UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY **0610/12**

Paper 1 Multiple Choice **October/November 2012**

45 minutes

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

* 4 2 0 1 2 6 7 4 1 6 *

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.
Electronic calculators may be used.

IB12 11_0610_12/3RP
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1 Which are characteristics of insects?

	have six legs	have two body sections
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

2 A student observed a vertebrate swimming in a pond. The animal's surface was smooth and hairless. It used its four legs to swim. At intervals, the animal came to the surface to take mouthfuls of air.

To which vertebrate class does this animal belong?

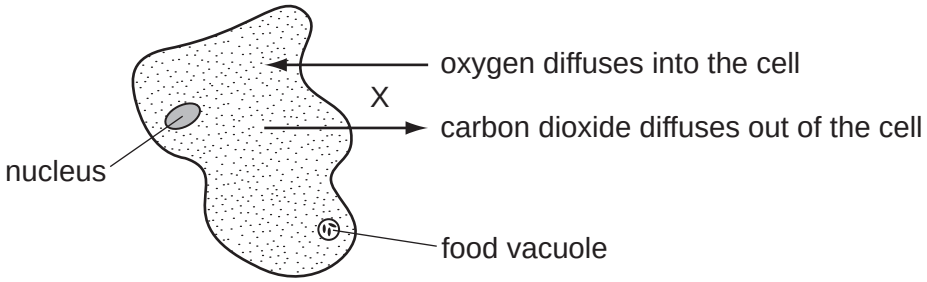
A amphibians

B fish

C mammals

D reptiles

3 The diagram shows an amoeba, a single-celled living organism.



The movement of gases at X indicates the occurrence of which process or processes in the cell?

A excretion and nutrition

B excretion and respiration

C nutrition and respiration

D respiration only

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4 The picture shows an animal.



What is the name of this animal according to the **binomial system**?

A *catus*

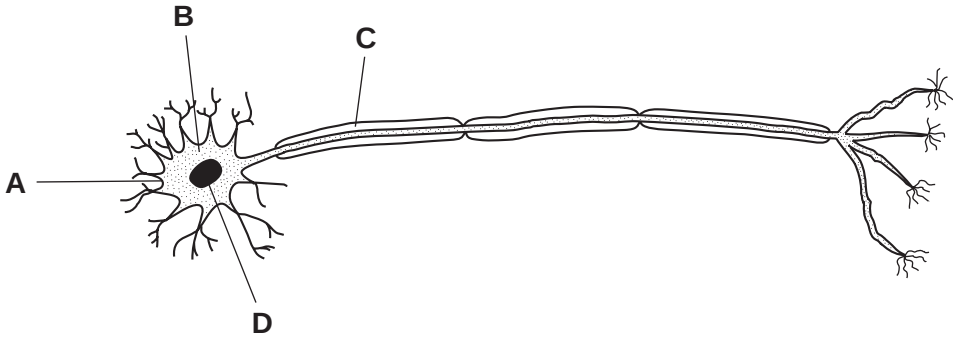
B male African lion

C *Panthera leo*

D top African carnivorous cat

5 The diagram shows a motor (effector) neurone.

Which structure is also found in white blood cells, but **not** in red blood cells?



6 At what level of organisation is a leaf?

A organ

B organism

C organ system

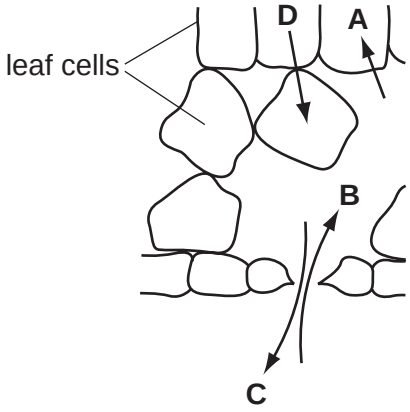
D tissue

7 Which structures are found in a liver cell?

	cell membrane	cell wall	chloroplast	large vacuole	cytoplasm	nucleus
A	✓	✓	×	×	×	×
B	×	×	✓	✓	×	×
C	✓	×	×	×	✓	✓
D	×	✓	×	×	×	✓

8 The diagram shows part of a section through a leaf.

Which arrow shows the direction of movement of water by osmosis in a leaf?



9 Osmosis is defined as the diffusion of water molecules

A down their concentration gradient through a partially permeable membrane.

