

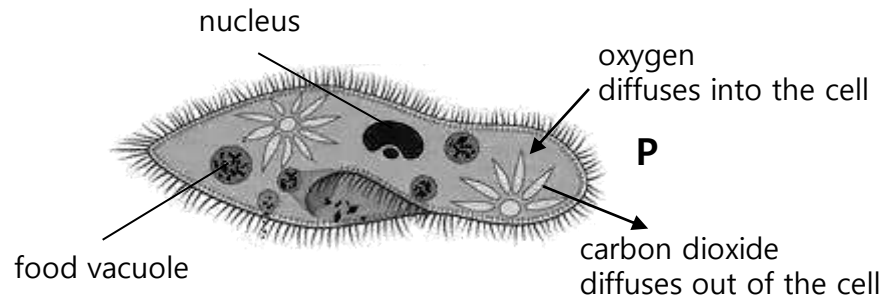
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MEMO

001.

The diagram shows a paramecium, a single-celled living organism.



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

- A** excretion and respiration
- B** respiration only
- C** nutrition and respiration
- D** nutrition and reproduction

002.

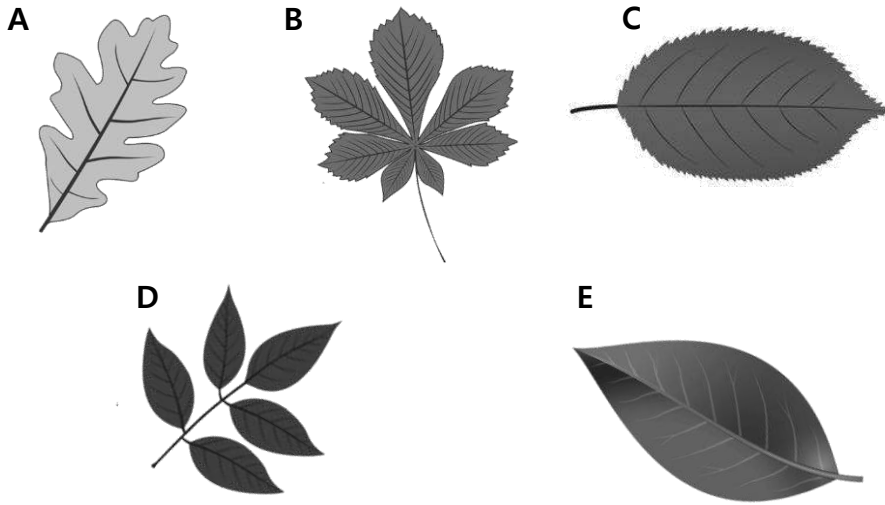
Which process in plant cells uses chloroplast and mitochondria?

	chloroplast	mitochondria
A	growth	breathing
B	respiration	breathing
C	nutrition	respiration
D	nutrition	breathing

074.

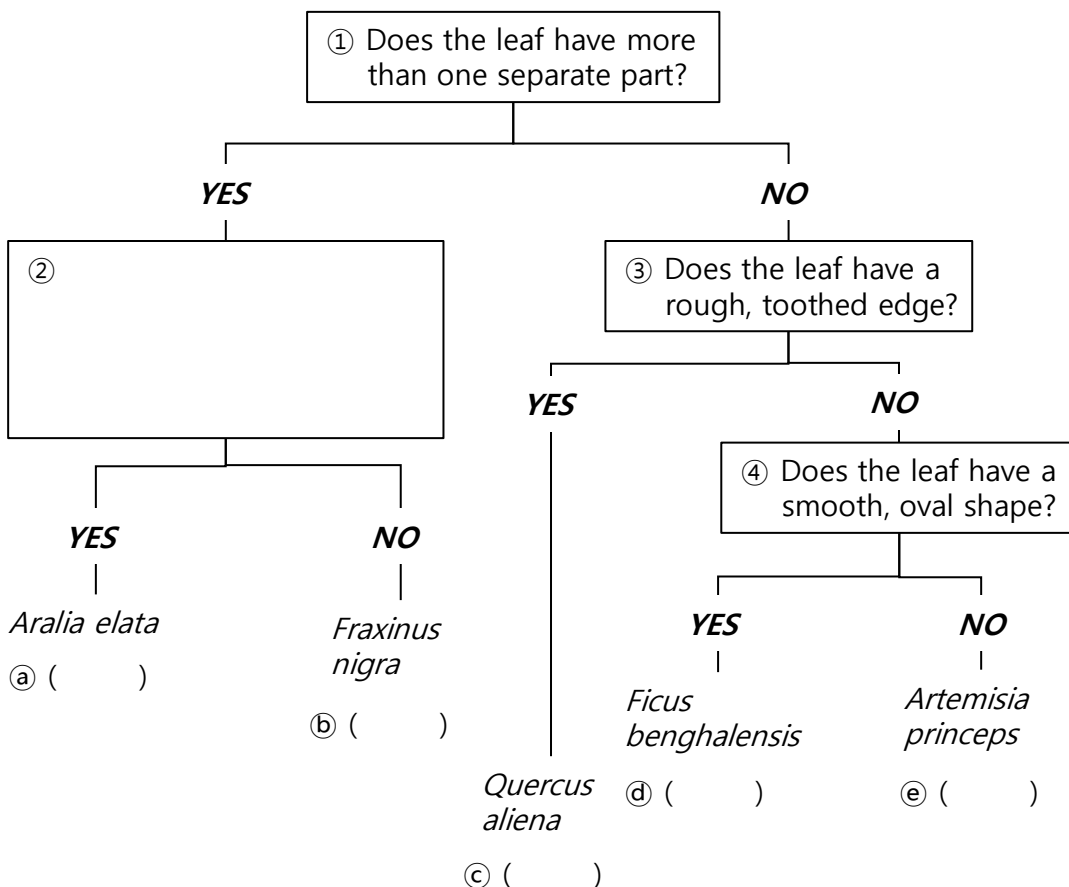
MEMO

The figure below shows six leaves.



