Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **February/March 2017**

45 minutes

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

7903107076

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

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1 The drawing shows a ground squirrel.



Which feature identifies this animal as a mammal?

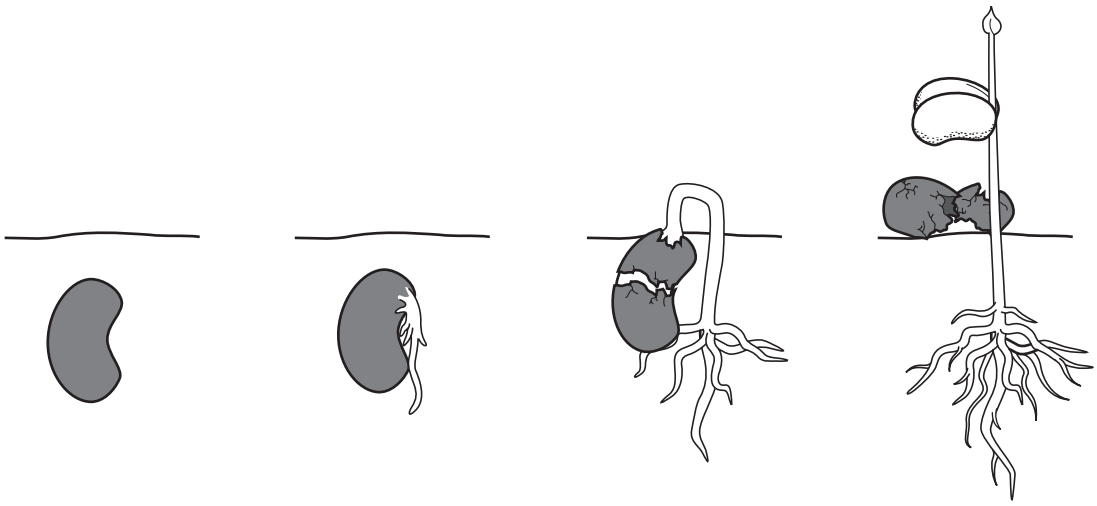
A eye

B four limbs

C fur

D tail

2 The diagram shows how a seed changes after it is planted in soil and watered.



Which characteristics of living things are demonstrated by this sequence?

A excretion and growth

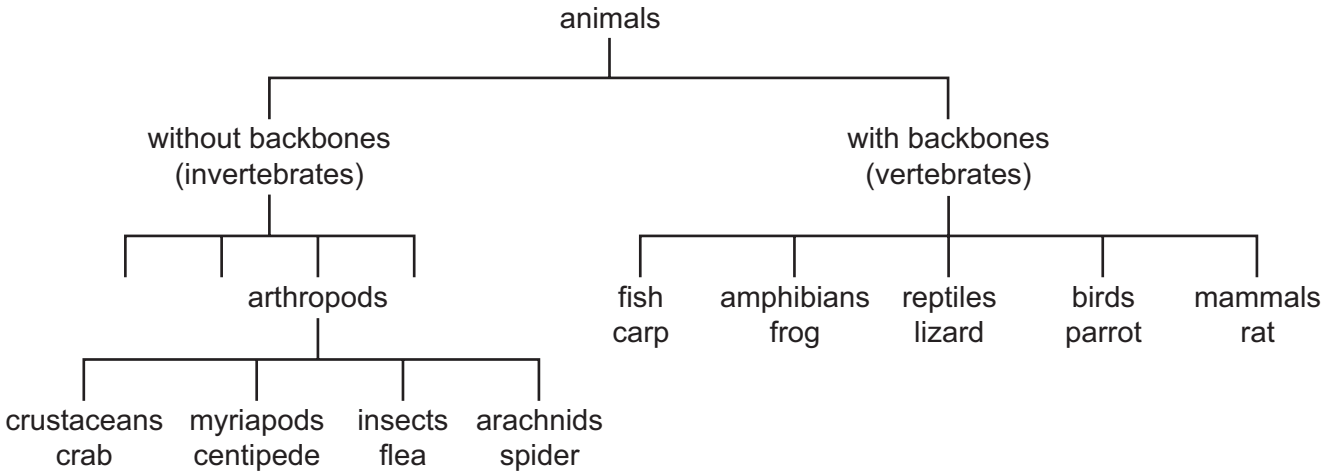
B growth and sensitivity

C nutrition and reproduction

D nutrition and sensitivity

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3 The diagram shows part of the classification of the animal kingdom with an example of each group.



