

Class	Register Number	Name
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南洋女子中學校
NANYANG GIRLS' HIGH SCHOOL

End-of-Year Examination 2015
Secondary Three

BIOLOGY

Paper 1

Tuesday

Additional materials: Multiple Choice Answer Sheet

Multiple Choice

6 October 2015

45 minutes

0800 - 0845

READ THESE INSTRUCTIONS FIRST

Do not open this booklet until you are told to do so.

Write your name, register number and class in the spaces at the top of this page.

There are **thirty** questions in 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 shade your choice in **pencil** on the separate Answer Sheet.

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

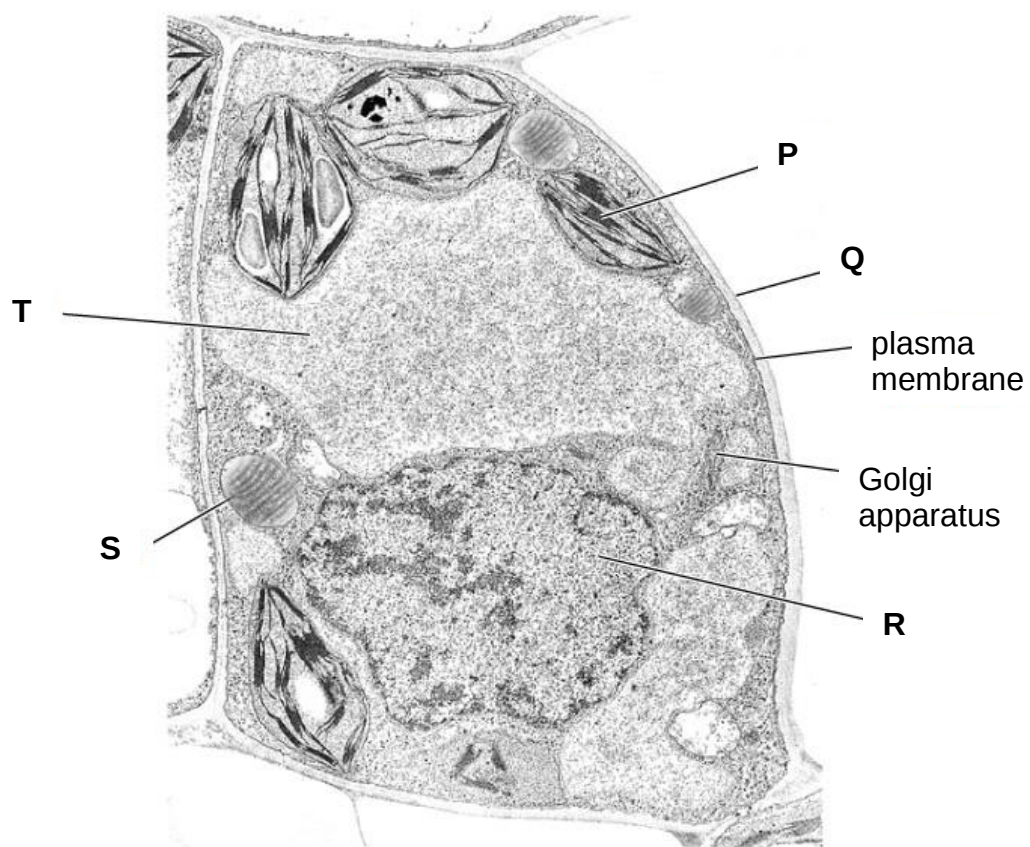
Any rough working should be done in this booklet.

The use of an approved scientific calculator is expected, where appropriate.

1 Which row correctly identifies the functions of the organelles listed?

	mitochondrion	ribosome	vacuole	rough endoplasmic reticulum
A	releases energy	modifies protein	sorts substances	makes proteins
B	releases energy	synthesises protein	stores substances	transports proteins
C	transports protein	modifies protein	stores substances	makes proteins
D	transports protein	synthesises protein	sorts substances	transports proteins

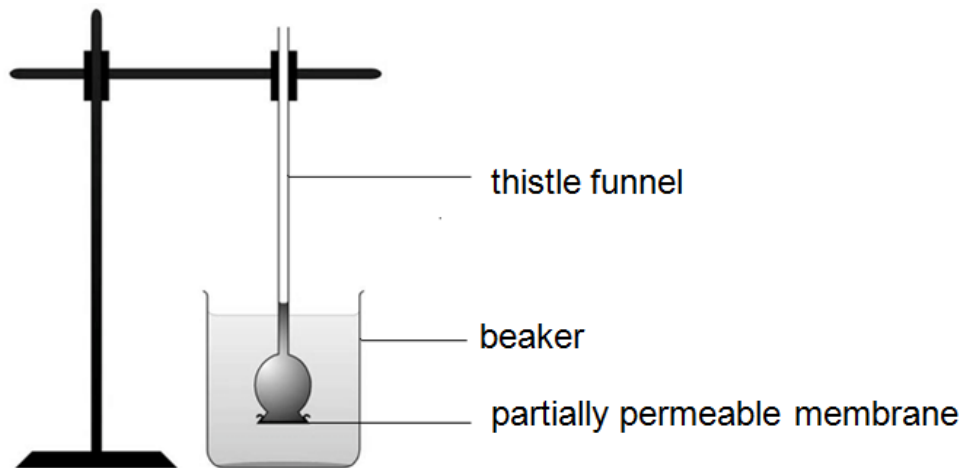
2 The diagram shows a plant cell.



Which features are also found in an animal cell?

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

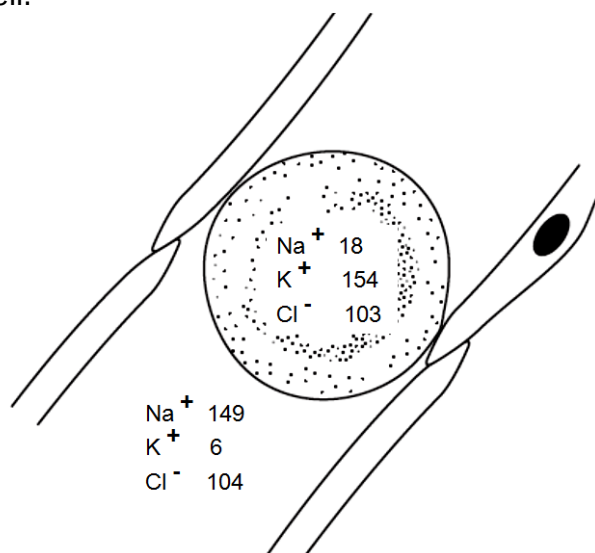
- 3 An experiment was set up as shown. After an hour, the liquid level in the thistle funnel increased.