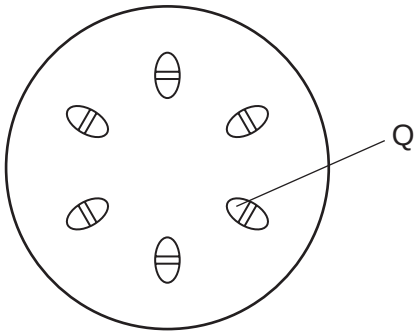
B down their concentration gradient through a permeable membrane.

C up their concentration gradient through a partially permeable membrane.

D up their concentration gradient through a permeable membrane.

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10 The diagram shows a cross-section through a plant stem.



Q shows the part that is stained red when the stem is placed in water containing a red dye.

What is found at Q?

A guard cells

B palisade cells

C phloem

D xylem

11 What could increase the rate of water uptake by a shoot?

A covering the shoot with a black plastic bag

B covering the shoot with a clear plastic bag

C removing the leaves from the shoot

D shining a bright light onto the shoot

12 Some plants digest insects and use the nutrients for growth.

What must these plants produce to digest the insects?

A acids

B alkalis

C enzymes

D hormones

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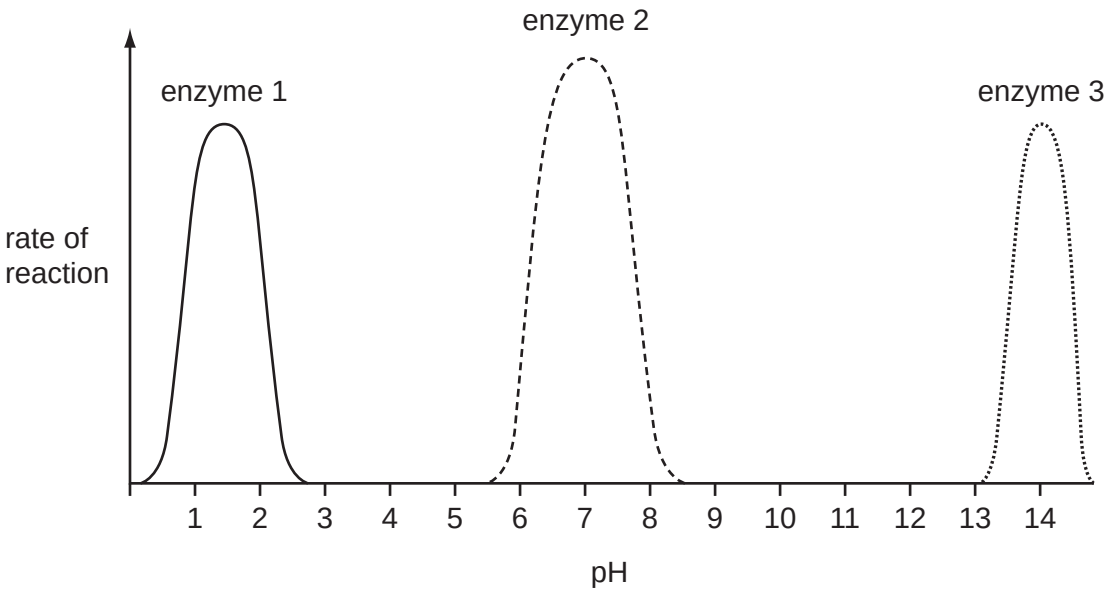
13 When solution X is tested with iodine solution, a blue-black colour is observed.

A different solution, Y, is added to a new sample of solution X and the mixture is shaken and left for 30 minutes at 40 °C. When tested with iodine solution, an orange-brown colour is observed.

What are solutions X and Y?

	X	Y
A	maltose	amylase
B	maltose	lipase
C	starch	amylase
D	starch	lipase

14 The graph shows the effect of pH on the rate of reaction of three different enzymes.



What does the graph show?

A Each enzyme works best at a different pH.

B Each enzyme works best over a narrow temperature range.

C Enzymes work best in acid conditions.

D Enzymes work best in alkaline conditions.

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15 What shows the sequence of organs through which urea passes as it travels from where it is produced to where it is removed from the blood?

A kidneys → heart → lungs → heart → liver

B kidneys → heart → liver → lungs → heart

C liver → heart → lungs → heart → kidneys

D liver → lungs → heart → kidneys → heart

16 A child decided to eat only meat, oily fish, cheese and bread, and drink only water.

Which nutrient would be in low levels in this diet?