Which pair of animals have the most recent common ancestor as suggested by the classification?

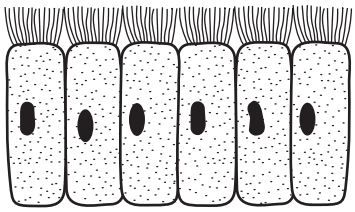
A centipede and carp

B flea and frog

C lizard and parrot

D spider and rat

4 The diagram shows a sample of material taken from an organism.



Which level of organisation does the sample show?

A cell

B organ

C organ system

D tissue

5 The length of a specimen in a photograph is 45 mm. Its actual length is 25 mm.

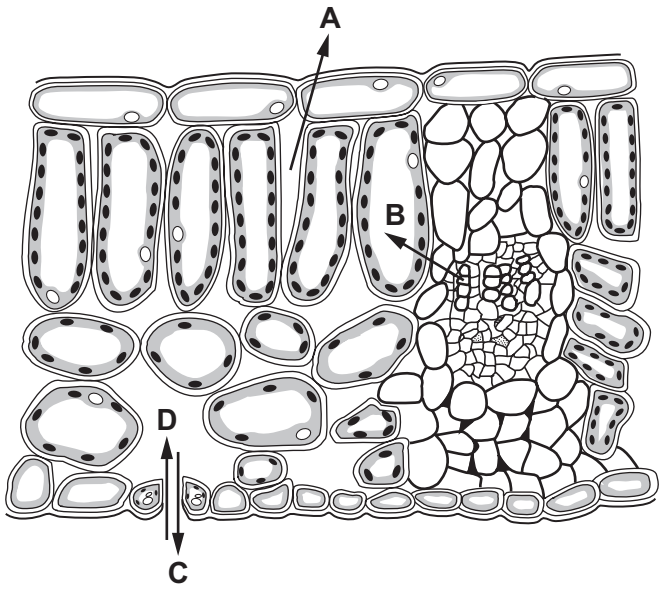
What is the magnification of the photograph?

A ×0.6 **B** ×1.6 **C** ×1.8 **D** ×1125

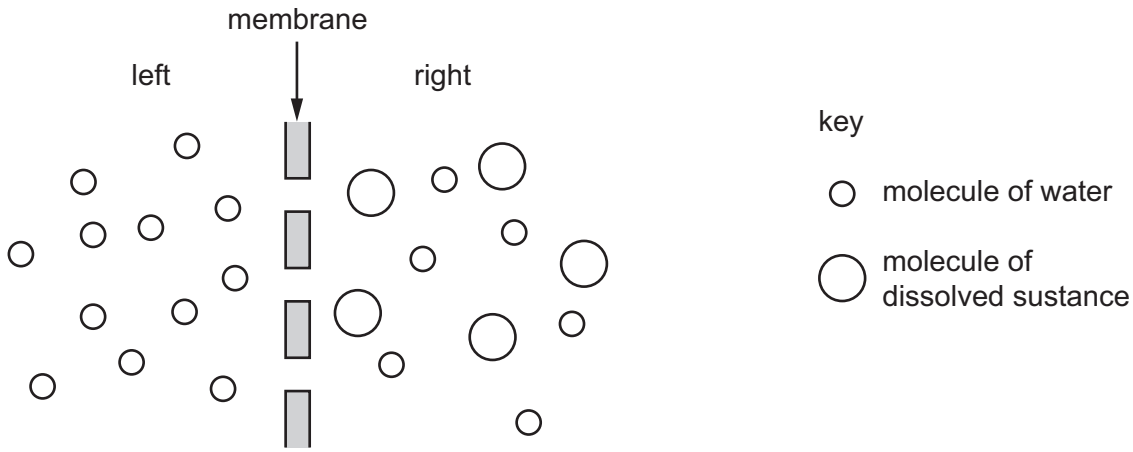
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6 The diagram shows a section through a leaf.

Which arrow shows the direction of diffusion of carbon dioxide on a sunny day?



7 The diagram represents two liquids, separated by a membrane through which osmosis can occur.



Which statement describes how the molecules will move?

A Molecules of dissolved substance move from left to right.

B Molecules of dissolved substance move from right to left.

C Overall, water molecules move from left to right.

D Overall, water molecules move from right to left.

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8 Which element is found in proteins but **not** carbohydrates?

