UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

BIOLOGY **5090/12**

Paper 1 Multiple Choice **May/June 2013**

1 hour

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

0871761035

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.
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.

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UNIVERSITY of CAMBRIDGE
International Examinations

1 Which structures are present in a root hair cell?

	nucleus	chloroplast
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key
✓ = present
✗ = absent

2 What is an example of active transport?

A movement of glucose molecules into the cells of the villi

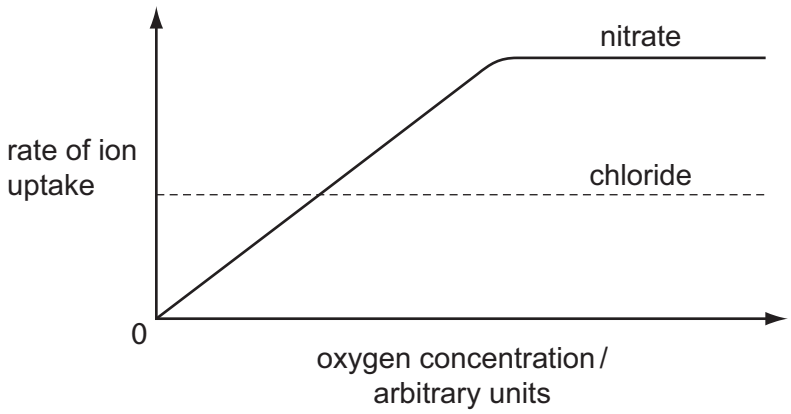
B movement of glucose molecules down a concentration gradient

C movement of ions in blood plasma

D movement of water in the transpiration stream

3 The roots of a plant are placed in a dilute solution containing chloride and nitrate ions.

The graph shows how the rate of uptake of chloride and nitrate ions by the roots of the plant varies with oxygen concentration.



What can be concluded about how chloride and nitrate ions enter the roots?

	chloride	nitrate
A	active transport	active transport
B	active transport	diffusion
C	diffusion	active transport
D	diffusion	diffusion

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4 Four test tubes, each containing 2cm^3 of amylase solution are treated as follows:

1 boiled, then cooled to 1 °C

2 boiled, then cooled to 25 °C

3 frozen, then warmed to 1 °C

4 frozen, then warmed to 25 °C

10 cm^3 of starch solution were then added to each tube and after 5 minutes, 2 drops of iodine solution were added to each tube.

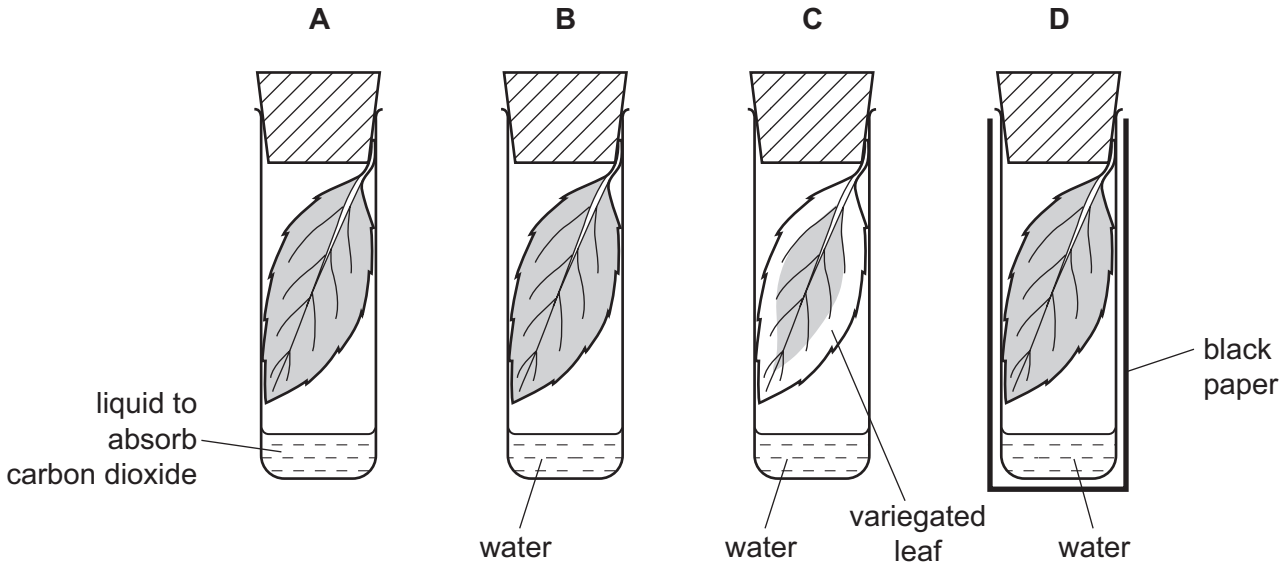
Which row shows the results?