Which row shows the possible solutions in the beaker and in the thistle funnel at the start of the experiment?

	beaker	thistle funnel
A	5% sucrose	distilled water
B	10% sucrose	5% sucrose
C	5% sucrose	10% sucrose
D	distilled water	distilled water

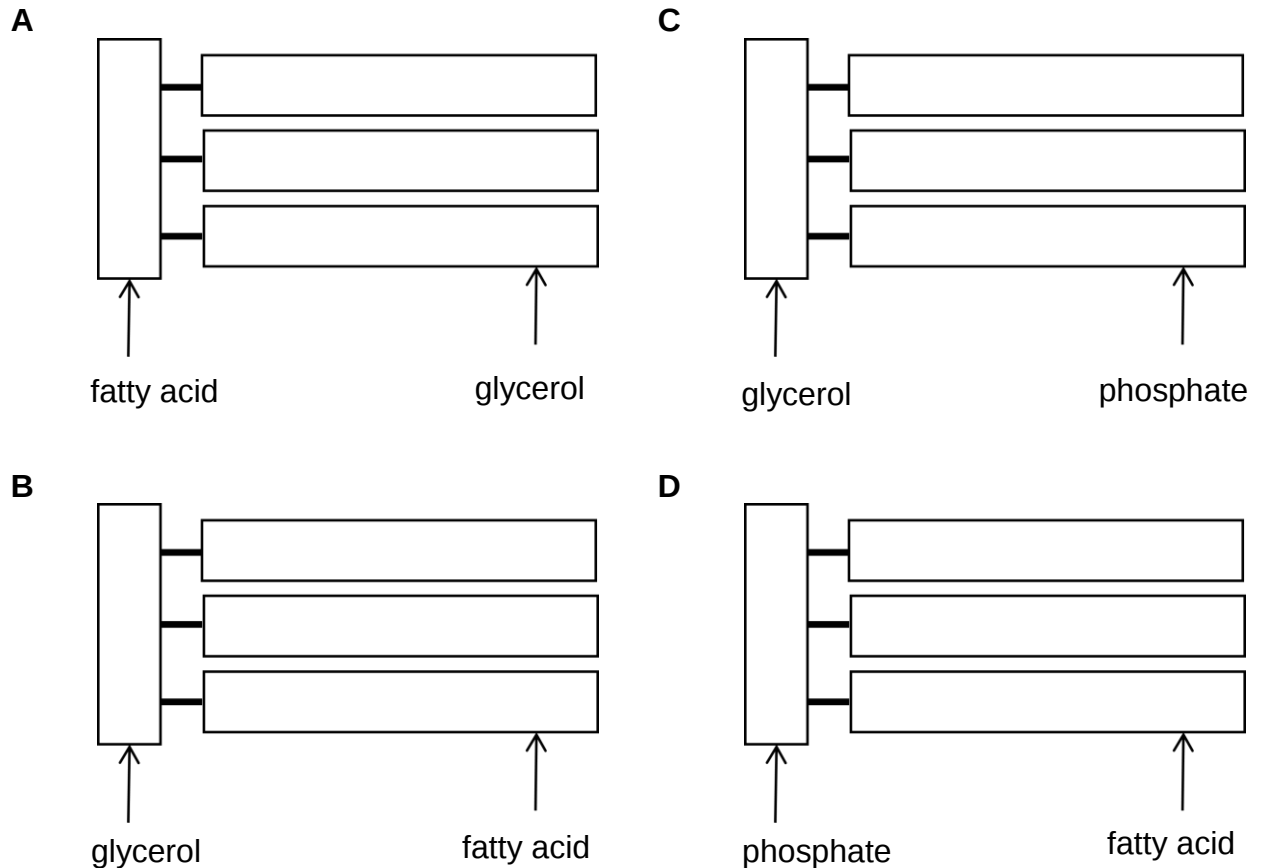
- 4 The diagram shows a red blood cell and the concentrations of different ions, in mol dm^{-3} , in the plasma and in the cell.



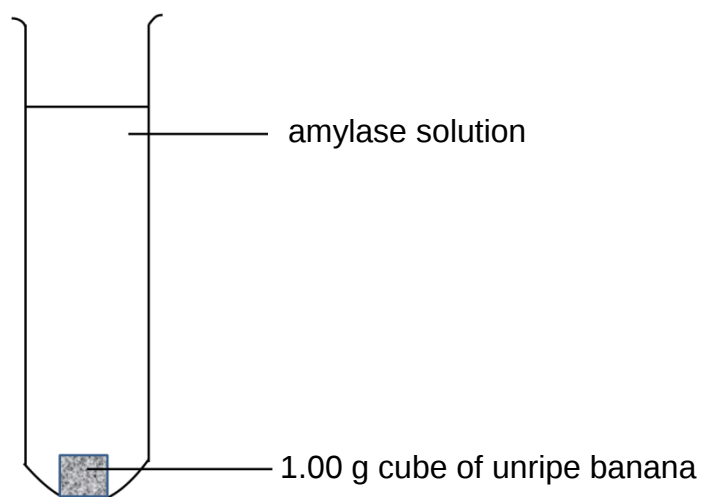
Which ions are actively transported into and out of the red blood cell?

	into red blood cell	out of red blood cell
A	Cl^-	Na^+
B	K^+	Cl^-
C	Na^+	K^+
D	K^+	Na^+

5 Which of the following diagrams represents a molecule of simple lipid?



6 The diagram shows an experiment to investigate the action of amylase on a 1.00 g cube of unripe banana. Unripe banana contains high starch content.



After 15 minutes at 20 °C, 0.25 g of starch has been converted to sugar. The experiment is repeated at 30 °C, how much starch is converted to sugar?

- A 0.15 g
- B 0.25 g
- C 0.45 g
- D 1.00 g

7 Four different foods were tested. Which results contained both protein and starch?

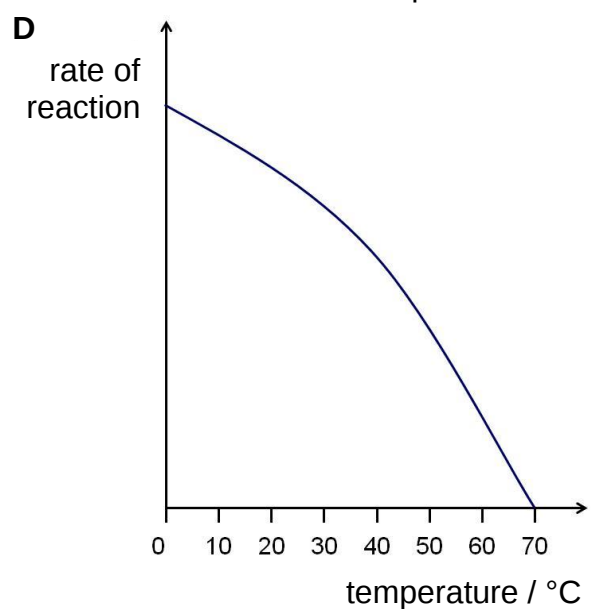
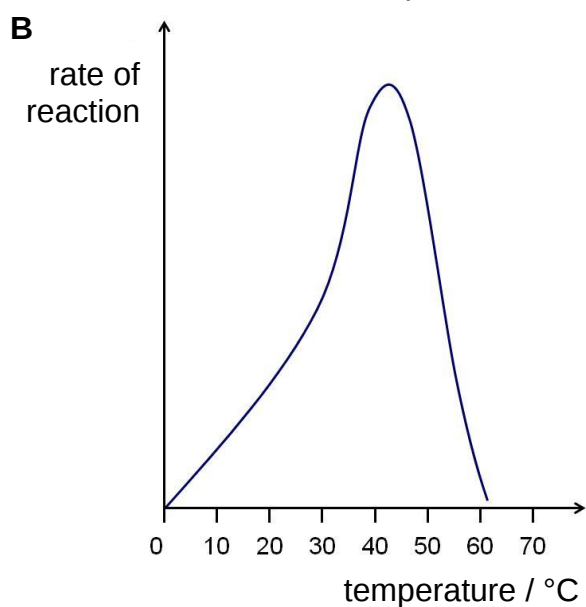
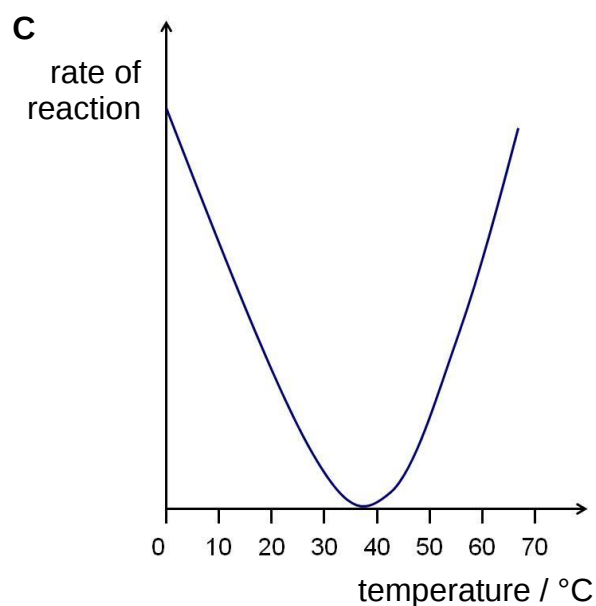
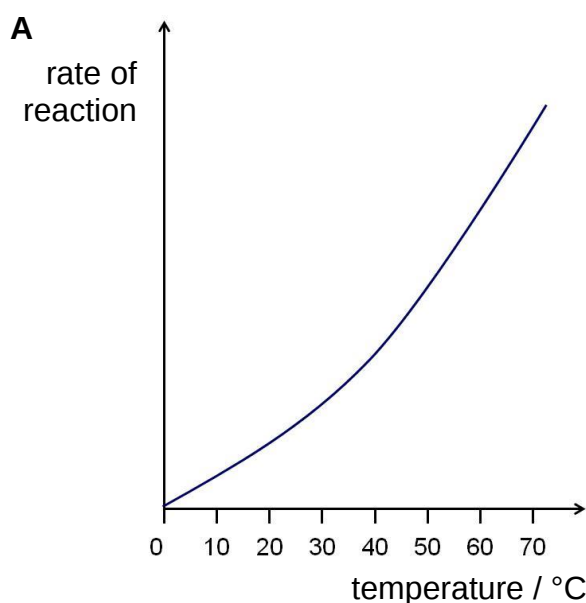
food	Benedict's test	biuret test	ethanol emulsion test	iodine test
A	+	+	-	-
B	+	-	+	-
C	-	+	-	+
D	-	-	+	+

