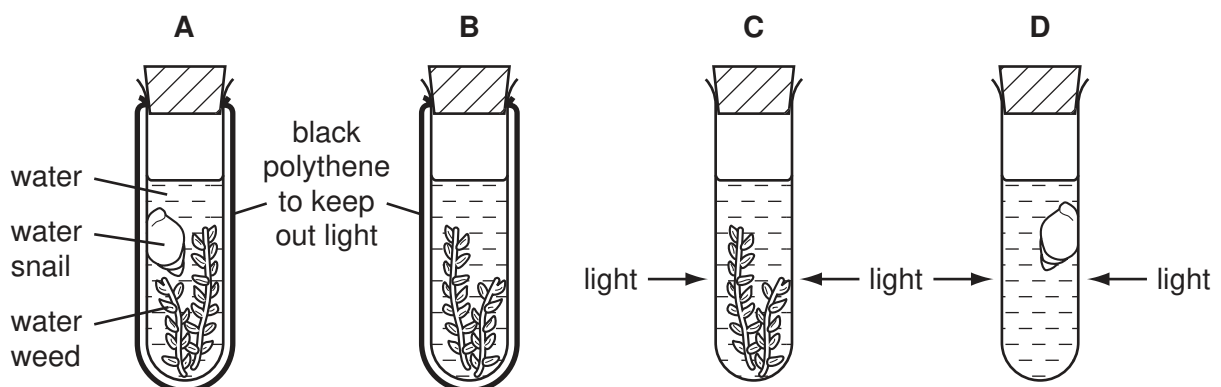
- A** 10°C      **B** 30°C      **C** 40°C      **D** 50°C

13 Which of the following, needed for protein synthesis, is carried into a leaf through the xylem?

- A** carbon dioxide  
**B** nitrate ions  
**C** oxygen  
**D** sugar

14 Four test-tubes are set up as shown.

Which test-tube contains the most carbon dioxide after one hour?



15 What is lacking in the diet of someone with anaemia (haemoglobin deficiency)?

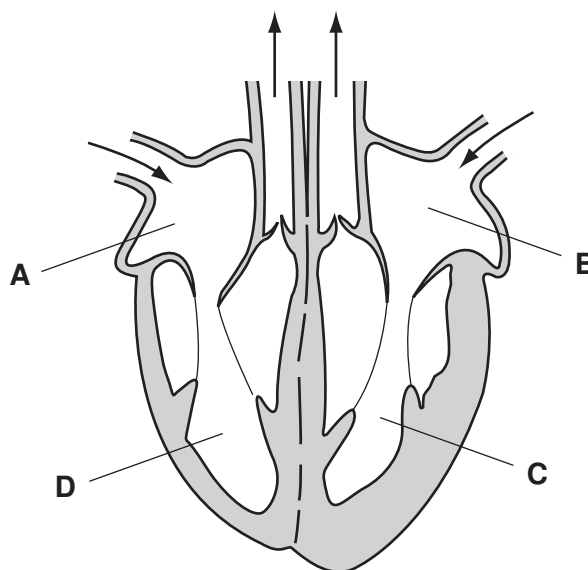
- A calcium
- B iron
- C vitamin C
- D vitamin D

16 By which process is undigested waste material removed from the body?

- A absorption
- B assimilation
- C egestion
- D ingestion

17 The diagram shows the directions of blood flow through a heart.

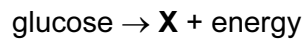
Which chamber of the heart receives blood directly from the lungs?



18 Which of the following describes a vein?

	valves present	thick muscle tissue in wall
A	✓	✓
B	✓	x
C	x	✓
D	x	x

19 Anaerobic respiration in muscles can be summarised by the following equation.



What is **X**?