	1	2	3	4
A	black	black	black	yellow
B	black	yellow	black	yellow
C	yellow	black	yellow	black
D	yellow	yellow	yellow	black

5 In an investigation of photosynthesis, 4 leaves are set up as shown in the diagram.

After 24 hours in the light each leaf is tested for starch.

Which tube is used to investigate whether chlorophyll is needed for photosynthesis?



6 What describes the upper cuticle of a leaf?

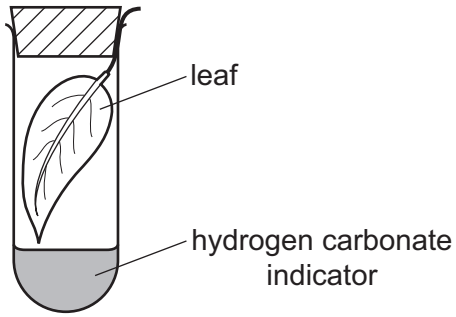
A a single layer of cells containing many chloroplasts

B a single layer of transparent cells allowing light to enter the leaf

C a thin non-cellular layer preventing water loss from the leaf

D a permeable layer allowing water to enter the leaf

7 A green leaf is picked at time 07.00 and immediately placed in a sealed test-tube containing hydrogen carbonate indicator solution. The tube is kept near a window for 24 hours. The table shows how the indicator changes in colour.



colour	amount of carbon dioxide compared to average atmospheric concentration
purple	less than normal
red	normal
yellow	more than normal

Which colour will the hydrogen carbonate indicator be at times 12.00 and 24.00?

	at 12.00	at 24.00
A	purple	yellow
B	red	purple
C	yellow	purple
D	yellow	red

8 Which classes of foods contain the elements shown?

	carbohydrates	fats	proteins
A	C,H,O	C,H,O	C,H,O and N
B	C,H,O	C,H,O and N	C,H,O
C	C,H,O	C,H,O and N	C,H,O and N
D	C,H,O and N	C,H,O	C,H,O

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9 A positive food test produces an orange precipitate.

Which test was performed?

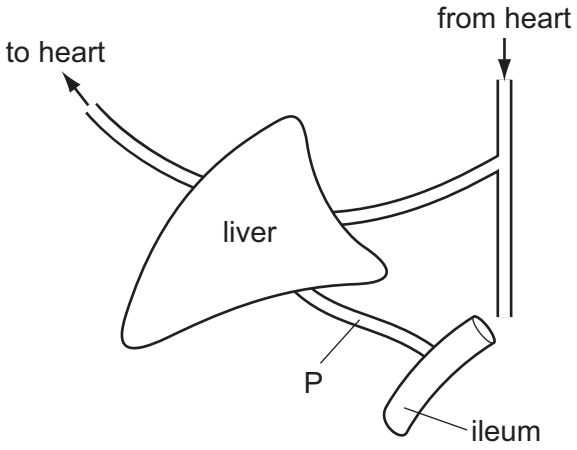
A Amino acids were mixed with cold biuret solution.

B Glucose was heated with Benedict's solution.

C Protein was heated with Benedict's solution.

D Protein was mixed with biuret solution and heated.

10 The diagram represents the liver and some associated structures.



What does the blood in blood vessel P transport?