The diagram below is a key which can be used to identify the five leaves shown in figure above. The key shows the scientific names of the five trees that the leaves came from. In this key Box ② is missing.

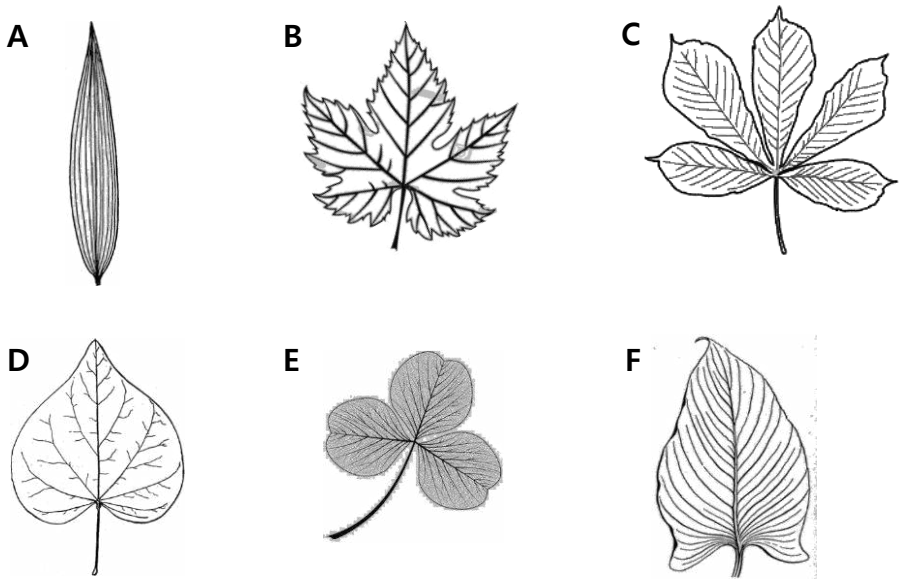
Write your answer in Box ② and complete blank, ①~⑤, by writing the correct letter each type of leaf.



MEMO

077.

The figure below shows six leaves.



Use the key to identify the plants that these leaves came from. Write the letter for each leaf in the key.

description		name of organism	letter
1 (a)	parallel vein	go to 2	
(b)	netted vein	go to 3	
2 (a)	narrower leaf width	<i>Zea mays</i>	
(b)	wider leaf width	<i>Musa basjoo</i>	
3 (a)	leaf has thorns (spikes)	<i>Vitis vinifera</i>	
(b)	leaf has no thorns (spikes)	go to 4	
4 (a)	leaf divided into sections	go to 5	
(b)	leaf not divided into sections	<i>Petasites japonicus</i>	
5 (a)	leaf divided into 3 sections	<i>Trifolium repens</i>	
(b)	leaf divided into more than 3 sections	<i>Artemisia princeps</i>	

MEMO

079.

Mammals are one of the five groups of vertebrates.

The list describes some of the features of fish, amphibians, reptiles, birds and mammals. Some features belong to more than one group.

State the name of one vertebrate group which has the distinguishing feature of:

gills

.....

smooth moist skin

.....

feathers

.....

lactation

.....

080.

There are two groups of vertebrates which lay eggs that develop in water. State the name of these two groups of vertebrates.

1

2

000.

Leopards are mammals and have the scientific name *Panthera pardus*.

① State the genus of this mammal.

.....



② State one feature visible in figure that identifies the leopard as a mammal.

.....



03. Features and Classifying of Organisms

		047.	D	048.	B	049.	B	050.	D
051.	B	052.	C	053.	C	054.	B	055.	B
056.	C	057.	C	058.	C	059.	C	060.	C
061.	B	062.	D	063.	A	064.	A	065.	D
066.	C	067.	C	068.	C	069.	C	070.	C
071.	B	072.	B						

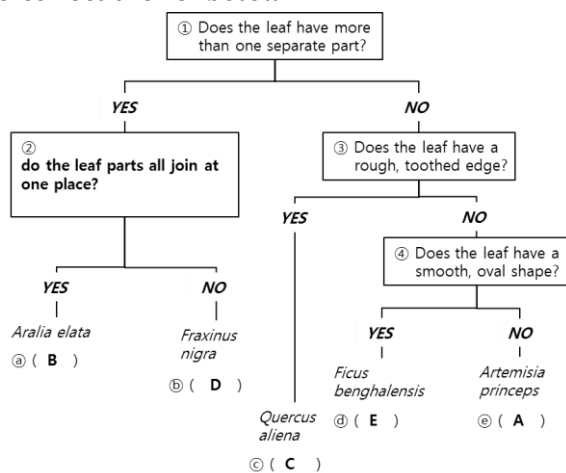
073. Answer

Choosing one term for each question;

- X** 1. jagged edge of carapace
2. claws same length
- Y** 1. hair on claws
2. eyes on stalks
- W** 1. uneven length of claws
2. rectangular, carapace
- Z** 1. short antennae
2. claws same length

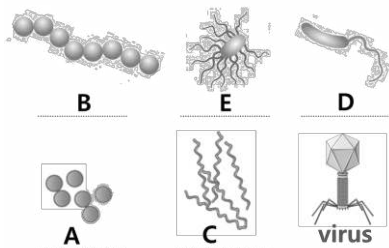
074. Answer

The correct answer **below**.



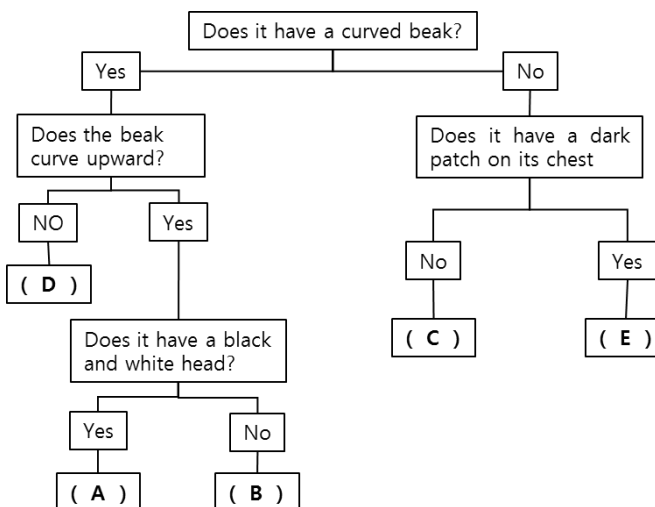
075. Answer

The correct answer **below**;



076. Answer

The correct answer **below**.