A calcium

B iron

C vitamin C

D vitamin D

17 What has **not** increased the world's food production in the last 100 years?

A artificial selection

B herbicides

C natural selection

D pesticides

18 The table shows the percentage composition of three gases in atmospheric air.

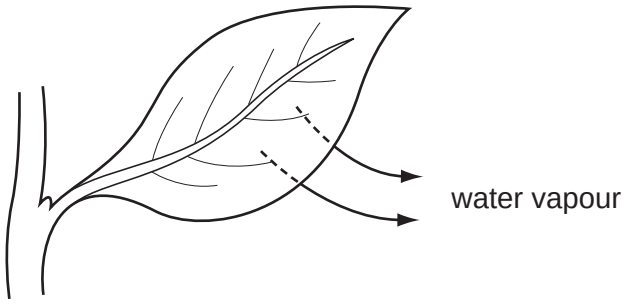
oxygen	carbon dioxide	nitrogen
21	0.04	78

What is the composition of the air breathed out by a person?

	oxygen / %	carbon dioxide / %	nitrogen / %
A	5	73	20
B	16	4	78
C	21	0.04	78
D	78	2	20

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19 The diagram shows how water is lost from a leaf.



By which process is the water lost?

A osmosis

B photosynthesis

C translocation

D transpiration

20 What is produced by anaerobic respiration in a muscle?

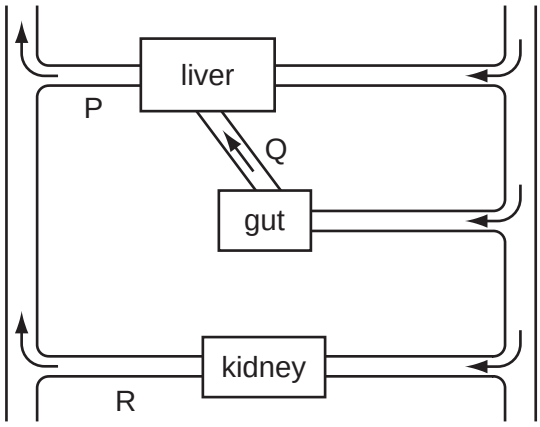
	lactic acid	carbon dioxide
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = produced

✗ = not produced

21 The diagram represents some human organs and their blood vessels.

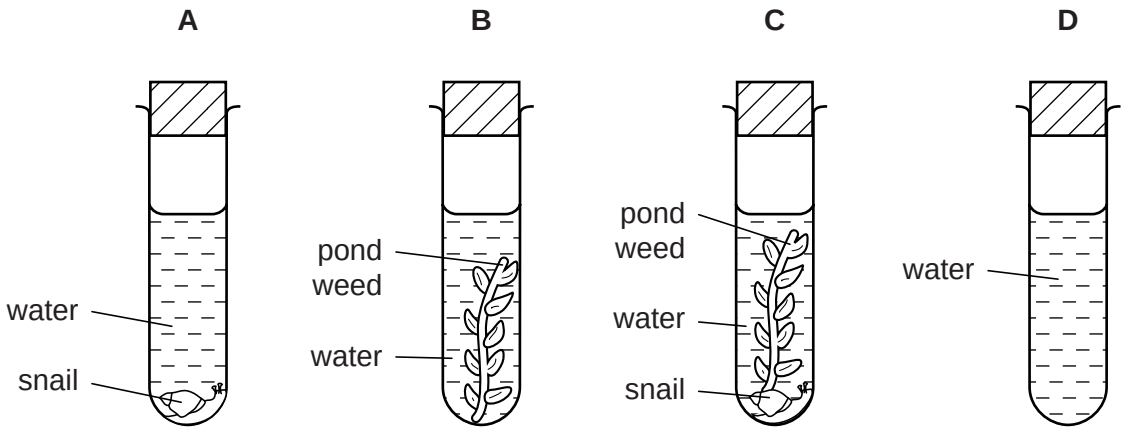


Immediately after taking an alcoholic drink, how would the levels of alcohol compare in blood vessels P, Q and R?

	P	Q	R
A	high	medium	high
B	medium	high	low
C	low	low	medium
D	high	low	low

22 Four test-tubes were set up as shown in the diagram and left in full sunlight.

After several hours, which test-tube would contain the most dissolved carbon dioxide?