A bile to the ileum

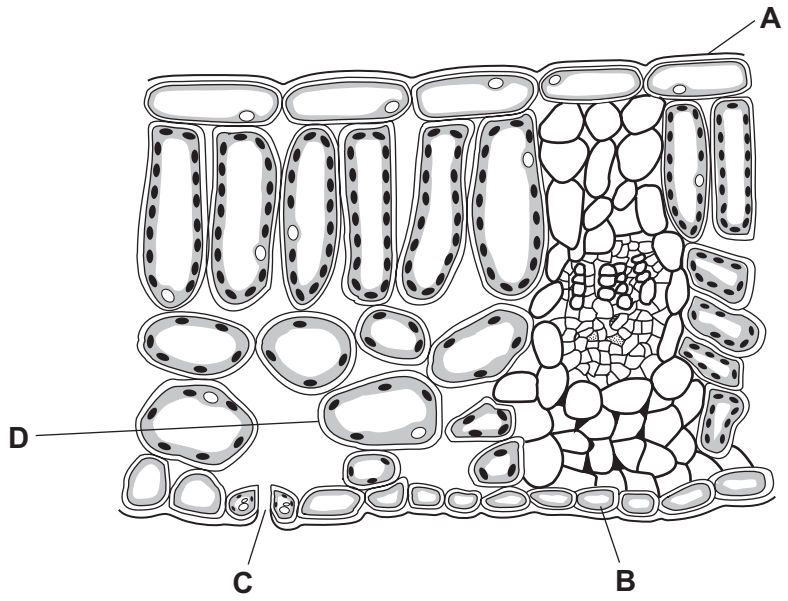
B glucose to the liver

C glycogen to the liver

D urea to the ileum

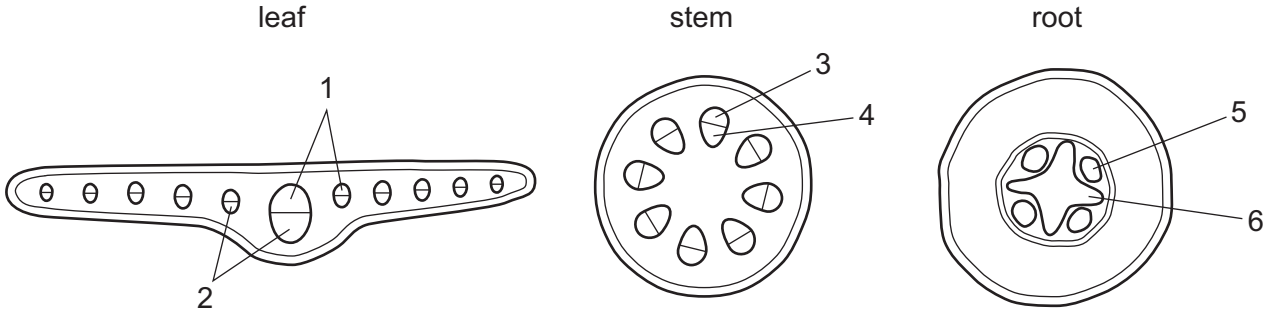
11 The diagram shows a cross-section of a leaf.

From which part does most of the water evaporate during transpiration?



12 In an experiment to investigate the transport of water, the roots of a plant are placed in water coloured with a dye.

The diagrams show sections of the leaf, stem and root.



Which numbered parts will become stained by the dye as the water is initially absorbed?

	leaf	stem	root
A	1	3	5
B	2	3	6
C	1	4	6
D	2	4	5

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13 Compared to a vein, an artery has

A a thinner wall.

B a wall with more elastic tissue**.**

C a wider lumen.

D valves.