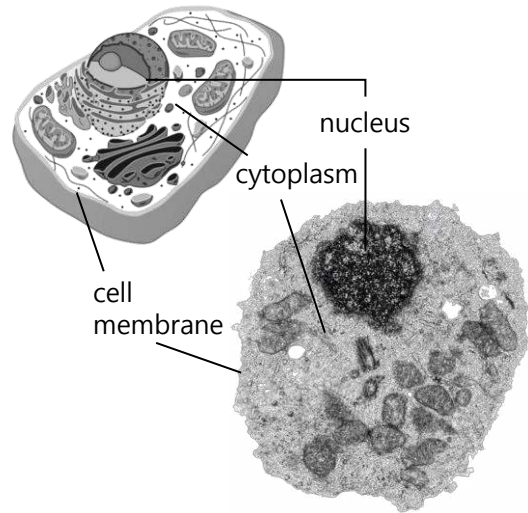
077. Answer

The correct answer **below**.

	description	name of organism	letter
1 (a)	parallel vein	go to 2	
(b)	netted vein	go to 3	
2 (a)	narrower leaf width	<i>Zea mays</i>	A
(b)	wider leaf width	<i>Musa basjoo</i>	F
3 (a)	leaf has thorns (spikes)	<i>Vitis vinifera</i>	B
(b)	leaf has no thorns (spikes)	go to 4	
4 (a)	leaf divided into sections	go to 5	
(b)	leaf not divided into sections	<i>Petasites japonicus</i>	D
5 (a)	leaf divided into 3 sections	<i>Trifolium repens</i>	E
(b)	leaf divided into more than 3 sections	<i>Artemisia princeps</i>	C

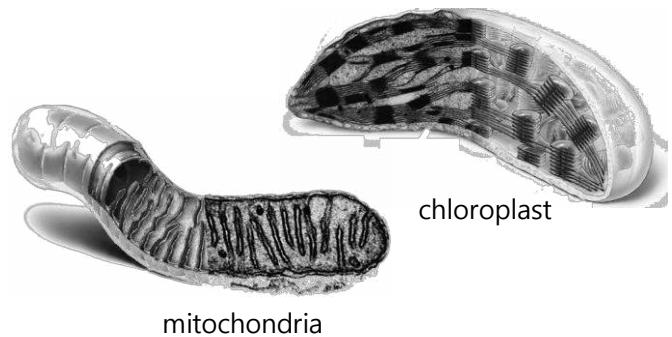
③ Nucleus, Cytoplasm, Cell membrane

- (a) cytoplasm
 - i . inside cell → contains all other cell structures
 - ii. supports cell structure
 - iii. contains water and many solutes
- (b) nucleus
 - i . surrounded by a nuclear membrane
 - ii. contains genetic material in chromosome
 - iii. controls cell division
- (c) cell membrane
 - i . surrounds cell
 - ii. controls substance entering and leaving cell



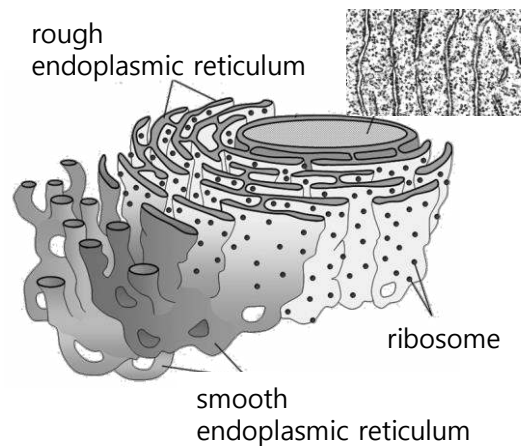
④ Mitochondria, Chloroplast, Vacuole

- (a) mitochondria
 - i . site of aerobic respiration.
 - ii. providing energy for cell
 - iii. cells with high rates of metabolism
→ have higher numbers of mitochondria
- (b) chloroplast
 - i . site of photosynthesis
 - ii. providing food for plant and animal.
 - iii. chlorophyll pigments absorb light energy
→ needed for reaction to occur
- (c) vacuole
 - i . used for storage of certain materials
 - ii. support shape of cell



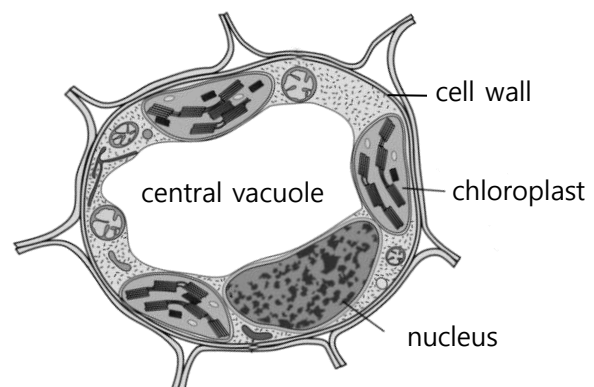
⑤ Ribosome, Endoplasmic Reticulum, Vesicle

- (a) ribosome
 - site of protein synthesis
- (b) endoplasmic reticulum
 - membrane system
 - forms a series of flattened sacs within cytoplasm
- (c) vesicle
 - small circular sac for substance transporting