23 A healthy person eats a very high-protein diet.

What effect will this have on their urine?

A It will contain amino acids.

B It will contain glucose.

C It will contain more urea.

D It will contain more water.

24 During a long race, an athlete's skin temperature rises.

What causes this?

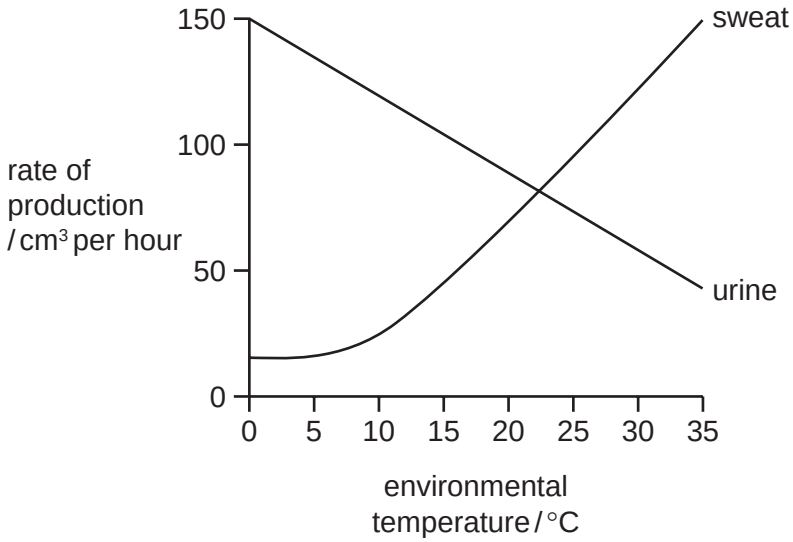
A increased sweating

B opening of the pores in the skin

C vasoconstriction of the blood vessels in the skin

D vasodilation of the blood vessels in the skin

25 The graph shows the rates of sweat production and urine production at different environmental temperatures.



Which statement is correct?

A As the temperature increases, the rate of sweat production decreases.

B At 22 °C the rates of sweat and urine production are the same.

C Urine and sweat production are directly proportional to environmental temperature.

D When the urine production decreases, the sweat production decreases.

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26 A man injures his arm in an accident. Afterwards, he can feel objects touching his hand, but he cannot move his hand away from them.

What could cause this?

A Receptors in his hand are damaged.

B The nerve connection is cut only between the receptors in his hand and his central nervous system.

C The nerve connection is cut only between his central nervous system and the effectors in his arm.

D Both of these nerve connections are cut.

27 The table lists some processes which take place during reproduction in flowering plants and mammals.

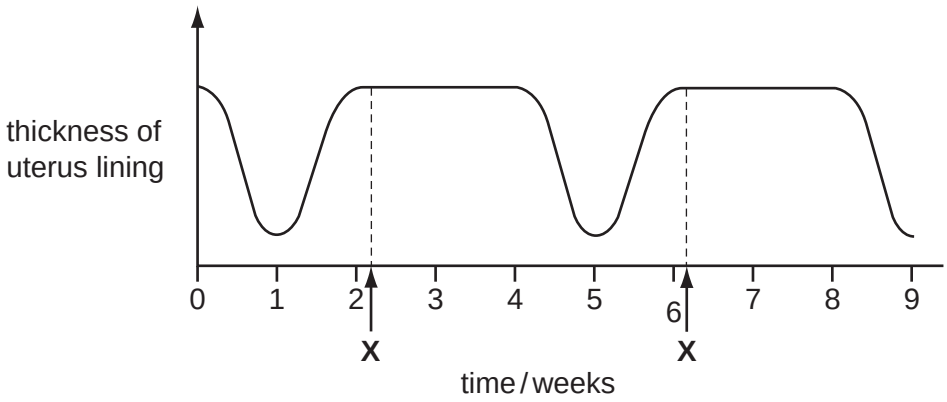
Which row is correct?

	fertilisation needed	implantation needed	pollination needed
A	flowering plants and mammals	mammals only	flowering plants only
B	flowering plants and mammals	flowering plants and mammals	mammals only
C	mammals only	mammals only	flowering plants only
D	flowering plants and mammals	mammals only	flowering plants and mammals

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[Turn over

28 The graph shows changes in the thickness of the uterus lining of a woman.



What happens each time at **X**?