14 Which row shows the blood vessels carrying blood to and from the organs listed?

	blood vessel carrying blood to the organ	organ	blood vessel carrying blood from the organ
A	aorta	heart	pulmonary vein
B	hepatic artery	liver	hepatic portal vein
C	pulmonary artery	lung	pulmonary vein
D	renal vein	kidney	renal artery

15 Two hours after eating a meal, which vessel contains blood with the highest concentration of glucose?

A aorta

B hepatic portal vein

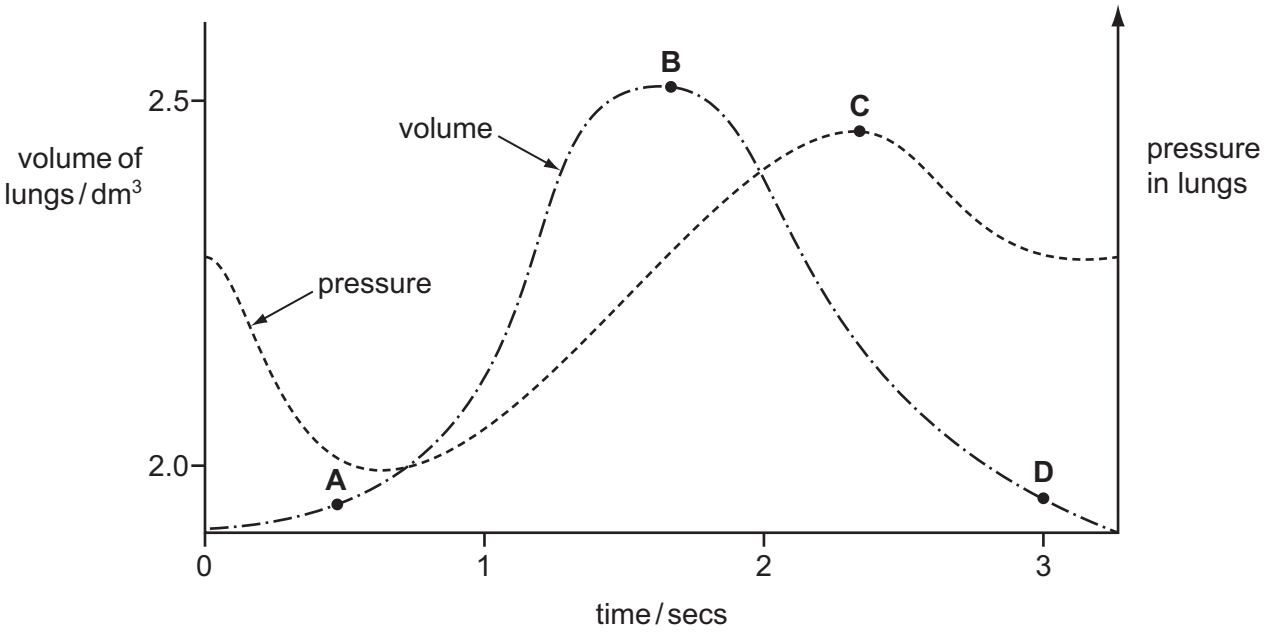
C pulmonary vein

D renal vein

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16 The graph shows how the pressure and volume inside the lungs change during one complete breath.

At which point are the muscles of the diaphragm starting to contract?



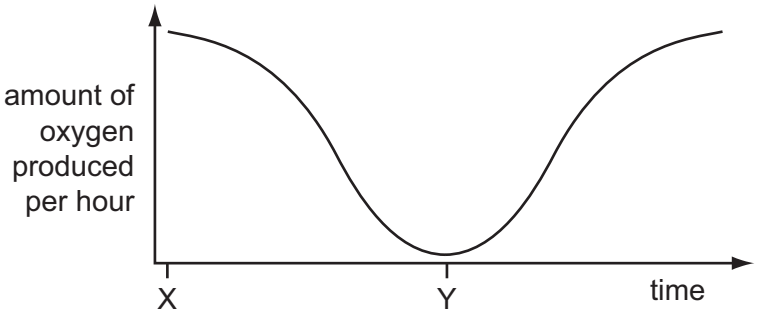
17 A new organism is discovered. It is found to be made of cells and contains DNA.

To which group of organisms could it belong to and to which group could it **not** belong?

	could be	could **not** be
A	bacteria	fungi
B	bacteria	viruses
C	fungi	bacteria
D	viruses	bacteria

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18 The graph shows the amount of oxygen produced by a green plant, growing outdoors, during a 24-hour period.