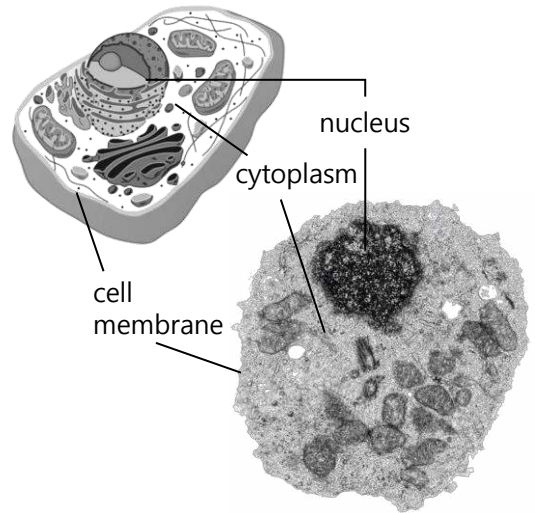
⑥ Cell Wall

- structural layer surrounding some types of cells
→ outside cell membrane
- provides cell
→ structural support and protection
→ also acts as a filtering mechanism



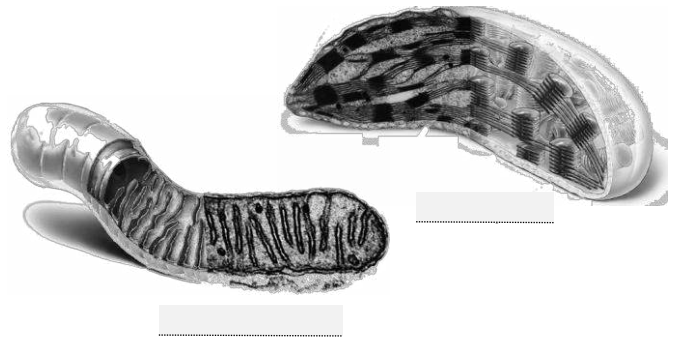
③ Nucleus, Cytoplasm, Cell membrane

- (a) _____
 i. inside cell → contains all other cell structures
 ii. supports cell structure
 iii. contains _____
- (b) nucleus
 i. surrounded by a nuclear membrane
 ii. contains _____
 iii. controls cell division
- (c) _____
 i. surrounds cell
 ii. _____



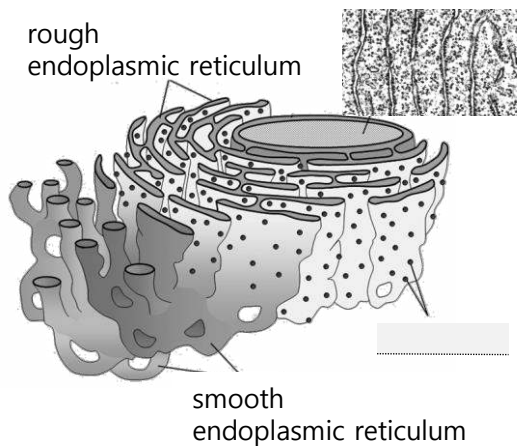
④ Mitochondria, Chloroplast, Vacuole

- (a) _____
 i. site of _____
 ii. providing energy for cell
 iii. cells with high _____
 → have higher numbers of mitochondria
- (b) _____
 i. site of _____
 ii. providing food for plant and animal.
 iii. _____
 → needed for reaction to occur
- (c) _____
 i. used for storage of certain materials
 ii. support _____



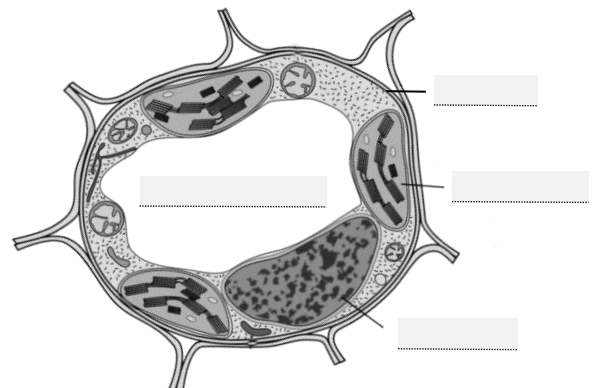
⑤ Ribosome, Endoplasmic Reticulum, Vesicle

- (a) ribosome
 site of _____
- (b) endoplasmic reticulum
 membrane system
 → forms a series of _____ within cytoplasm
- (c) _____
 small circular sac for _____



⑥ Cell Wall

- structural layer surrounding some types of cells
 → outside cell membrane
- provides cell
 → _____
 → also acts as a filtering mechanism



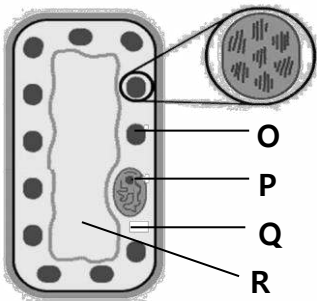
MEMO

101.

The diagram shows a palisade mesophyll cell from a green leaf.

In which labelled part does photosynthesis occur and where is organic materials stored?

	photosynthesis occurs	organic materials are stored
A	P	Q
B	O	R
C	R	P
D	Q	O



102.

Four cell structures are listed.

1. cell membrane
3. chloroplast
2. mitochondria
4. cytoplasm

Which structures are found in palisade cells and in liver cells?

- A 3 only
- B 1 and 2
- C 3 and 4
- D 1, 2, and 4

103.

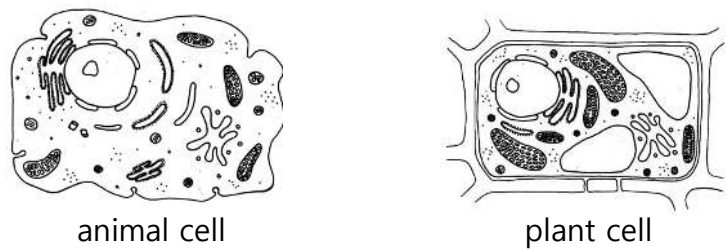
In a plant cell, where are chloroplasts found?

- A in the vacuole
- B in the nucleus
- C in the cytoplasm
- D between the cell membrane and the cell wall

135.

MEMO

The figure below shows an animal cell and a plant cell as seen with a microscope.