Key

+ = positive result

- = negative result

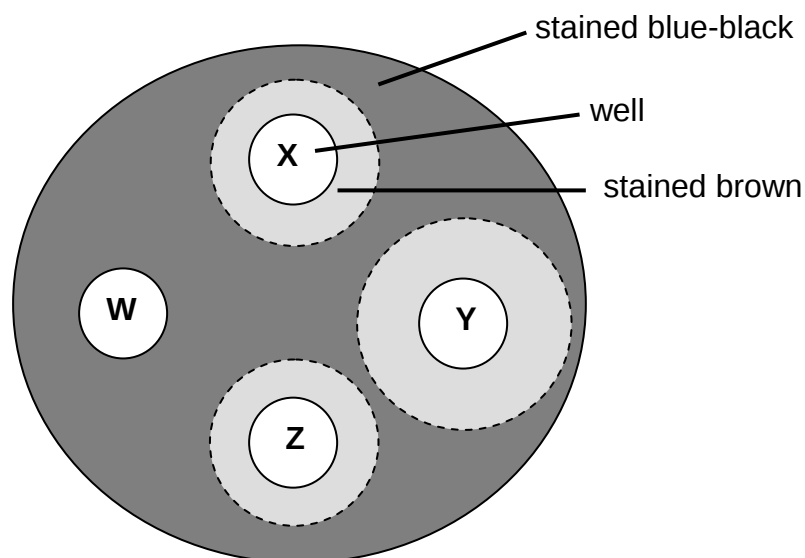
8 Which graph shows the effect of temperature on the rate of an enzyme-catalysed reaction?



- 9 Four wells were created in an agar plate infused with starch. The wells were filled with four different solutions - I, II, III, and IV.

solution	condition
I	salivary amylase + pH 5.0
II	salivary amylase + pH 2.0
III	salivary amylase + pH 7.5
IV	salivary amylase + pH 6.5

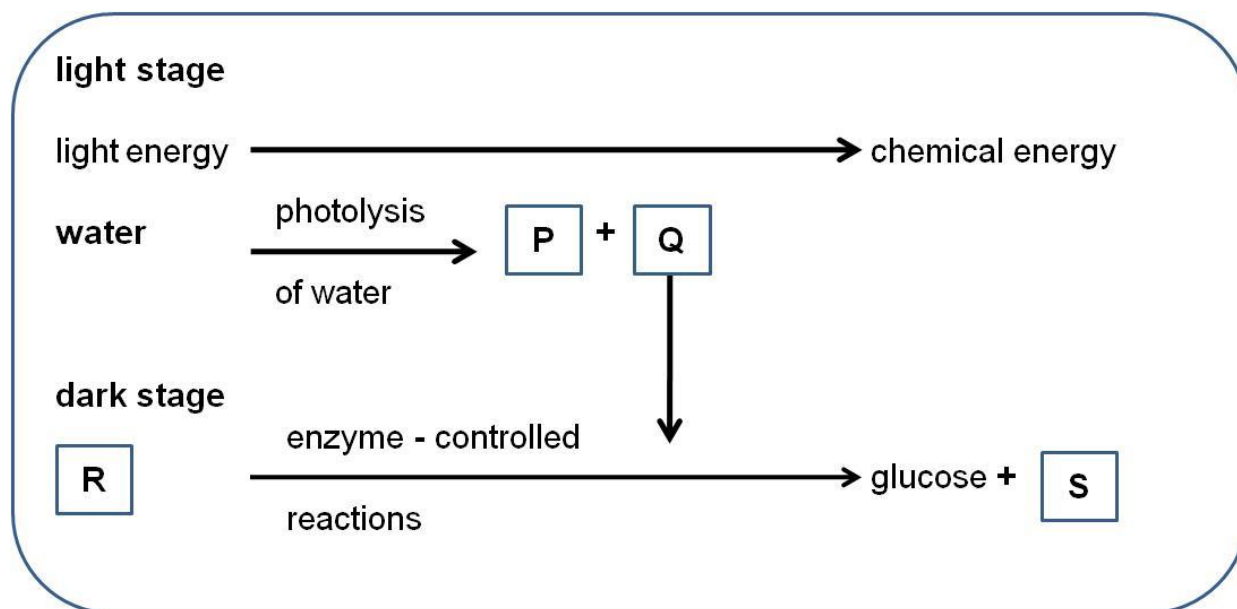
After three hours, the agar plate was bathed in iodine solution. The result is shown.



Which row shows the correct matching of the solutions to the wells?

	W	X	Y	Z
A	I	II	III	IV
B	IV	I	II	III
C	III	IV	I	II
D	II	III	IV	I

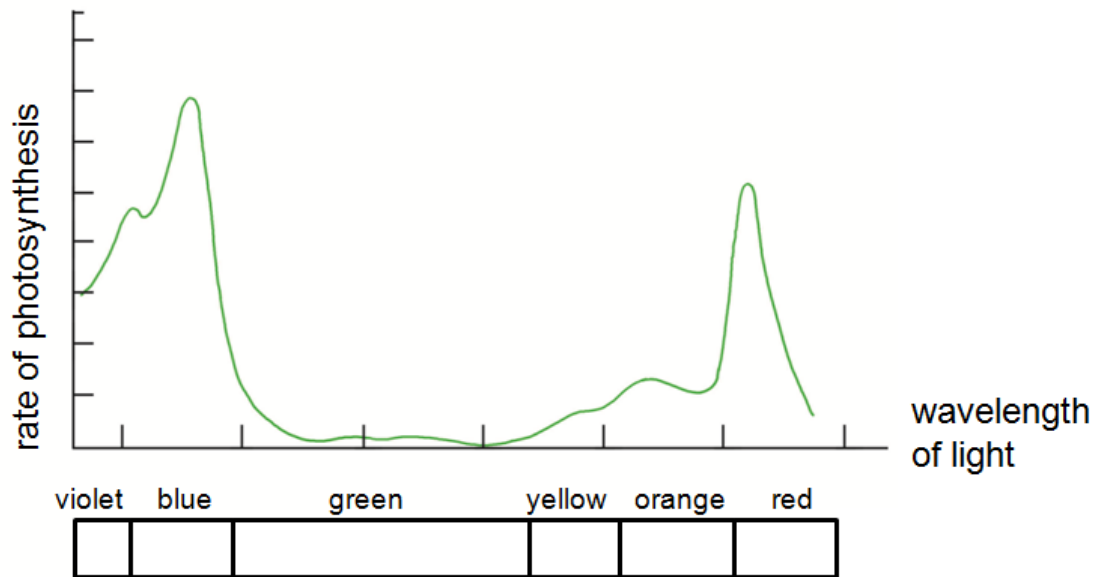
10 The diagram shows how one molecule of glucose is formed during photosynthesis.