- A ethanol
- B hydrogen
- C lactic acid
- D water

20 Which component of cigarette smoke is most likely to cause lung cancer?

- A carbon dioxide
- B carbon monoxide
- C nicotine
- D tar

21 How do sweat glands and blood vessels near the skin surface respond when body temperature rises above normal?

	sweat glands	blood vessels near the skin surface
<b>A</b>	decreased activity	constriction
<b>B</b>	decreased activity	dilation
<b>C</b>	increased activity	constriction
<b>D</b>	increased activity	dilation

22 A person has a high-protein diet.

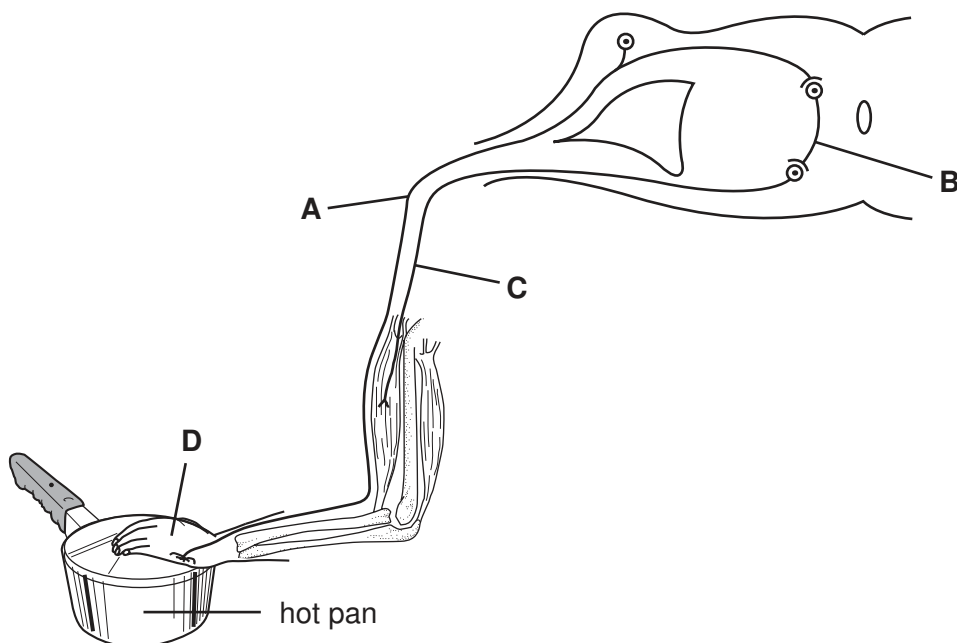
What describes the level of urea in the blood leaving the liver and in the urine leaving the kidneys?

	blood leaving liver	urine leaving kidneys
<b>A</b>	high urea	high urea
<b>B</b>	high urea	low urea
<b>C</b>	low urea	high urea
<b>D</b>	low urea	low urea



23 The diagram shows a reflex arc.

Which label points to the sensory neurone?



24 In which way is the reproduction of a tree assisted by birds eating the fruit of the tree?

- A dispersal
- B fertilisation
- C pollination
- D variation

25 What is the correct sequence of structures involved in a reflex action?

- A effector → sensory neurone → relay neurone → motor neurone → receptor
- B effector → motor neurone → relay neurone → sensory neurone → receptor
- C receptor → sensory neurone → relay neurone → motor neurone → effector
- D receptor → relay neurone → sensory neurone → motor neurone → effector

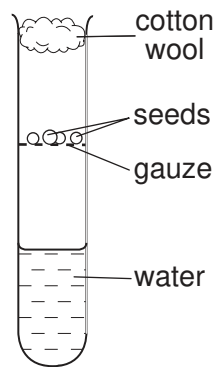
26 Which route does an unfertilised human egg follow through the female reproductive system after being released from the ovary?

- A oviduct → uterus → vagina
- B oviduct → vagina → uterus
- C uterus → oviduct → vagina
- D uterus → vagina → oviduct

27 Which defines the development of an organism?

- A increase in age
- B increase in complexity
- C increase in dry mass
- D increase in height or length

28 Four test-tubes were set up similar to the one shown. Some of the seeds were soaked beforehand.



In which test-tube did the seeds germinate first?

	temperature / °C	seeds
<b>A</b>	5	not soaked
<b>B</b>	5	soaked
<b>C</b>	20	not soaked
<b>D</b>	20	soaked

29 A couple have two daughters and then three sons. They are expecting another child.

What is the chance of this child being a boy?