The table below shows some structural features of the animal cell and the plant cell in the figure above.

- Complete the table by
- finishing the row for cell wall
 - adding three structural features, visible in the figure, and indicating whether they are present (O) or absent (X) in the animal cell and in the plant cell.

structural feature	animal cell	plant cell
cell membrane	O	O
cell wall		

136.

Name two structures, visible with a light microscope, which distinguish plant cells from animal cells.

1

2

MEMO

325.

Different factors affect the rate of diffusion of particles across a membrane.

Which row represents changes to factors that will increase the rate of diffusion?

	temperature	surface area of membrane	concentration gradient across a membrane	thickness of membrane
A	decrease	increase	increase	decrease
B	increase	decrease	decrease	increase
C	decrease	increase	decrease	increase
D	increase	increase	increase	decrease

326.

State the name of the outer part of an animal cell that substances move through during diffusion.

.....

MEMO

342.

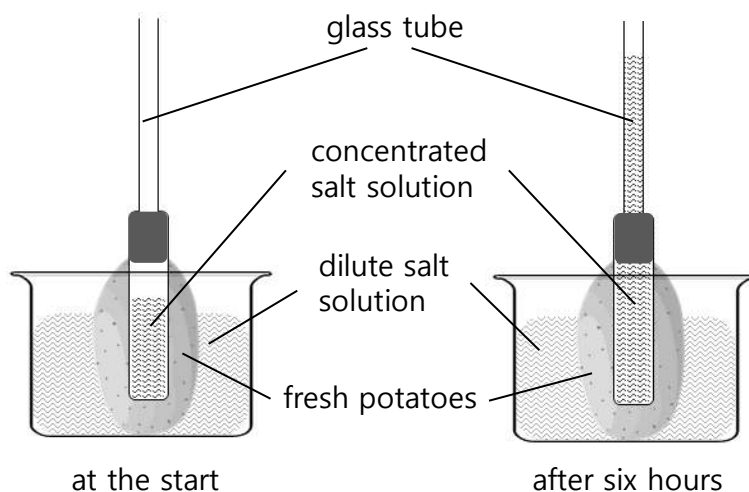
Two identical cuboids, 50mm long, are cut from a potato. One (X) is placed in water and the other (Y) is placed in a concentrated salt solution.

What are the lengths of the cuboids after three hours?

	length of cuboids (mm)	
	cuboid X	cuboid Y
A	50	47
B	53	47
C	50	50
D	53	50

343.

The diagram shows the movement of a concentrated salt solution up a glass tube. The glass tube is connected firmly to a hollowed-out potatoes.



Why does the sugar solution in the glass tube rise?

- A Water molecules move across the potato tissue into the glass tube.
- B Salt molecules move across the potato tissue into the glass tube.
- C Water molecules move across the potato tissue into the beaker.
- D Salt molecules move across the potato tissue into the beaker.

MEMO

354.

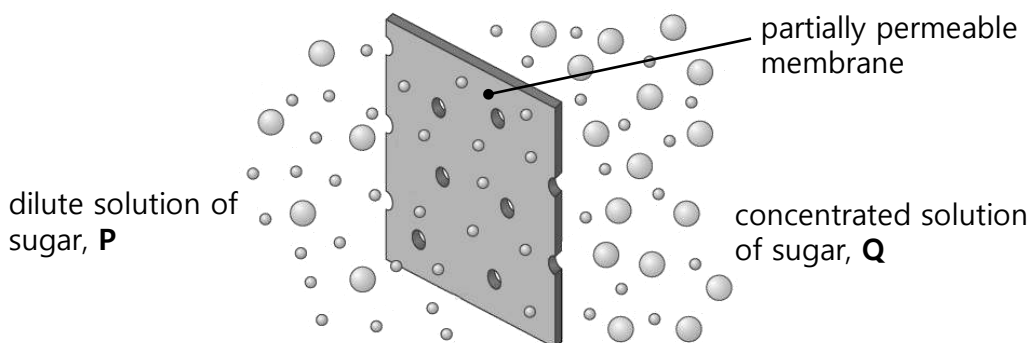
A red blood cell is placed in pure water.

What happens and why?

- A** The cell bursts because water enters its inside.
- B** The cell bursts because the organelles leave out.
- C** The cell shrinks because water enters its inside.
- D** The cell shrinks because the organelles leave out.

355.

The diagram at the below shows two solutions that are separated by a partially permeable membrane.



In which direction will most water molecules move in relation to their concentration gradient?

- A** from **Q** to **P** down their concentration gradient
- B** from **P** to **Q** down their concentration gradient
- C** from **P** to **Q** against their concentration gradient
- D** from **Q** to **P** against their concentration gradient

MEMO

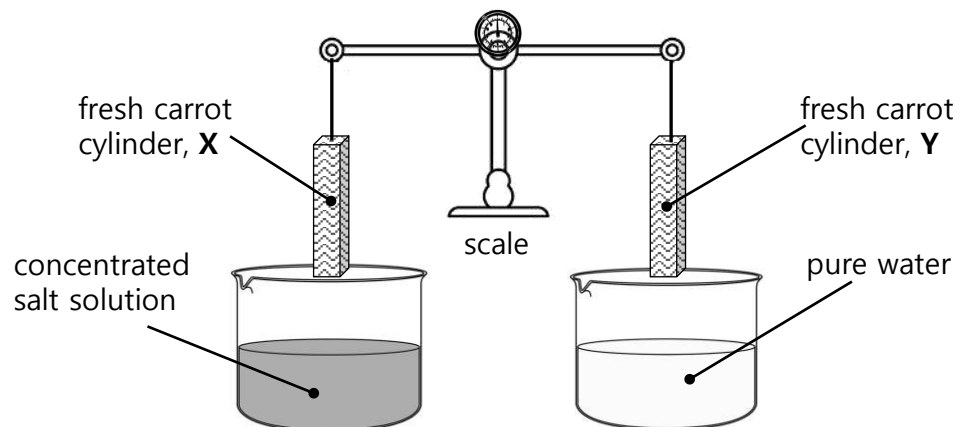
356.