Which of the following represents P, Q, R and S?

	P	Q	R	S
A	oxygen	hydrogen ions	carbon dioxide	water
B	water	oxygen	hydrogen ions	carbon dioxide
C	carbon dioxide	water	oxygen	hydrogen ions
D	hydrogen ions	carbon dioxide	water	glucose

Questions **11** and **12** refer to the graph below. Pigment **X** is a photosynthetic pigment. The graph shows the wavelength of light used by pigment **X** during photosynthesis.



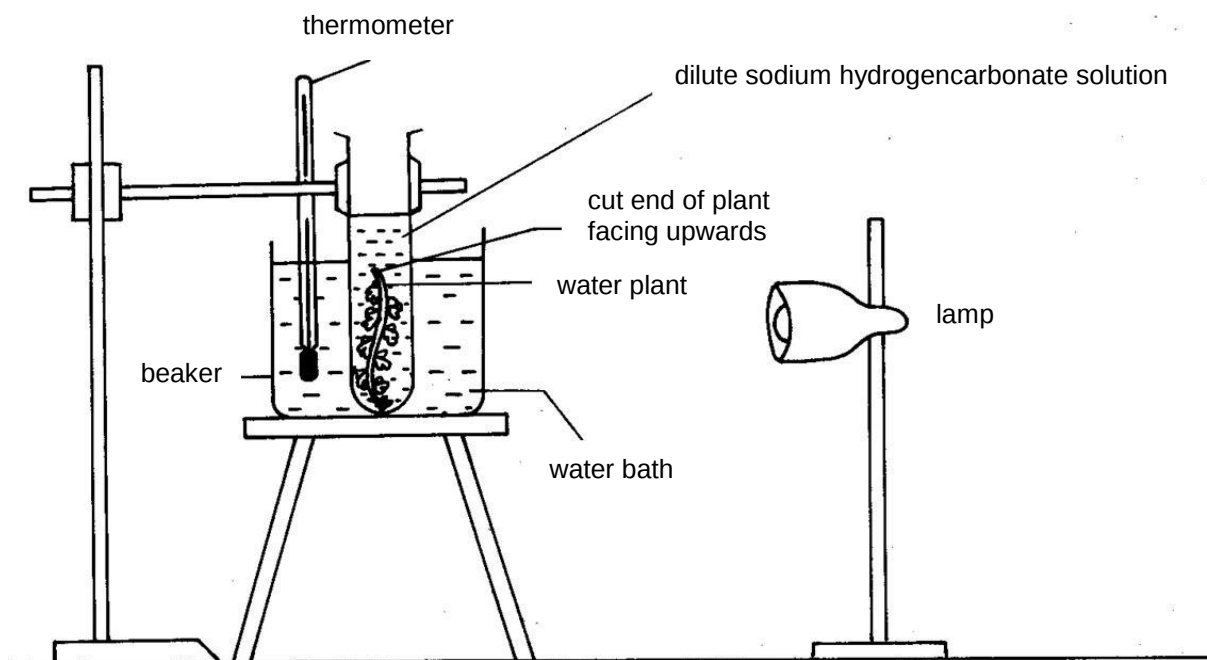
11 Which two regions of the spectrum are most absorbed by pigment **X**?

- A** blue and red
- B** orange and red
- C** blue-green and orange
- D** blue-green and violet

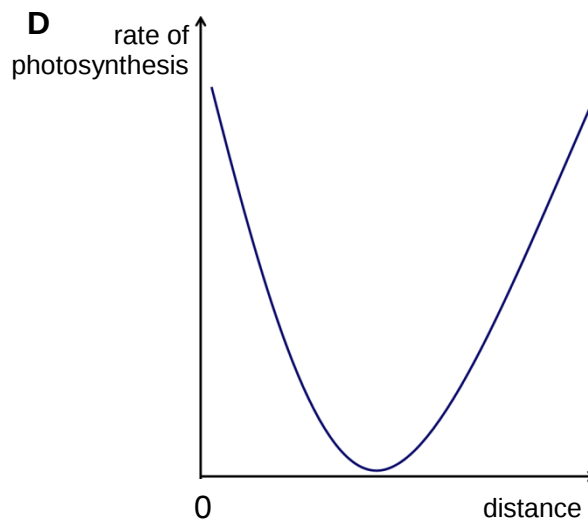
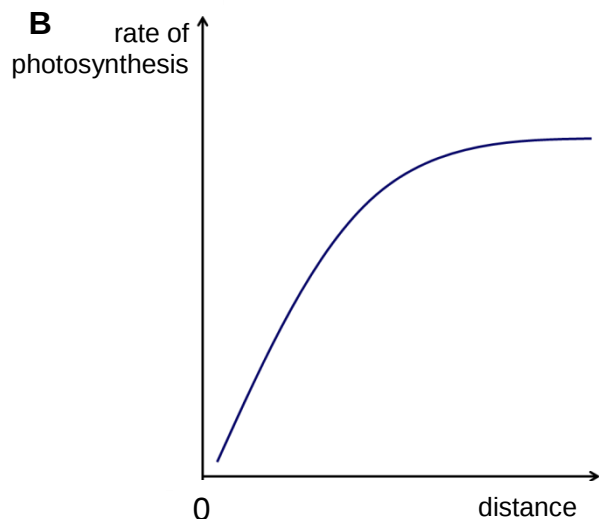
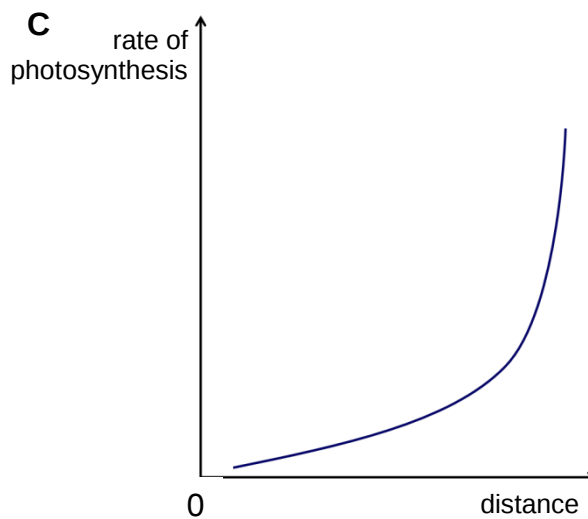
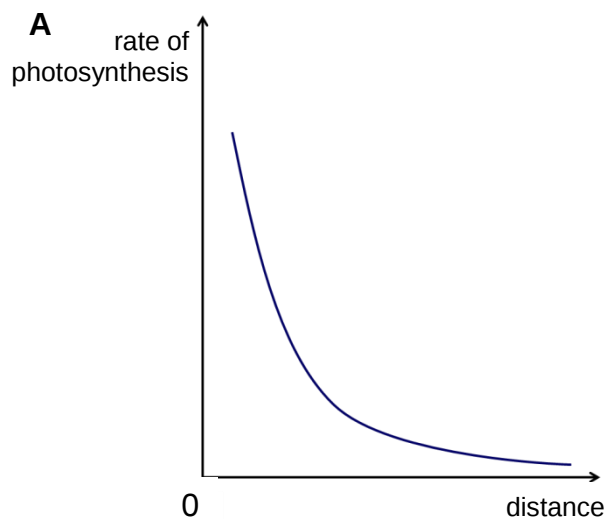
12 Which region is almost never absorbed?