- A 0%
- B 25%
- C 50%
- D 75%

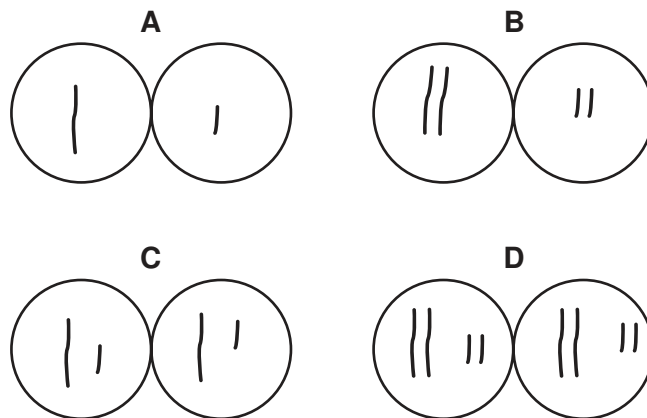
- 30 Which sex chromosomes must be present in sperm and ovum for normal fertilisation leading to the development of a male child?

	sex chromosomes in sperm	sex chromosomes in ovum
<b>A</b>	X	X
<b>B</b>	Y	X
<b>C</b>	XX	XX
<b>D</b>	XY	XX

- 31 The nucleus of a cell contains two pairs of chromosomes.



Which two nuclei are produced after mitosis?



- 32 In fruit flies, the allele for grey body, G, is dominant over the allele for black body, g.

The result of a mating between two flies is shown.

(parents) grey-bodied fly x black-bodied fly



(offspring) 33 grey-bodied flies + 38 black-bodied flies

What were the genotypes of the parents?

- A** Gg x gg      **B** Gg x Gg      **C** GG x gg      **D** GG x Gg

33 Which of the following is an example of a food chain?

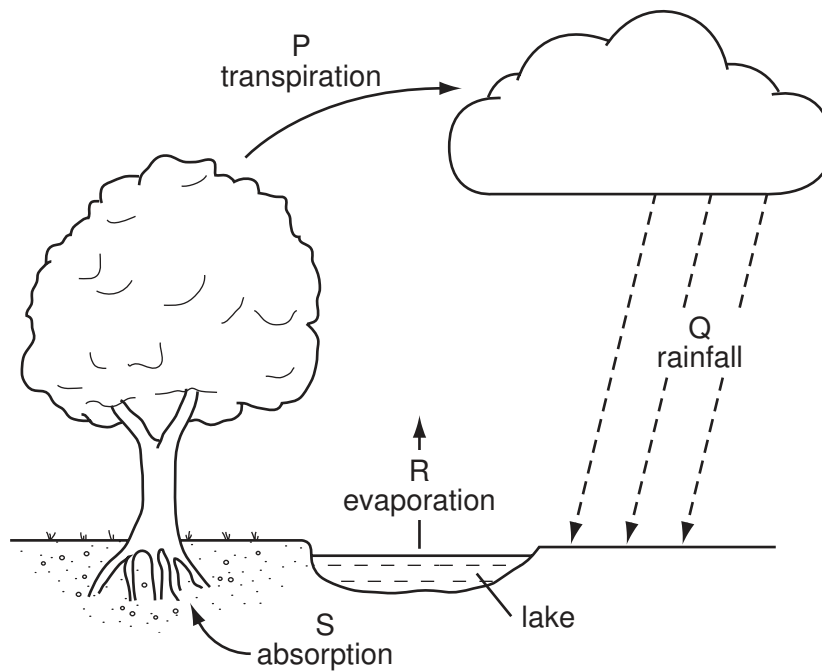
- A carbohydrate → fat → protein
- B flower → fruit → seed
- C grass → antelope → lion
- D ingestion → assimilation → excretion

34 The surface waters of the ocean contain a population of microscopic plants (plankton).

Which factor would result in **fewer** of these plants?