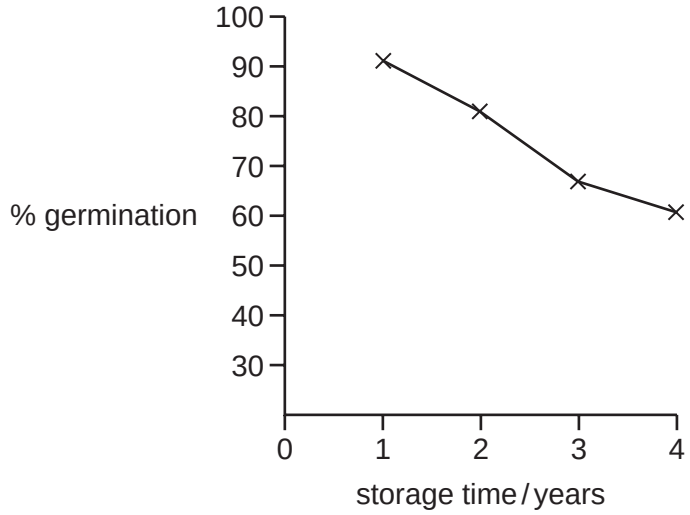
A fertilisation

B implantation

C menstruation

D ovulation

29 The graph shows the effect of storage time on the germination of some seeds.



What can be concluded from this graph?

A Older seeds do not germinate.

B Older seeds germinate better than younger seeds.

C Younger seeds always germinate.

D Younger seeds germinate better than older seeds.

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30 How does a haploid nucleus differ from a diploid nucleus of the same species?

A It has different genes.

B It has fewer chromosomes.

C It has more alleles.

D It is the result of fertilisation.

31 A pure-breeding white mouse was crossed with a pure-breeding black mouse. All their offspring were black.

Then, one of the offspring was bred with a pure-breeding white mouse. They produced 10 baby mice.

What are the most likely colours of these mice?

A 5 black and 5 white

B 8 white and 2 black

C 10 black

D 10 white

32 Which process forms part of both the carbon and water cycles?

A condensation

B fossilisation

C photosynthesis

D transpiration

33 The diagram shows a food chain.

mahogany tree → caterpillar → small bird → owl

In this food chain, which population has the largest biomass and which has the largest population size?

	largest biomass	largest population size
A	owl	mahogany tree
B	owl	small bird
C	mahogany tree	caterpillar
D	mahogany tree	owl

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[Turn over

34 There is evidence that the concentration of carbon dioxide in the Earth's atmosphere is increasing.

Which change could explain this?