- A** blue
- B** green
- C** yellow
- D** violet

- 13** The diagram shows an investigation on the effect of different light intensities on the rate of photosynthesis.

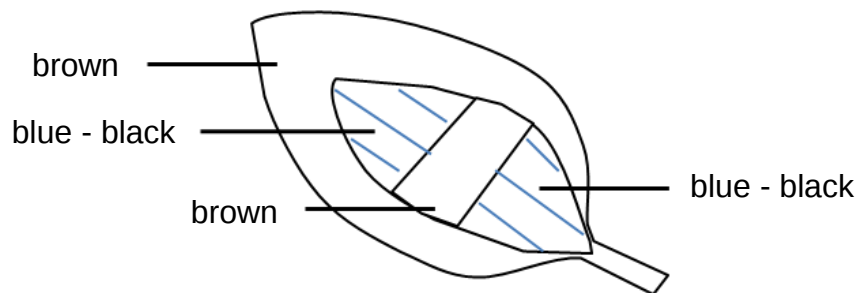


Which graph shows how the rate of photosynthesis varies with the distance between the water plant and the lamp?



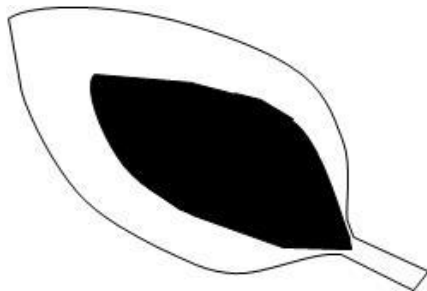
- 14** A plant with variegated leaves is destarched with its leaves partially covered with black paper. Variegated leaves are leaves that have both dark and light green regions.

After a day, the leaves are tested for starch. The result is shown below.

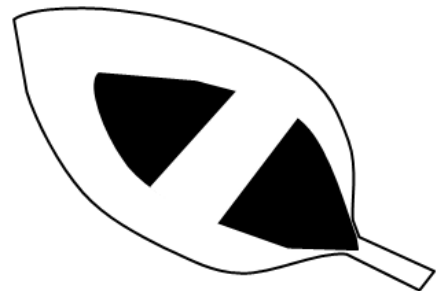


Which of the following shows the most likely position and shape of the black paper?

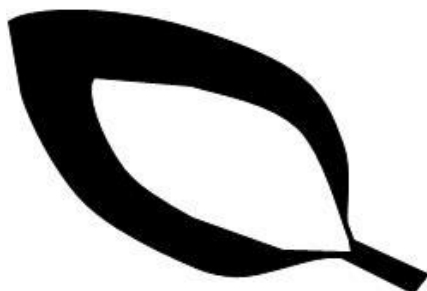
A



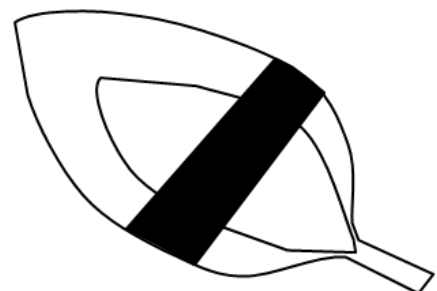
C



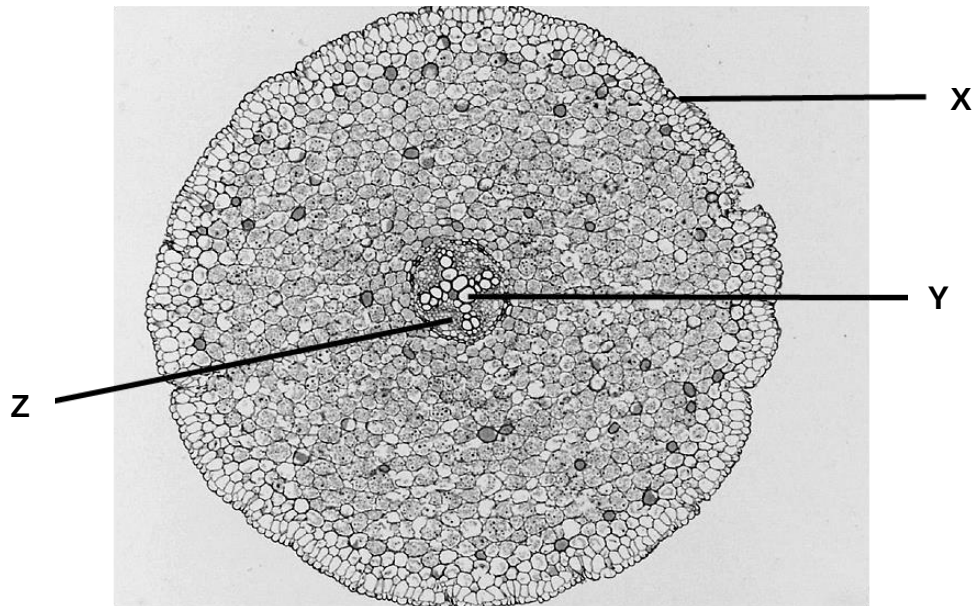
B



D



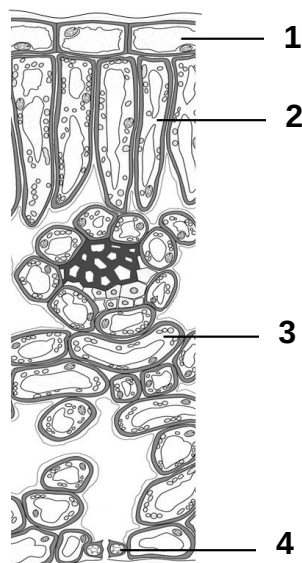
15 The photomicrograph shows a cross section of a buttercup root.



Which row represents X, Y and Z?

	X	Y	Z
A	endodermis	phloem	xylem
B	epidermis	xylem	phloem
C	phloem	xylem	endodermis
D	xylem	phloem	epidermis

16 The diagram shows a cross section of a leaf.

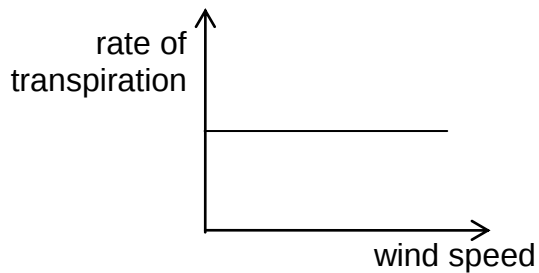


Which cells are able to photosynthesise?