- A an increase in the population of microscopic animals
- B greater concentration of mineral nutrients
- C more light
- D warmer ocean water

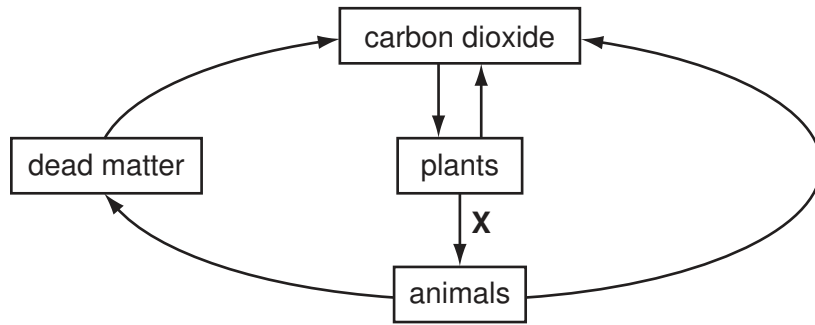
35 The diagram shows part of the water cycle.



Which processes will be slowed down by an increase in humidity?

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

36 The diagram shows part of the carbon cycle.

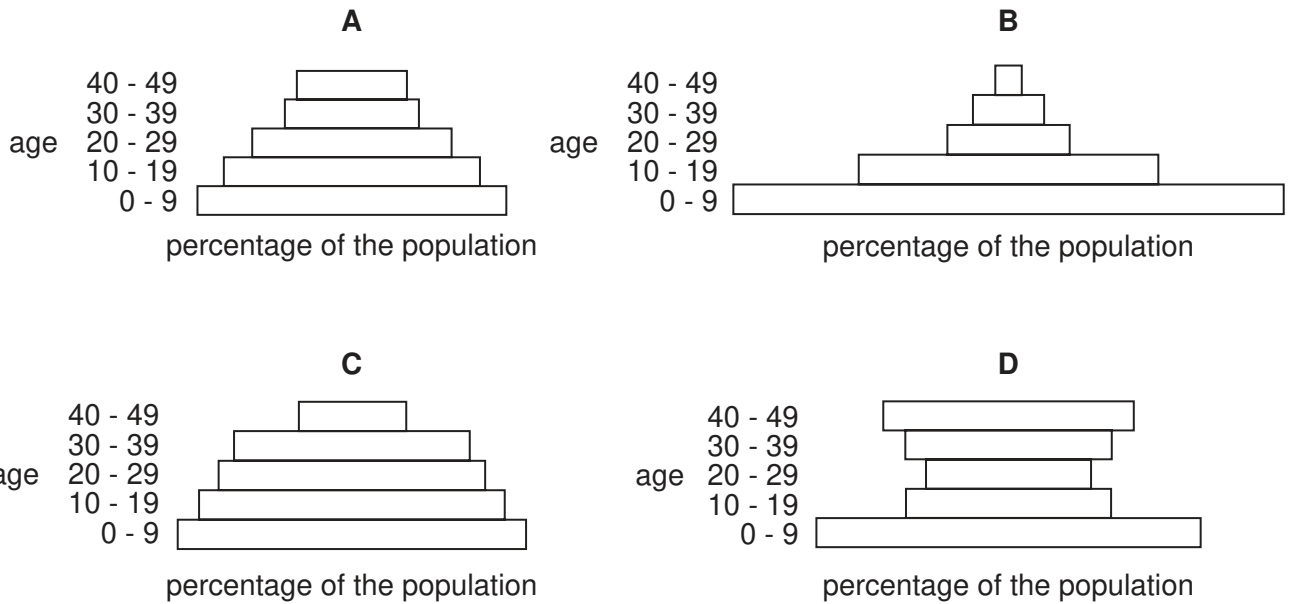


What does arrow **X** represent?