Which processes are occurring at time X and Y?

	time X		time Y	
	photosynthesis	respiration	photosynthesis	respiration
A	✓	✓	✗	✓
B	✓	✗	✓	✗
C	✗	✓	✗	✓
D	✗	✓	✓	✗

key
✓ = occurring
✗ = not occurring

19 What gives the comparison between anaerobic respiration in humans and in yeast?

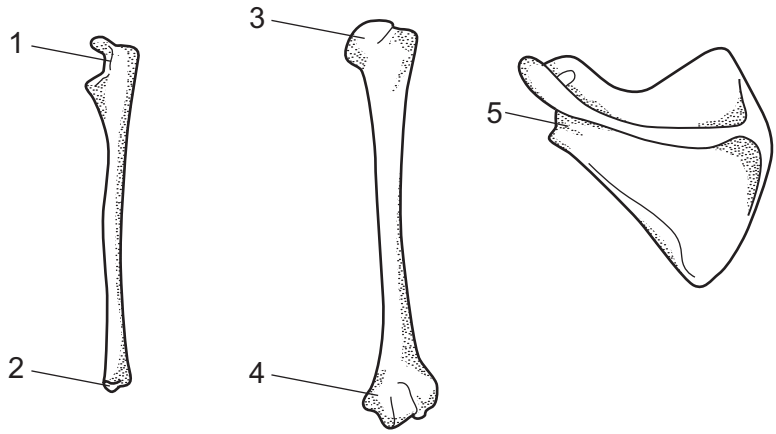
	chemical	anaerobic respiration in humans	anaerobic respiration in yeast
A	alcohol	more is produced	less is produced
B	carbon dioxide	not produced	produced
C	glucose	used	not used
D	oxygen	not used	used

20 If the air temperature is higher than the core body temperature, which processes can increase heat loss from the body?

	shivering by muscles	evaporation of sweat	vasodilation in the skin
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key
✓ = can increase heat loss
✗ = cannot increase heat loss

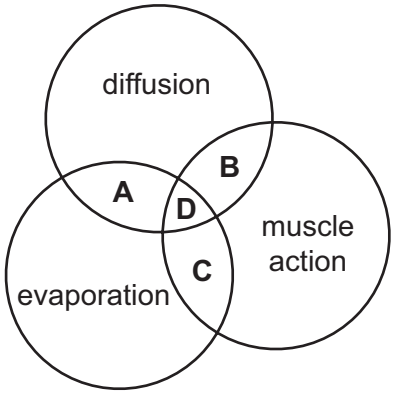
21 The diagrams represent three bones from the forelimb of a human skeleton not drawn to scale.



Between which parts will a ball and socket joint be formed?

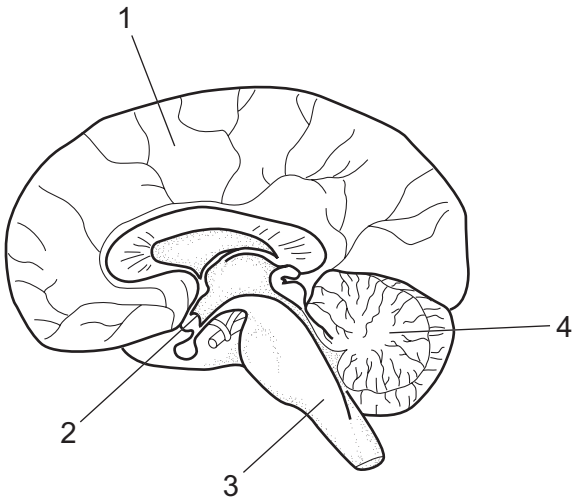
A 1 and 3 **B** 1 and 4 **C** 2 and 5 **D** 3 and 5

22 Which processes help the excretion of carbon dioxide from the lungs?



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23 The diagram represents a section through the human brain.



What are the numbered parts?

	cerebrum	cerebellum	medulla	hypothalamus
A	1	2	4	3
B	1	4	3	2
C	4	1	3	2
D	4	1	2	3

24 Insulin is a hormone, synthesised in the pancreas and is distributed around the body by the blood.

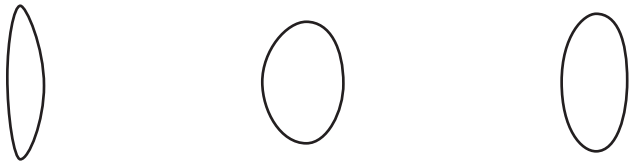
What describes its rate of secretion and its concentration in the blood?

	rate of secretion	concentration in the blood
A	constant	constant
B	constant	varied
C	varied	constant
D	varied	varied

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[Turn over

25 The diagram shows the appearance of the side view of the lens when it focuses on objects at different distances from the eye.