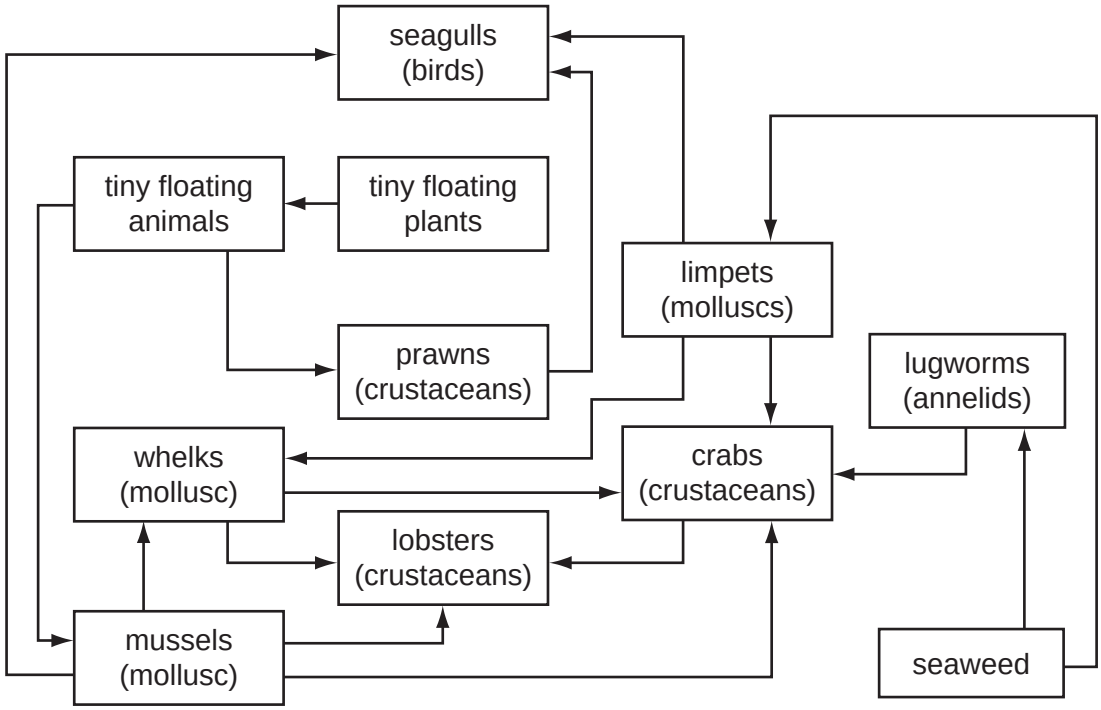
A less combustion of fossil fuels

B more combustion of stored carbon compounds from dead organisms

C more photosynthesis by plants

D people breathing faster

35 The diagram shows a food web near a sea shore.



Which animals have the most varied food, as shown in **this** food web?

A crabs

B limpets

C lobsters

D seagulls

36 In the carbon cycle, what is the simple substance absorbed by producers?

A carbohydrate

B carbon dioxide

C nitrate

D protein

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37 Which human activity can cause eutrophication of lakes?

A releasing carbon dioxide

B releasing sulfur dioxide

C using fertilisers

D using pesticides

38 Insecticides sprayed in low concentrations may increase the yield of a crop, but may also be harmful to wildlife.

What is an explanation for this?

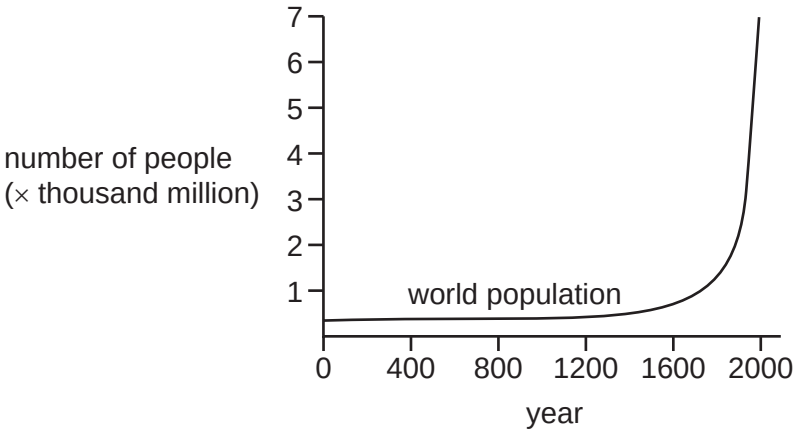
A Insecticides cause acid rain.

B Insecticides enter the food chain.

C Insecticides increase the nitrates in soil.

D Insecticides kill other plants.

39 The graph shows the growth of the human population of the world.



Between which years did the population grow fastest?

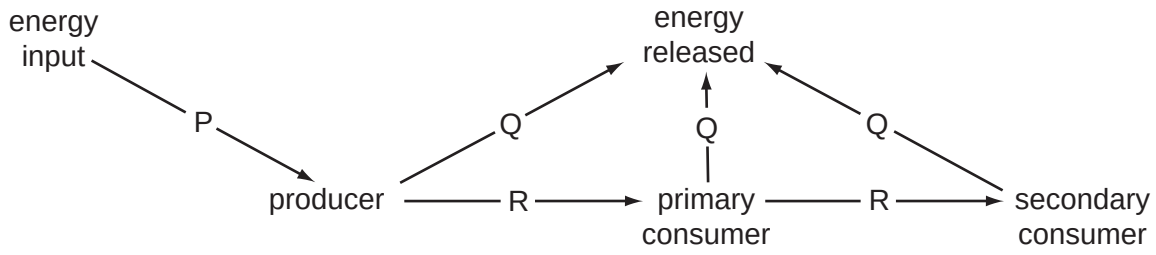
A 0 – 800

B 800 – 1200

C 1200 – 1800

D 1800 – 2000

40 The diagram shows the flow of energy in a food chain.



What are the forms of energy P, Q and R?

	P	Q	R
A	chemical	light	heat
B	heat	chemical	light
C	light	heat	chemical
D	light	chemical	heat

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