A carbon

B hydrogen

C nitrogen

D oxygen

9 Many enzymes do not work at temperatures above 60 °C.

Which statement explains this?

A Product molecules are not made because the active site has changed shape.

B Product molecules change shape so they do not fit the active site.

C Substrate molecules are moving too fast.

D Substrate molecules are moving too slowly.

10 Which substances are used for photosynthesis?

A carbon dioxide and glucose

B carbon dioxide and water

C glucose and oxygen

D glucose and water

11 Which term is defined as the taking of substances into the body through the mouth?

A absorption

B assimilation

C digestion

D ingestion

12 Which nutrient is deficient in the diet of a child with kwashiorkor?

A calcium

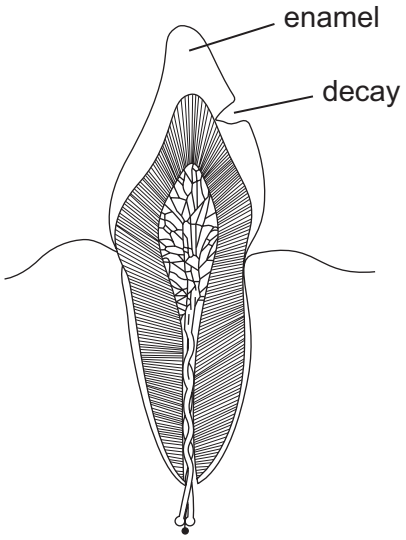
B iron

C protein

D vitamin D

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13 The diagram shows a tooth with signs of decay.



What has made the hole in the enamel of the tooth?

A acid

B saliva

C sugar

D toothpaste

14 Which is a description of translocation?

A movement of amino acids and sucrose from sink to source

B movement of amino acids and sucrose from source to sink

C movement of water down a water potential gradient

D movement of water up a water potential gradient

15 Which is a function of the lymphatic system?

A deamination of amino acids

B production of lipase

C protection from infection

D transport of oxygen

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16 A hospital patient who is feeling unwell is given a blood test.

The results of the blood test show a very low level of platelets.

What effect will this have?

A The blood will be unable to transport nutrients, hormones and carbon dioxide.

B The blood will not be able to carry as much oxygen to the tissues as normal.

C There will be a greater risk of bleeding because the blood will take longer to clot.

D There will be a greater risk of infection because the blood cannot make antibodies.

17 What is a common feature of both active and passive immunity?

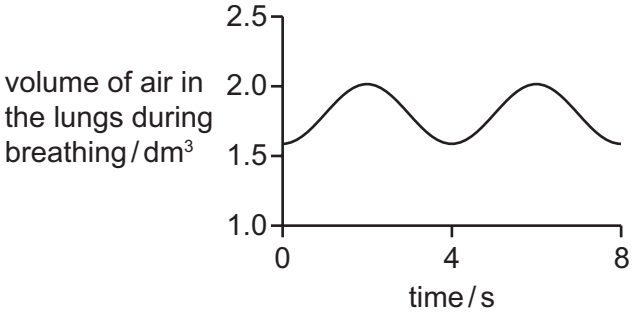
A They are acquired by vaccination.

B They are always short-term.

C They involve the activity of memory cells.

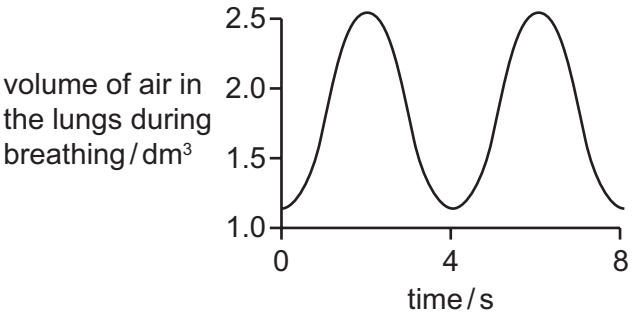
D They involve antibodies.

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

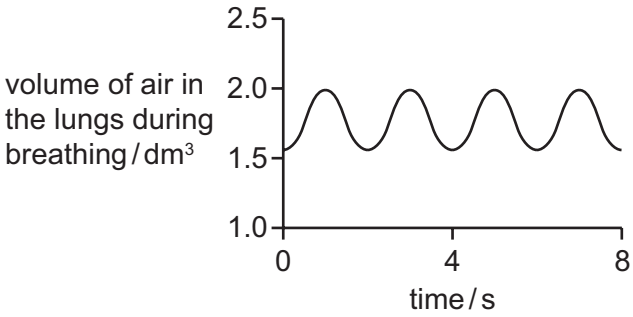


Which graph shows the rate and depth of breathing of the same person immediately after a period of exercise?