P Q R

Which shows the appearance of the lens when a person focuses first on a near object and then on a distant object?

	near object	distant object
A	P	Q
B	P	R
C	Q	P
D	R	Q

26 During the production of yoghurt and cheese, the pH of the mixture changes.

What causes this change in pH?

A anaerobic respiration of lactose

B coagulation of milk proteins

C production of ethanol

D release of bubbles of carbon dioxide

27 Which component of cigarette smoke is the main cause of lung cancer?

A carbon dioxide

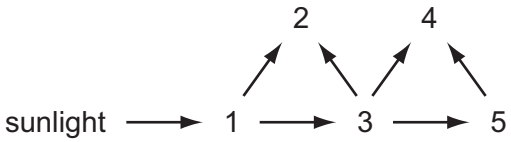
B carbon monoxide

C nicotine

D tar

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28 The diagram shows energy flow in a food web.



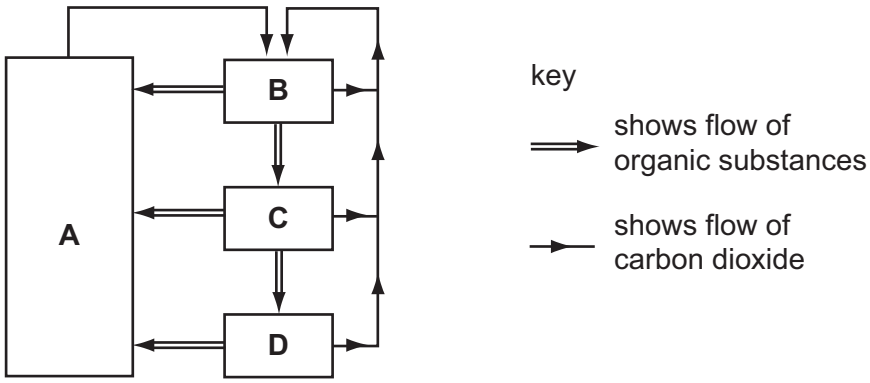
Which number represents an organism that eats both plants and animals?

A 2 **B** 3 **C** 4 **D** 5

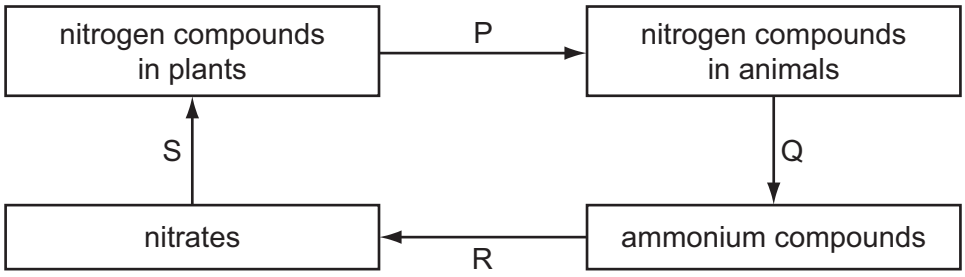
29 The diagram represents the flow of substances within a balanced ecosystem.

The boxes are various trophic levels.

Which box represents producers?



30 The diagram shows part of the nitrogen cycle.



Which stages depend on bacteria?

A P, Q, R and S

B P and S only

C Q and R only

D R and S only

31 Which factor does **not** help to make the mosquito an effective vector of malaria?

A Mosquitoes are attracted to warmth and carbon dioxide.

B Mosquitoes lay their eggs in water.

C Mosquito saliva stops blood from clotting.

D The malaria pathogens live in mosquito salivary glands.