What is an example of osmosis?

- A** Oxygen goes out through the stomata of a leaf.
- B** Water is absorbed by the roots of plants in the soil.
- C** Carbon dioxide goes into an alveolus from the blood.
- D** The scent of perfume spreads throughout a room.

357.

A student experimented osmosis in carrots. She set up the apparatus shown.



At the beginning the carrot cylinders were exactly balanced. she immersed the cylinders into the liquids for three hours, after which the cylinders were lifted out of the liquids. Cylinder **Y** was now heavier than cylinder **X**.

Which statement explains what happened?

- A** Water moved out of both cylinders.
- B** Water moved into both cylinders.
- C** Water moved out of the cylinder in the salt solution and into the cylinder in the pure water.
- D** Water moved out of the cylinder in the pure water and into the cylinder in the salt solution.

MEMO

380.

A student investigated the effect of immersing small pieces of potato in different concentrations of sucrose solution. The pieces were surface dried with paper towels and weighed. The small pieces of potato were then immersed in sucrose solutions for two hours. After two hours the student surface dried the pieces and weighed them again. Their results are given in the table below.

concentration of sugar solution (gdm ³)	mass of potato pieces (g)		percentage change in mass (%)
	before immersing	after immersing	
0	15.2	17.4	+14.5
30	14.8	14.5	-2.0
60	15.3	14.6	-4.6
90	16.0	14.9	-6.9
120	14.9	13.7	

- ① Calculate the percentage change in mass of the pieces that were in the most concentrated solution of sucrose.
Write your answer in the table above.

.....

.....

- ② Explain why the students calculated the percentage change in mass of the pieces.

.....

.....

.....

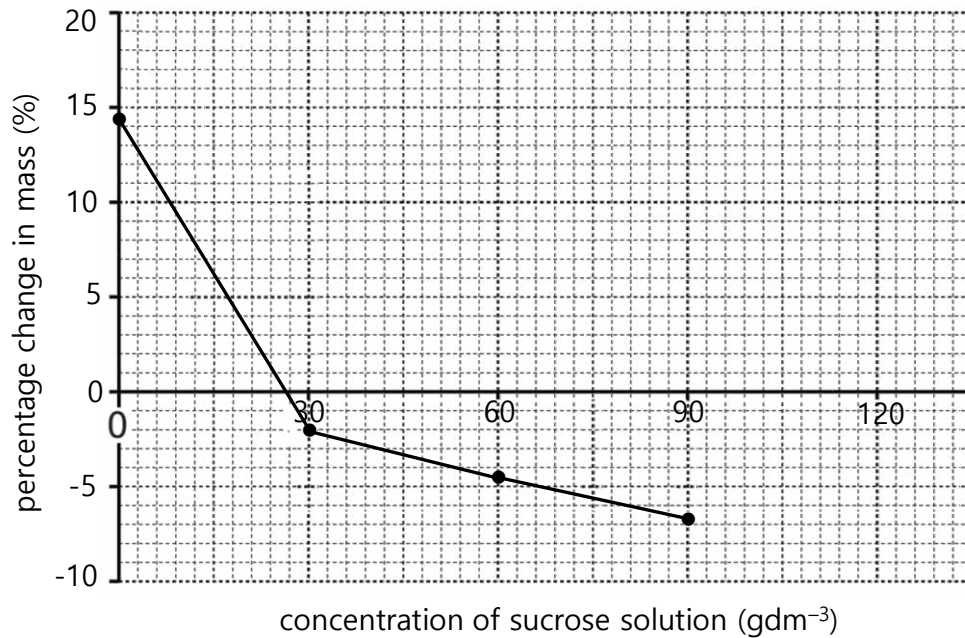
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continue to the next page ...

MEMO

From the previous page...

The student plotted a graph of the results as shown in the graph below.



- ③ Complete the graph;
- ④ Use the graph above to estimate the concentration of the sucrose solution that has the same water potential as the potatoes.

.....

- ⑤ Using the term water potential, explain why the potatoes:
- a) lost mass when immersed in concentrated solutions of sucrose

.....

.....

.....

- b) gained mass when immersed in dilute solutions of sucrose

.....

.....

.....

MEMO

401.

Which row shows the composed elements and basic units that are used in the construction of large food molecules?

	food molecules	basic units	composed elements
A	oil	glycerol and fatty acid	C, H, O
B	protein	amino acid	C, H, O
C	starch	simple sugar	C, H, O, N
D	fat	glucose	C, H, O, S

402.

Which nutrients are the polymer of amino acids?

- A** glycogen
- B** protein
- C** lipid
- D** DNA

403.

Which elements do fats contain?

- A** carbon, hydrogen, sulfur
- B** carbon, hydrogen, oxygen
- C** carbon, hydrogen, oxygen, nitrogen
- D** carbon, hydrogen, oxygen, sulfur

MEMO

417.

The diagram shows the structure of part of a DNA molecule.

What does **P** represent?

- A base
- B phosphate
- C sugar
- D nucleotide



418.

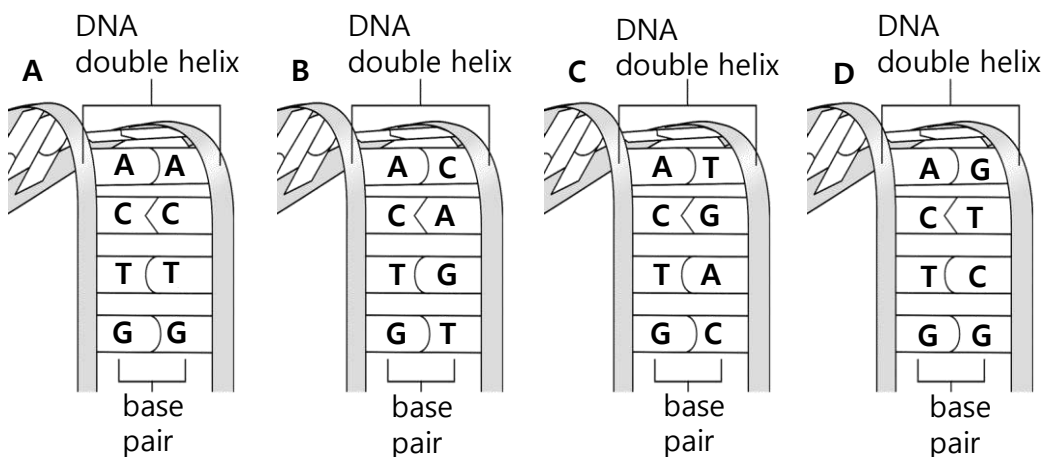
Small molecules are used as the basic units in the synthesis of large food molecules.