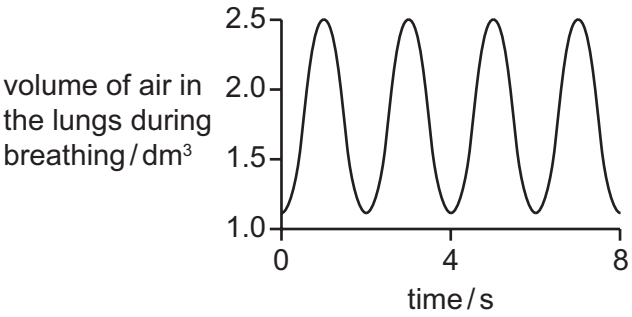
A



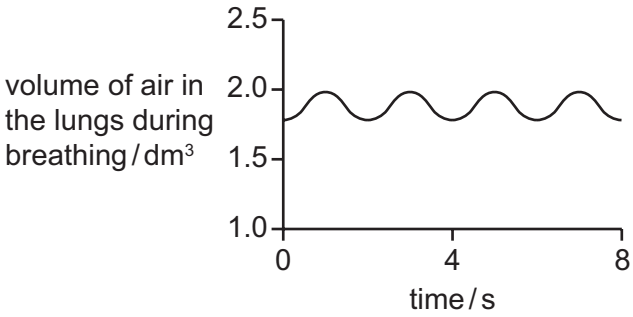
B



C

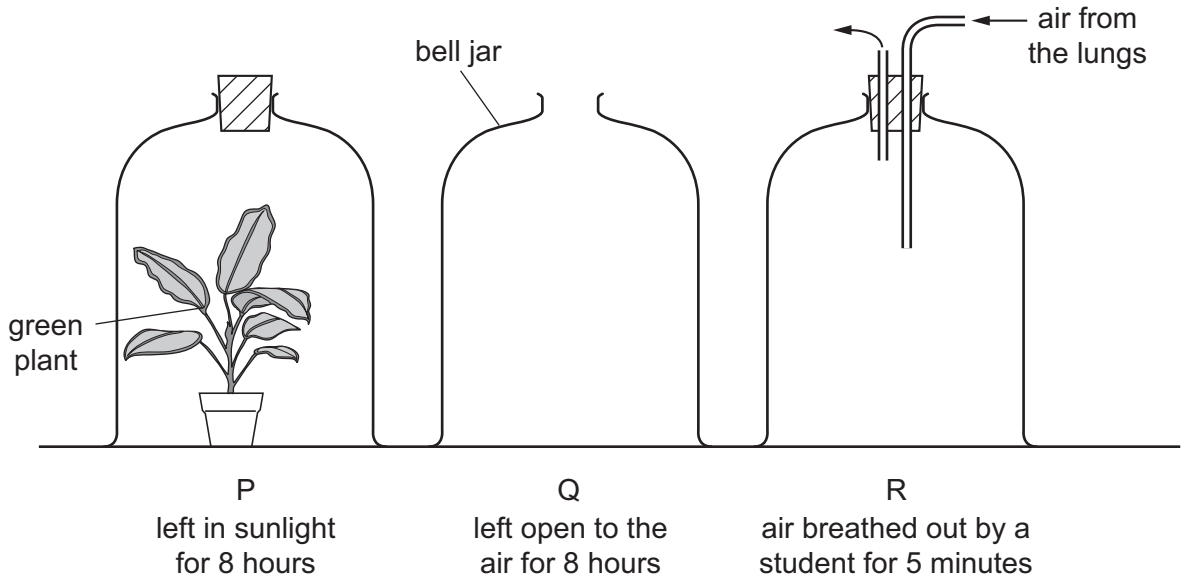


D



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19 In an experiment, three glass bell jars were set up as shown in the diagram.