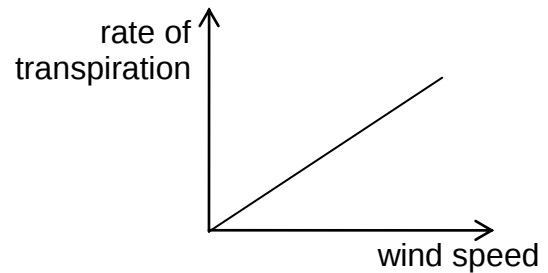
- A 1 and 2 only
- B 2 and 3 only
- C 2, 3 and 4 only
- D 1, 2, 3 and 4

17 Which graph shows how the rate of transpiration varies with wind speed?

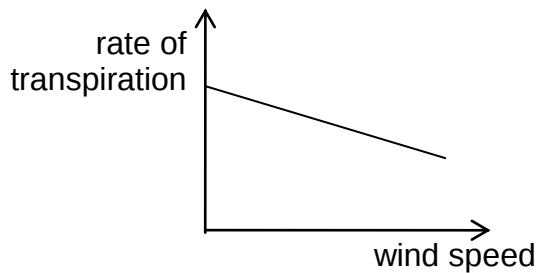
A



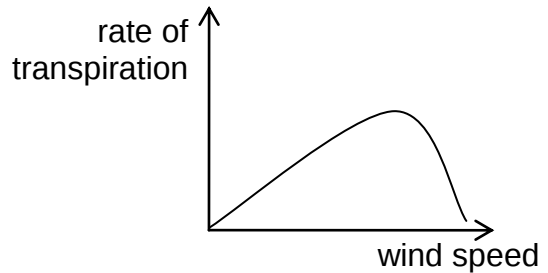
C



B



D



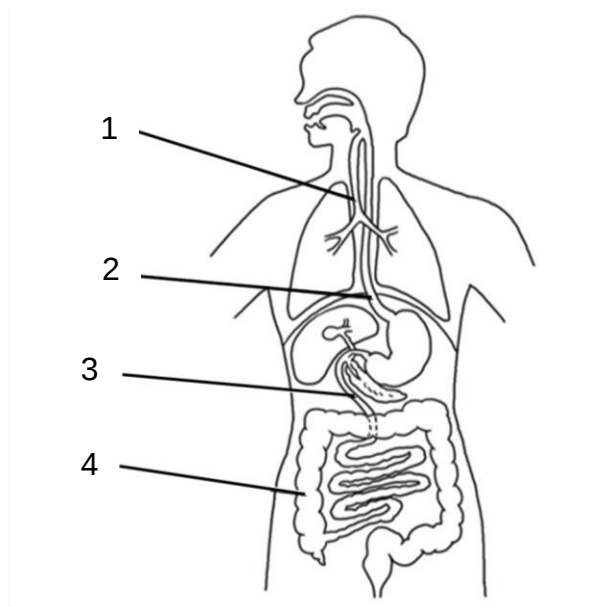
18 The table shows the results of an investigation, using a potometer, to measure the rate of water loss from a leafy shoot of a plant kept in different conditions in a room. The cross-sectional area of the capillary tube is 1.0 cm^2 .

condition	reading at 0 minute / cm	reading at 30th minute / cm
X = fan off, light off	0.1	0.6
Y = fan off, light on	0.1	0.8
Z = fan on, light on	0.1	1.1

What is the average rate of water loss in cm^3 per hour for each condition?

	X	Y	Z
A	0.3	0.4	0.5
B	0.6	0.8	1.1
C	1.0	1.4	2.0
D	1.2	1.6	2.2

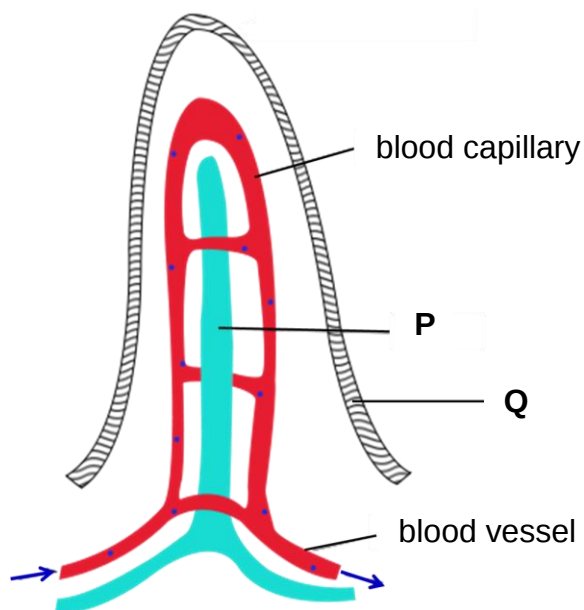
19 The diagram shows the internal anatomy of the human body.



Which of the following undergo peristalsis?

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

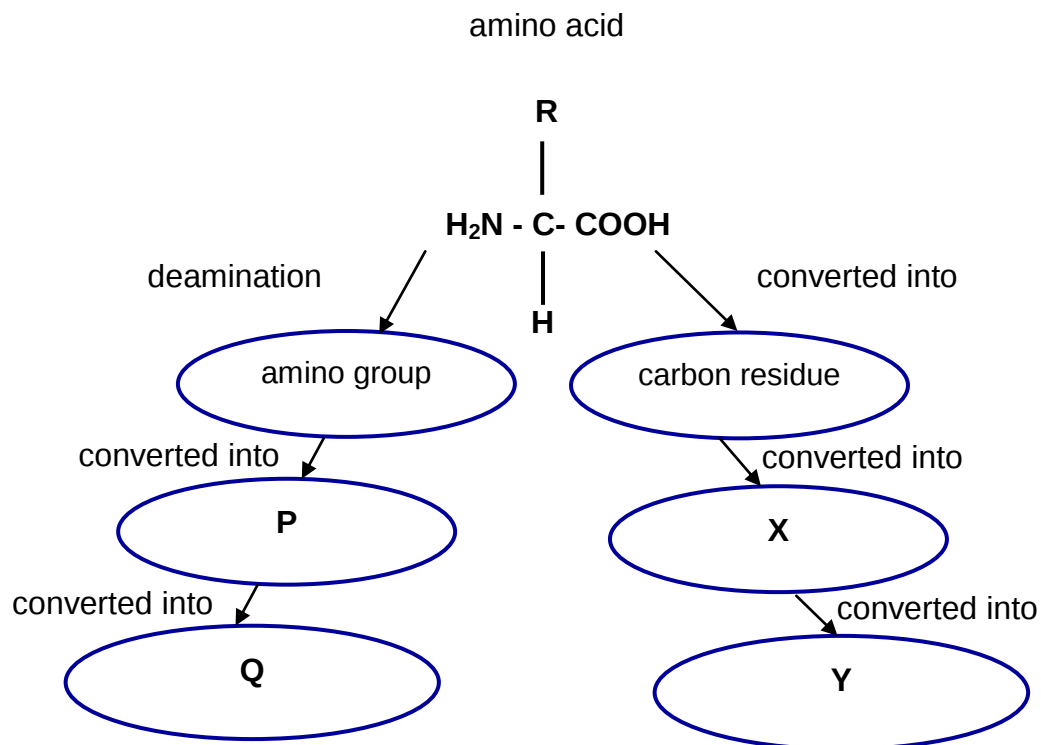
20 The diagram shows a section through an intestinal villus.



What are the functions of structures P and Q?

	P	Q
A	transports fats	absorbs nutrients
B	transports glucose	absorbs haemoglobin
C	transports water	absorbs bile
D	transports amino acids	absorbs vitamins

21 The diagram shows the fates of excess amino acids in the diet.



Which of the following shows products P, Q, X and Y correctly?