Which statement is **not** correct?

- A Fatty acid is a basic unit of lipid.
- B Glycerol is a basic unit of glycogen.
- C Nucleotides are basic unit of DNA.
- D Glucoses are basic unit of cellulose.

419.

Which diagram shows the structure of DNA?



MEMO

420.

The bases on one of the strands of a DNA double helix have the sequence shown at the below.

C-T-A-A-G-C

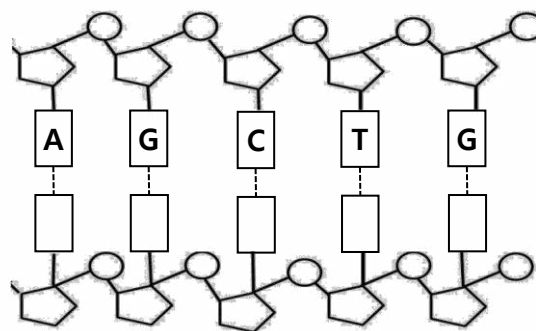
What is the corresponding sequence of bases on the other strand?

- A** C-T-A-A-G-C
- B** A-G-C-C-T-A
- C** T-C-G-G-A-T
- D** G-A-T-T-C-G

421.

The diagram shows a section of DNA, with four bases identified on one strand.

Which sequence of bases would be on the other strand, starting from the left?



- A** TGCAG
- B** TCGAC
- C** AGCTA
- D** ACGTA

422.

DNA is important nitrogen-containing compounds in cells.

Describe the roles of DNA in cells.

.....

.....

.....

01. Carbohydrates, Fats and Proteins

						394.	C	395.	B
396.	C	397.	A	398.	C	399.	B	400.	D
401.	A	402.	B	403.	B	404.	B		

405. **Answer**The correct answer on **below**.

Select the two terms below.

protein/ hormone/ enzyme/ amylase/ insulin

406. **Answer**The correct answer on **below**.

carbon/ hydrogen/ oxygen/ nitrogen. sulfur

407. **Answer**The correct answer on **below**.

- catalyse (control) reactions or enzymes
e.g. respiration, photosynthesis
- carrier proteins
part of cell membranes
allowing movement in and out of cell ;
- haemoglobin
transport of oxygen, carbon dioxide
- making cytoplasm

408. **Answer**The correct answer on **below**.

- carbon (C)
- hydrogen (H)
- oxygen (O)
- nitrogen (N)
- sulfur (S)

02. Water and Vitamins

						409.	C	410.	A
--	--	--	--	--	--	------	---	------	---



03. Food Test

411.	C	412.	A	413.	A				
------	---	------	---	------	---	--	--	--	--

04. Structure of DNA

						414.	C	415.	B
416.	B	417.	A	418.	B	419.	C	420.	D
421.	B								

422. **Answer**The correct answer on **below**.

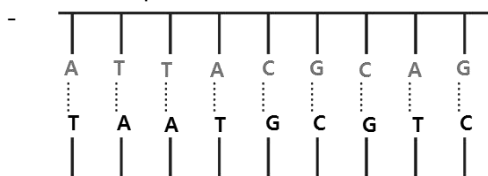
- genetic information or genetic code for proteins
control functions of the cell

423. **Answer**The correct answer on **below**.

- carbon (C)
- hydrogen (H)
- oxygen (O)
- nitrogen (N)
- phosphorus (P)

424. **Answer**

The correct answer should include the following words and phrases:



MEMO

447.

Explain why enzymes are necessary for biological processes.

.....

.....

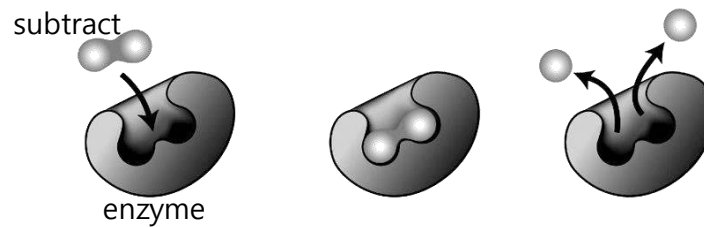
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.....

.....

448.

The action of enzymes is often explained in terms of the 'lock and key' model as shown in figure below.



Use the figure above to explain how enzymes work to break down substrate.

.....

.....

.....

.....

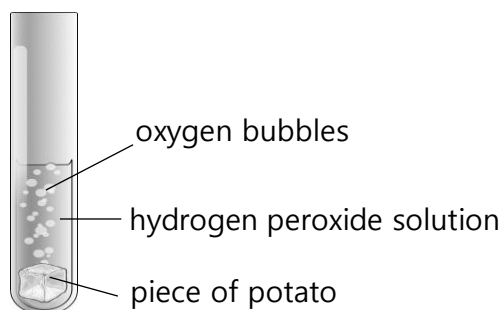
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MEMO

458.

The enzyme catalase, found in potato, speeds up the breakdown of hydrogen peroxide. The reaction releases oxygen bubbles.

The diagram shows an experiment to find the effect of changes in temperature on the rate of this reaction. And the table shows the time taken for the bubbles to reach the top of the test-tube at different temperature.



temperature (°C)	time (min)
10	10.5
20	6.0
30	3.5
40	4.0
50	5.5

Which temperature is nearest to the optimum for this enzyme?