32 What is **not** a consequence of global warming?

A reduction in sea level

B reduction in thickness of polar ice

C species migration to cooler habitats

D spread of deserts

33 What describes cross-pollination?

A when one flower pollinates a different flower on a different plant of the same species

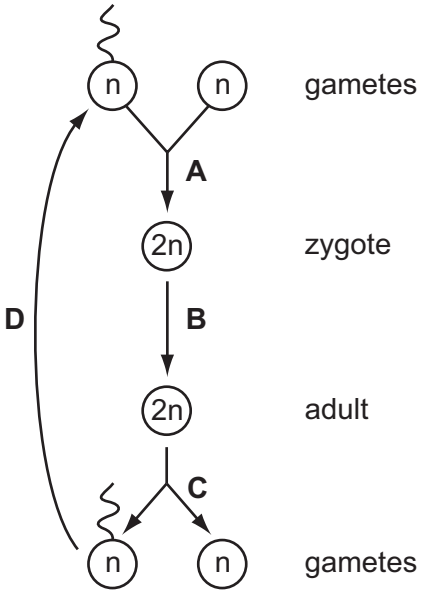
B when one flower pollinates a different flower on the same plant

C when one flower pollinates a flower of a different species

D when one flower pollinates the same flower

34 The diagram shows cells at different stages in the life cycle of an organism.

At which stage does meiosis occur?



35 Where does the placenta allow the exchange of materials to take place between mother and fetus?

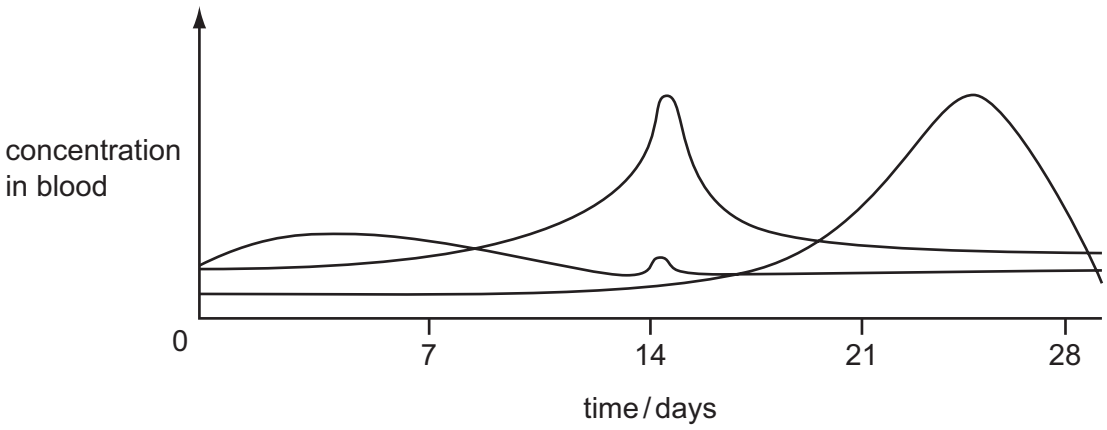
A oviduct wall

B umbilical cord

C uterus wall

D vagina wall

36 The graph shows the concentration in the blood of three of the four hormones FSH, LH, oestrogen and progesterone.



Which hormone is **not** shown?

A FSH

B LH

C oestrogen

D progesterone

37 The genotype for the height of an organism is written as Tt.

What conclusion may be drawn?

A The allele for height has at least two different genes.

B There are at least two different alleles of the gene for height.

C There are two different genes for height, each having a single allele.

D There is one allele for height with two different forms.

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38 A scientist takes 4 pairs of samples from a wild cherry tree.

In which pair of samples could there be cells with different genotypes?

A two fruits

B two leaves

C two petals

D two root cuttings

39 How many chromosomes are there in a zygote which develops into a baby with Down's syndrome?

A 23 **B** 24 **C** 46 **D** 47

40 Which statement describes an example of artificial selection?

A It has been found that some strains of bacteria produce antibiotics.

B It is common practice to mate bulls with cows that produce the most milk.

C It is possible to control caterpillars on food crops by releasing small wasps which lay their eggs in caterpillars and kill them.

D Mosquitoes have developed strains that are resistant to insecticides.

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