	P	Q	X	Y
A	ammonia	glucose	glycogen	urea
B	ammonia	urea	glucose	glycogen
C	glucose	glycogen	ammonia	urea
D	glycogen	urea	ammonia	glucose

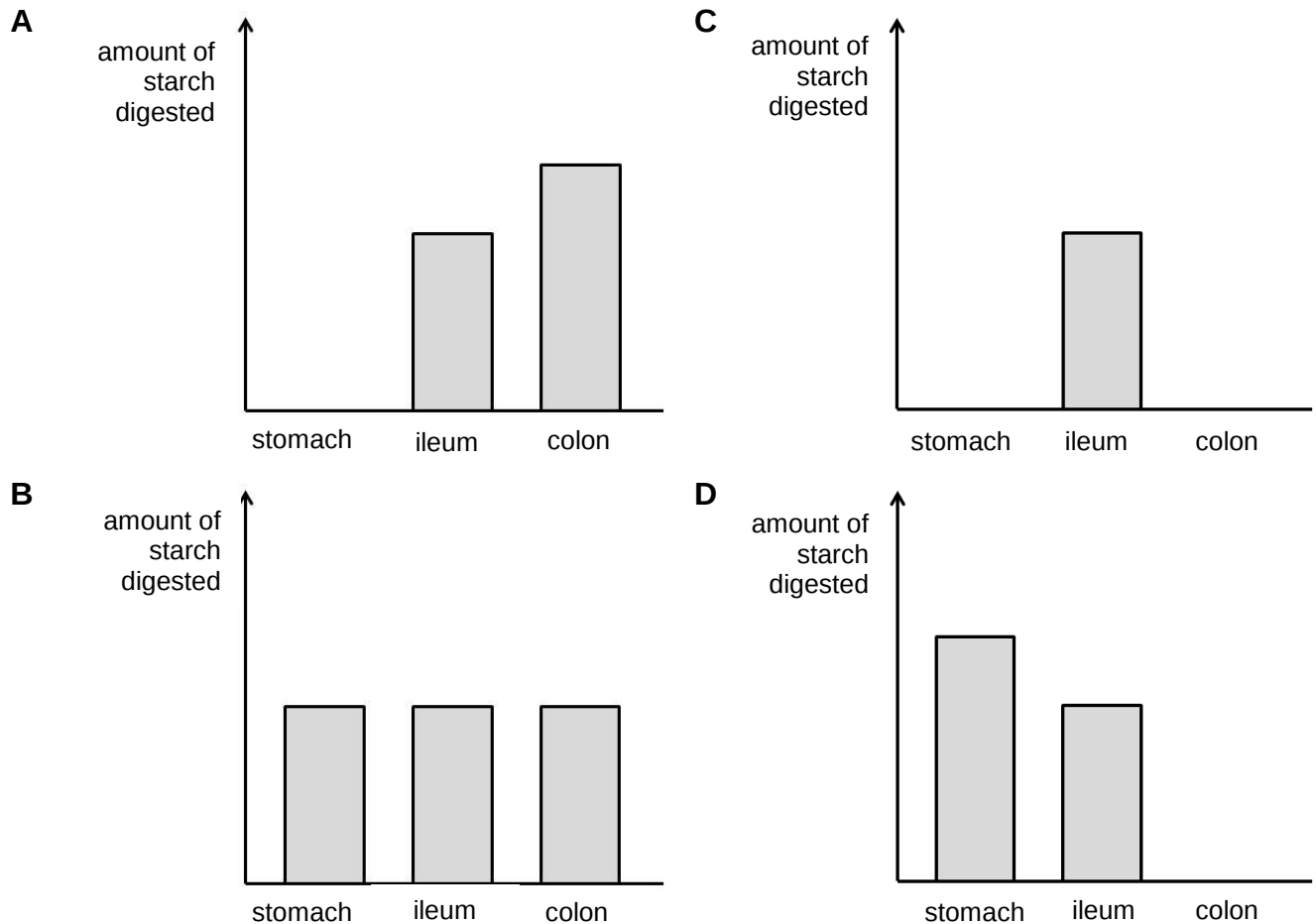
22 The table shows the absorption of products of digestion in the presence and absence of oxygen.

products of digestion	absorption in the presence of oxygen / arbitrary units	absorption in the absence of oxygen / arbitrary units
glucose	6.4	2.5
amino acids	5.7	1.9
glycerol	4.7	4.8
fatty acids	2.1	2.0

What conclusion can be drawn from the results?

- A** All products of digestion are absorbed by diffusion only.
- B** All products of digestion are absorbed by active transport only.
- C** Glucose and amino acids are absorbed by active transport.
- D** Glycerol and fatty acids are absorbed by active transport.

- 23** An investigation on digestion of starch from a cup of mashed potato was conducted. Treatments that mimic the conditions found in the stomach, ileum and colon were set up. The amount of starch digested occurring in these treatments –‘stomach’, ‘ileum’ and ‘colon’, was plotted in a bar chart. Which bar chart shows the correct amount of starch digested in the stomach, ileum and colon?



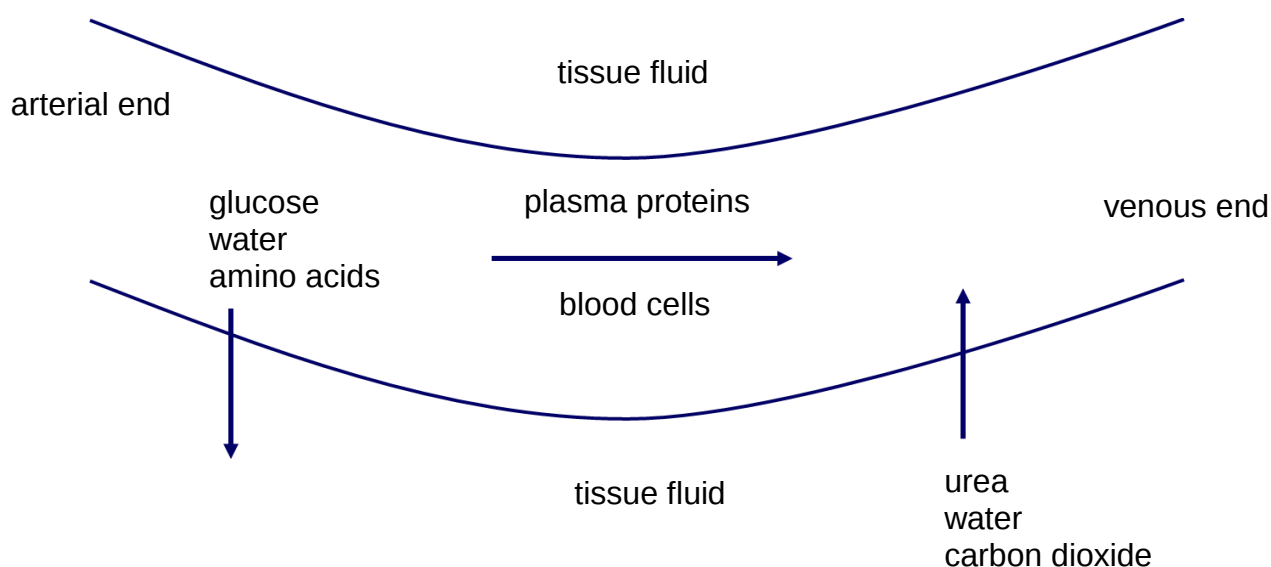
- 24** The table shows the blood groups of four recipients and the type of blood each received in a transfusion.

recipient	recipient's blood group	donor's blood group
R1	A	B
R2	B	O
R3	O	AB
R4	AB	A

Which two recipients are at risk of agglutination?

- A** R1 and R2
B R1 and R3
C R2 and R4
D R3 and R4

- 25** The arrows on the diagram show the direction of movement of some substances carried in plasma as they enter and leave a blood capillary.