At the end of the experiment, which bell jar has the most oxygen and which has the least?

	most oxygen	least oxygen
A	P	Q
B	P	R
C	Q	P
D	R	P

20 What are the products of anaerobic respiration in muscles?

A ethanol and carbon dioxide

B ethanol only

C lactic acid and carbon dioxide

D lactic acid only

21 Which substance remains in the blood as it passes through the kidney?

A protein

B salts

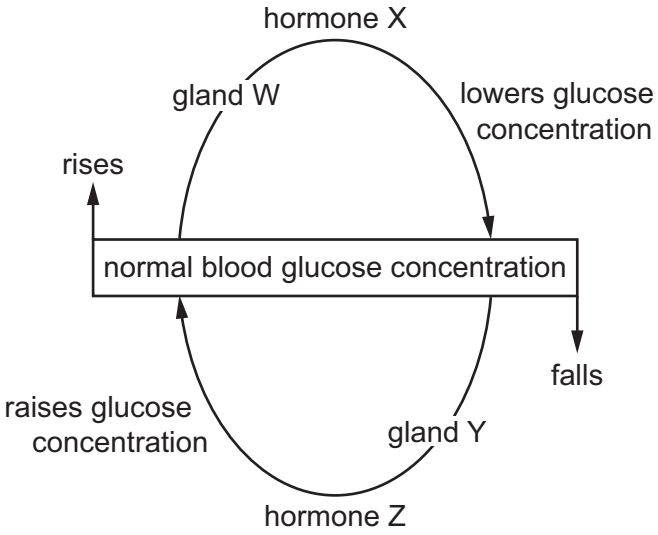
C urea

D water

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[Turn over

22 The diagram shows the mechanisms that control the concentration of glucose in the blood.



Which row identifies the glands and hormones labelled W, X, Y and Z?

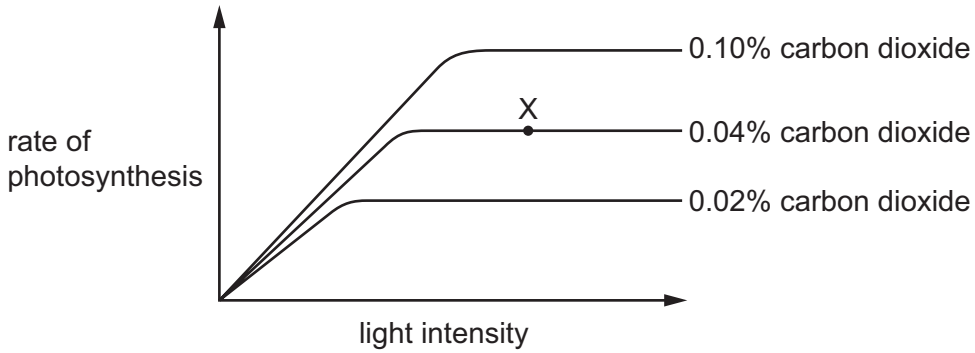
	gland W	hormone X	gland Y	hormone Z
A	adrenal gland	adrenaline	adrenal gland	glucagon
B	adrenal gland	adrenaline	pancreas	insulin
C	pancreas	glucagon	adrenal gland	insulin
D	pancreas	insulin	pancreas	glucagon

23 Which row shows the effects of increased adrenaline release?

	breathing rate	pulse rate	pupil
A	decreases	increases	widens
B	increases	decreases	widens
C	increases	increases	narrows
D	increases	increases	widens

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24 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

25 What is an advantage of asexual reproduction for a population of flowering plants in the wild?

A A disease is less likely to affect the whole population.

B Large numbers of offspring can be produced quickly.

C Pollen can easily be transferred within the same flower.

D The offspring show genetic variety.

26 During sexual reproduction in plants, what will give rise to the greatest variation in the offspring?

A All of the flowers on the same plant have male and female reproductive organs.

B The anthers and stigmas on the same plant mature at the same time of year.

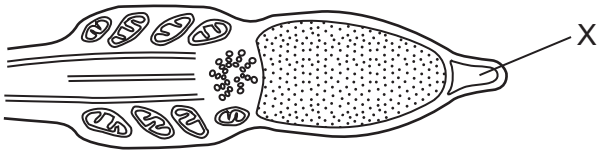
C There are separate male and female flowers on the same plant.

D There are separate male and female plants.

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[Turn over

27 The diagram shows the head of a sperm.



What is the function of structure X?

A It carries genetic information.

B It controls the activities of the sperm cell.

C It is involved in the digestion of the ovum cell membrane.

D It provides energy for movement.

28 Which hormone is given to women undergoing fertility treatment?

A adrenaline

B FSH

C insulin

D oestrogen

29 The diagram represents the fusion of sperm and ovum at fertilisation.



Which description of cell X is correct?