- A decay
- B nutrition
- C photosynthesis
- D respiration

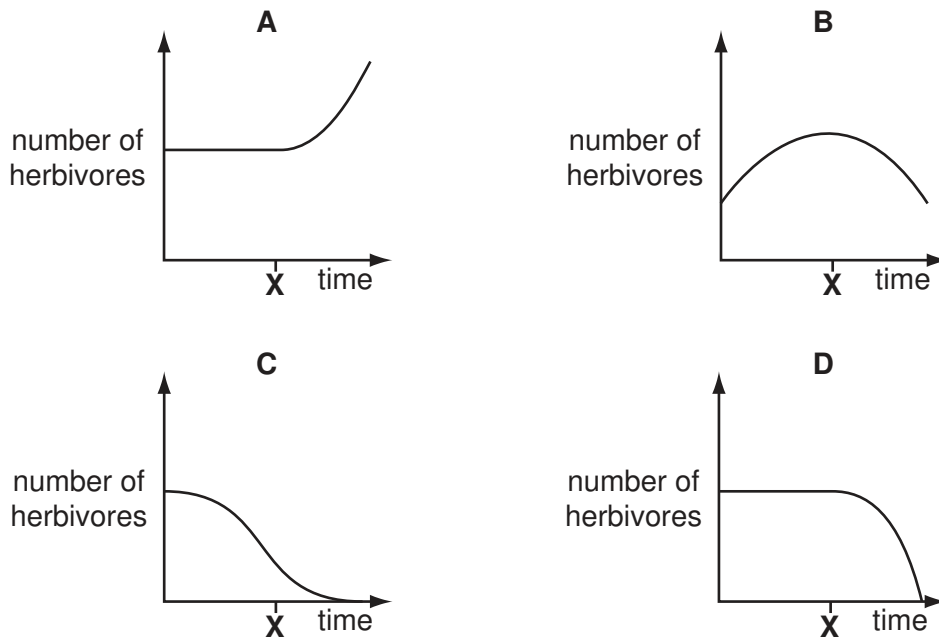
37 The diagrams show the current population sizes for people below 50 years of age in four different countries.

Which country will be likely to have the largest population of people 60 – 70 years of age in 20 years time?



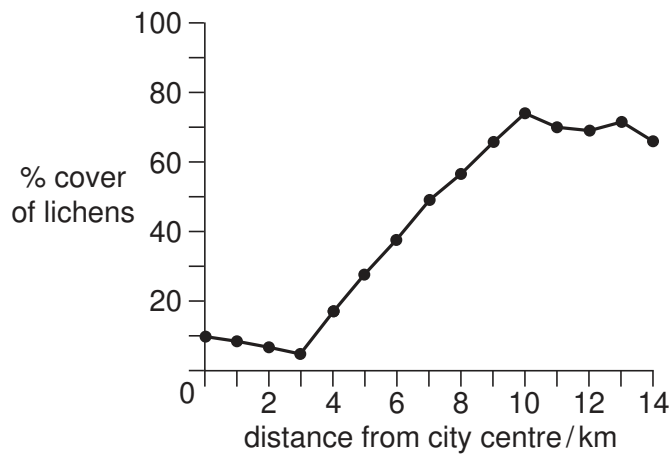
38 The graphs show the number of herbivores in a habitat over a period of time. At time X the carnivores are removed from the habitat.

Which graph shows the effect of this on the number of herbivores?



39 Lichens are living organisms that grow on trees. Air pollution slows down the growth of lichens.

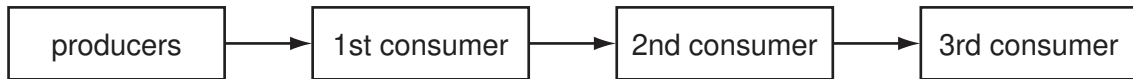
The graph shows the average percentage of each tree covered by lichens at different distances from a city centre.



At which distance from the city centre is the air most polluted?

- A 0 km      B 3 km      C 10 km      D 14 km

40 An insecticide sprayed on a crop washes into a lake in which there is the following food chain.



What are the most likely levels of the insecticide in the tissues of the organisms?  
(ppm = parts per million.)

	producer /ppm	1st consumer /ppm	2nd consumer /ppm	3rd consumer /ppm
<b>A</b>	26.4	0.04	2.0	0.5
<b>B</b>	0.04	0.5	2.0	26.4
<b>C</b>	26.4	2.0	0.5	0.04
<b>D</b>	0.5	26.4	0.04	2.0