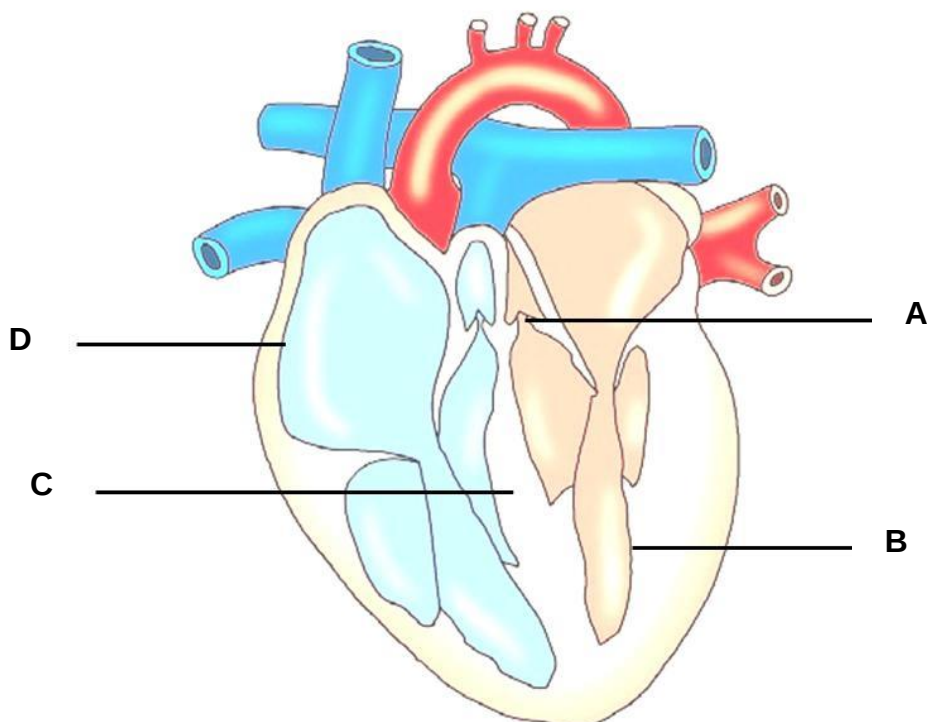


Which two factors help water to re-enter the capillary at the venous end?

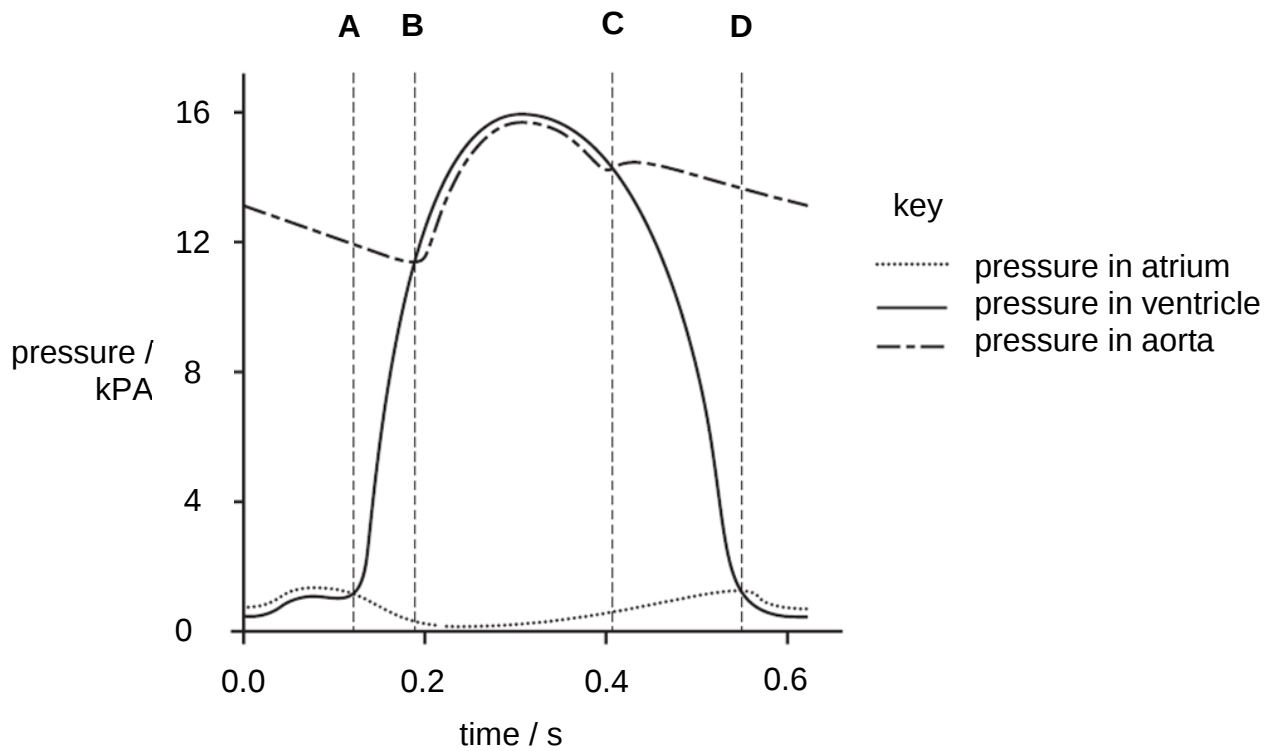
	plasma water potential	blood pressure in the capillary
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

- 26** The diagram shows a vertical section through the human heart.

Which structure separates oxygenated blood from deoxygenated blood?



Questions **27** and **28** refer to the graph below. The graph shows pressure changes in the left side of the heart, while at rest, during a single heart beat.

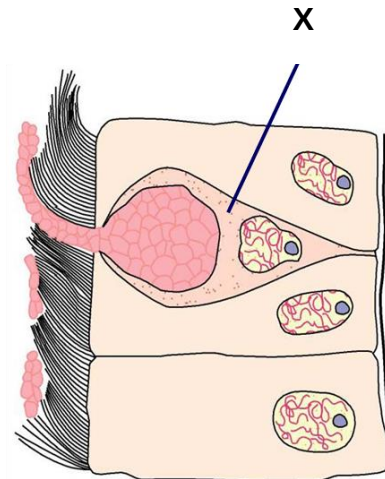


27 At which point, A, B, C or D, does the semi-lunar valve close?

28 What is the heart rate of this person while at rest?

- A** 60
- B** 75
- C** 90
- D** 100

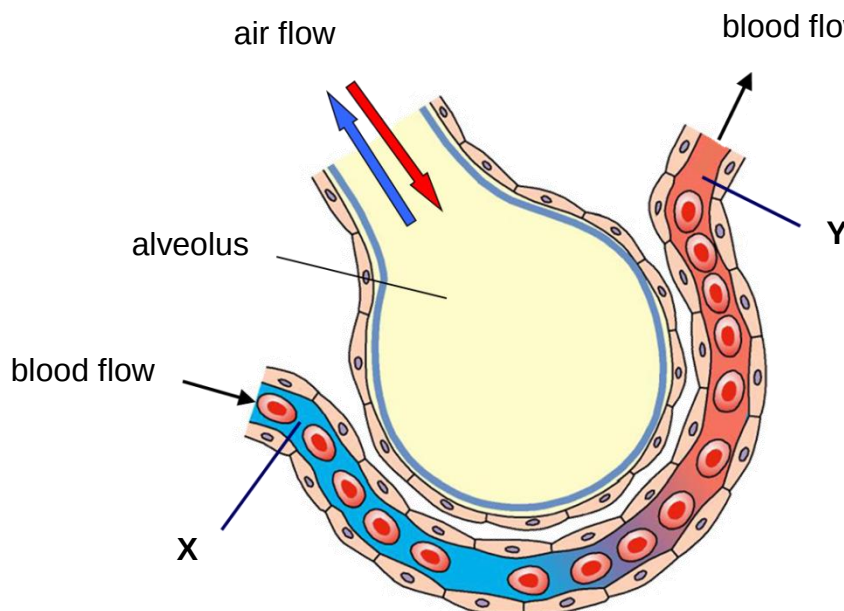
29 The diagram shows part of the lining of the human trachea.



Which is the function of X?

- A** phagocytosis
- B** gaseous exchange
- C** mucus removal
- D** secretion of mucus

30 The diagram shows a section through an alveolus and a blood capillary.



What are the concentrations of gases at X and Y?

	oxygen at X	carbon dioxide at Y
A	high	high
B	high	low
C	low	high
D	low	low

End of paper