A diploid gamete

B diploid zygote

C haploid gamete

D haploid zygote

30 A cell with 16 chromosomes divides twice by mitosis.

How many chromosomes does each of the resulting cells contain?

A 4 **B** 8 **C** 16 **D** 32

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31 A man of genotype I^AI^o and woman of genotype I^BI^o have a child.

What is the chance that the child will have the same blood group as one of its parents?

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

32 Which human phenotype is affected by environmental and genetic factors?

A blood group

B body size

C gender

D tongue rolling

33 Which adaptation may be present in a xerophyte?

A leaves with small surface area and large numbers of stomata

B little or no xylem tissue and leaves with large surface area

C stomatal hairs and rolled leaves

D thin or no cuticle and deep roots

34 How does artificial selection differ from natural selection?

A Selection changes the characteristics of living things.

B Selection is based on genetic variation.

C Selection is not based on adaptation to their environment.

D Selection occurs over many generations.

35 The diagram shows the energy present in a food chain.

40 000 kJ		4000 kJ		400 kJ		40 kJ
photosynthesising phytoplankton	→	krill	→	herring	→	bass

What percentage of energy present in the producer is transferred to the secondary consumer?

A 0.01% **B** 0.1% **C** 1% **D** 10%

36 Which process results in the loss of nitrates from soils?

A deamination

B decomposition

C denitrification

D nitrification

37 During the exponential (log) phase of a sigmoid growth curve, which factor limits population growth?

A availability of food

B build-up of wastes

C presence of disease

D rate of reproduction

38 Genes are isolated from human DNA using ……1…… enzymes.

A bacterial plasmid is cut with the same enzyme forming ……2…… .

The human DNA is inserted into the bacterial plasmid using the enzyme ……3…… forming a

……4…… plasmid.

Which row correctly completes gaps 1, 2, 3 and 4?

	1	2	3	4
A	ligase	sticky ends	protease	restriction
B	recombinant	new DNA	ligase	daughter
C	restriction	daughter plasmids	ligase	diploid
D	restriction	sticky ends	ligase	recombinant

39 How does cutting down trees contribute to the greenhouse effect?

A There will be less carbon dioxide absorbed.

B There will be less oxygen absorbed.

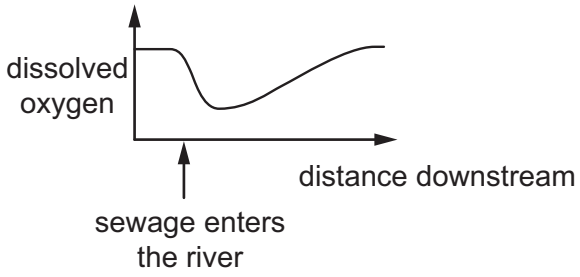
C There will be less shade from trees.

D The soil will become dry.

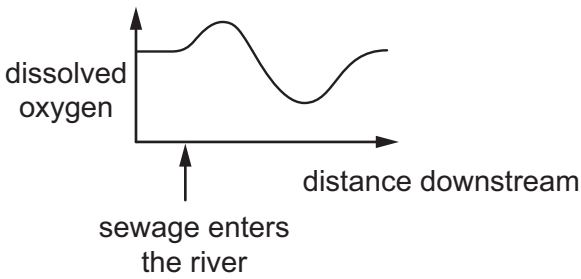
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40 Which graph shows the effect of pollution by untreated sewage on the amount of oxygen dissolved in a river?

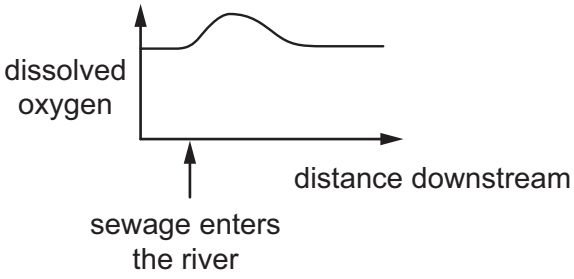
A



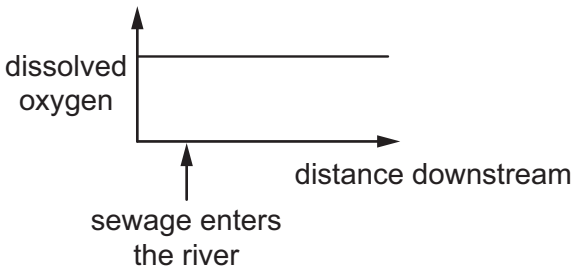
B



C



D



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