- A** 10°C **B** 20°C **C** 30°C **D** 40°C

459.

The temperature of an enzyme reaction is increased by 15°C.

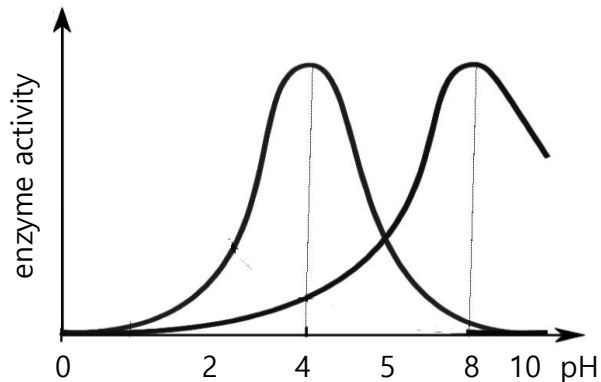
How does this affect the rate of reaction?

- A** It always increases the rate of enzyme reaction.
B It always decreases the rate of enzyme reaction.
C It may increase or decrease the rate of enzyme reaction.
D It has no effect on the rate of enzyme reaction.

MEMO

462.

The graph shows the effect of pH on the activity of two enzymes.

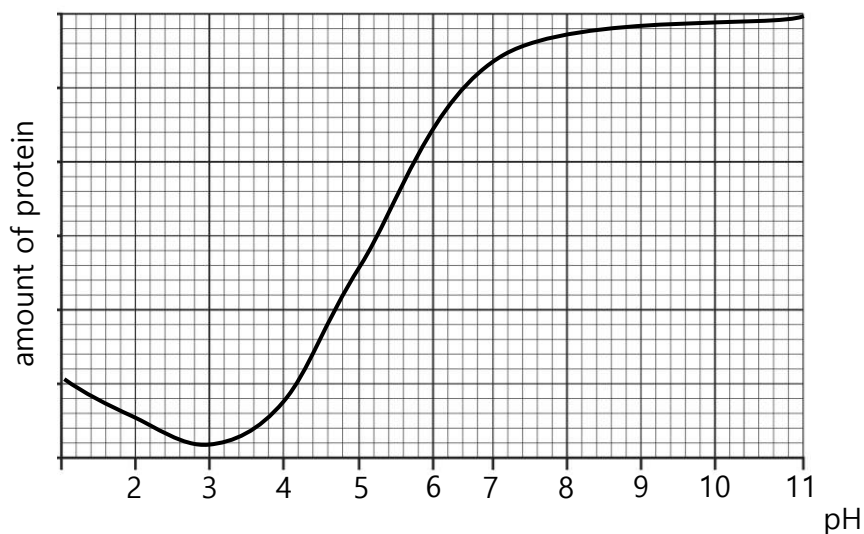


At which pH is the activity of two enzymes the same?

- A** 2 **B** 4 **C** 5 **D** 8

463.

Equal quantities of a protein-digesting enzyme were added to 10cm³ of protein solutions of different pH. Each tube was kept at 36°C. The amount of remained protein in each tube was measured after 20 minutes. The results are shown in the graph.



- A** 2 **B** 3 **C** 8 **D** 11

02. Enzyme Investigation

451.	A	452.	B	453.	B	454.	A	455.	C
456.	B	457.	C	458.	C	459.	C	460.	A
461.	D	462.	C	463.	B	464.	D	465.	D
466.	B	467.	C	468.	A	469.	D	470.	A
471.	B	472.	B	473.	B	474.	B	475.	B
476.	C	477.	D						

478. Answer

The correct answer should include the following words and phrases:

- Ⓐ **below** optimum temperature;
increases the activity of enzymes as the more energy the substrate molecules
- Ⓑ **at optimum temperature** (35°C);
enzyme has the **highest activity**
- Ⓒ **above** optimum temperature;
enzyme are **denatured** and
enzyme activity decline

479. Answer

The correct answer on **below**.

- ① 35°C
- ② catalase are denatured, and the enzymes can no longer combine with the substrates.
- ③ pH

480. Answer

The correct answer on **below**.

A and B

Effect of denaturation: In the test tube A, lysozyme **worked normally**, so bacteria's cell wall was broken down and killed. In the test tube B, lysozyme was **denatured**, so lysozyme was **inactive** and so bacteria's cell wall **was not broken down**.

A and C

Effect of temperature: : In the test tube A, lysozyme **worked normally**, so bacteria's cell wall was broken down and killed. In the test tube C, lysozyme was **denatured**, so lysozyme was **inactive** and so bacteria's cell wall **was not broken down**.

A and D

Effect of type of bacteria: : In the test tube A, lysozyme **worked normally**, so bacteria P's cell wall was broken down and killed. In the test tube D, lysozyme **also worked normally**, but **bacteria Q was resistant to lysozyme**, so bacteria Q grew.

481. Answer

The correct answer on **below**.

①
Cellulase activity is **similar in both** areas and **protease** activity is **greater in area Y** than in area X. And **both enzymes** activity is **greater in area Y** than in area X.

②
Cellulase activity was not affected by soil **water content** and soil **pH**.
But **protease** was more active in **lower soil pH** and **lower water content**.

482. Answer

The correct answer on **below**.

①
It is **little activity until day 6** then **increase to day 14** and **peak at day 14**. And it **decrease to day 18**.

②
The two graphs show **different shapes of the lines**, so there is **enzyme activity in both pH**. Enzyme activity influenced by pH and quote of activity at **pH 6 and pH 8 on a specified day**. Optimum pH of one enzyme is 6 and another is 8.

483. Answer

The correct answer should include the following words and phrases:

- ①
 - Ⓐ temperature is a **control variable**
 - Ⓑ **optimum temperature** is 35°C
- ②
 - Ⓐ **control** experiment to compare result
 - Ⓑ to show that lipid solution does not breakdown without enzymes
- ③
 - Ⓐ species **A and C have lipase** and species **B has no lipase**
 - Ⓑ species **A** has more lipase than **C**