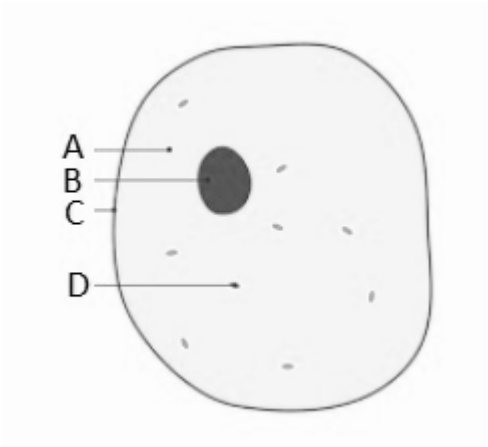
MULTIPLE CHOICE QUESTION

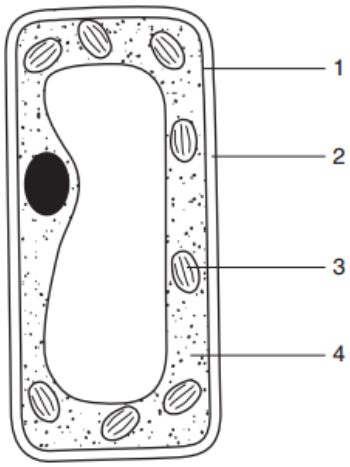
1. Which option lists structures that are found in animal cells?

	Cell Wall	Large central vacuole	Chromosome	Cytoplasm	Cell membrane
A	Absent	Absent	Absent	Present	Present
B	Present	Absent	Present	Present	Present
C	Absent	Absent	Present	Present	Present
D	Absent	Present	Present	Present	Absent

2. The diagram below shows an animal cell, which structure controls movement in and out of cell?



3. The diagram below shows a cell.



Which statement about this cell is true?

A The diagram shows an animal cell because structure 3 is present
B The diagram shows a plant cell because it does **not** contain large central vacuole
C Structure 2 is the cell wall and structure 3 is a chloroplast
D Structure 4 is the cytoplasm and structure 3 is a nucleus

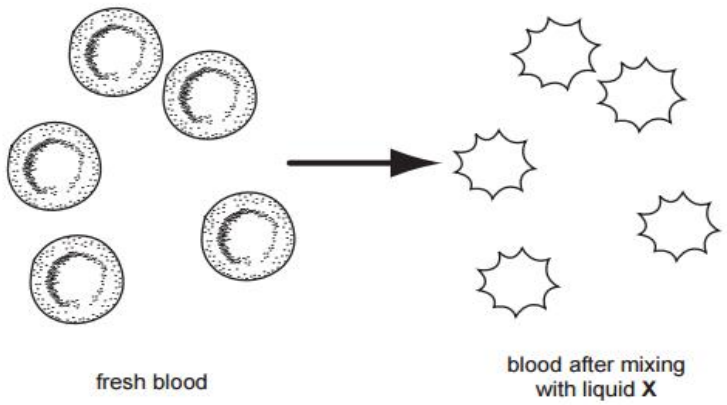
4. What causes water to enter the roots of a plant from the soil?
A Water potential in the roots is lower that in the soil
B Water potential is the same for the roots and the soil
C Water potential is higher in the roots
D Water potential is lower in the soil
5. The diagram below shows a plant cell.

What is the function of this cell?

A Provides support to the plant
B Manufactures glucose by photosynthesis
C Contracts and provide movement for the plant
D Absorbs water and minerals from the soil

6.The concentration of nitrate ions in a root cell is higher than in the surrounding soil solution. How do the nitrate ions move into the root cell?
A active transport
B diffusion
C osmosis
D transpiration

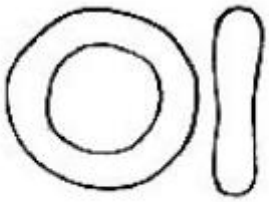
7. The diagram below shows the results after mixing fresh red blood cell with liquid X.



Which statement best describes this result:
A Water moved into the cell as water potential inside was lower
B Water moved out of the cell as water potential of liquid X was lower
C Water moved out of the cell as water potential of liquid X was higher
D Water moved into the cell as the water potential of liquid X was higher

8. Which of the following process involves a partially permeable membrane
A Osmosis only
B Diffusion and osmosis
C Diffusion only
D Neither diffusion nor osmosis

9. The drawing below shows a red blood cell



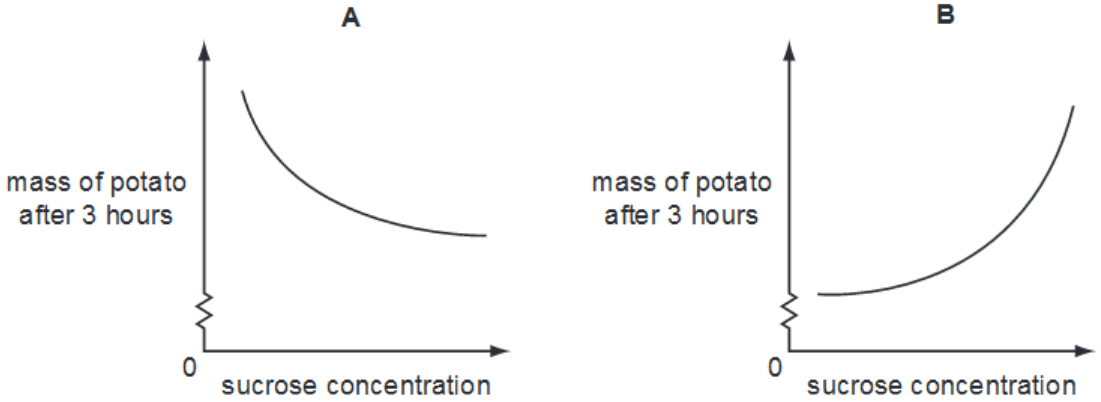
Front and side
view of a red blood cell

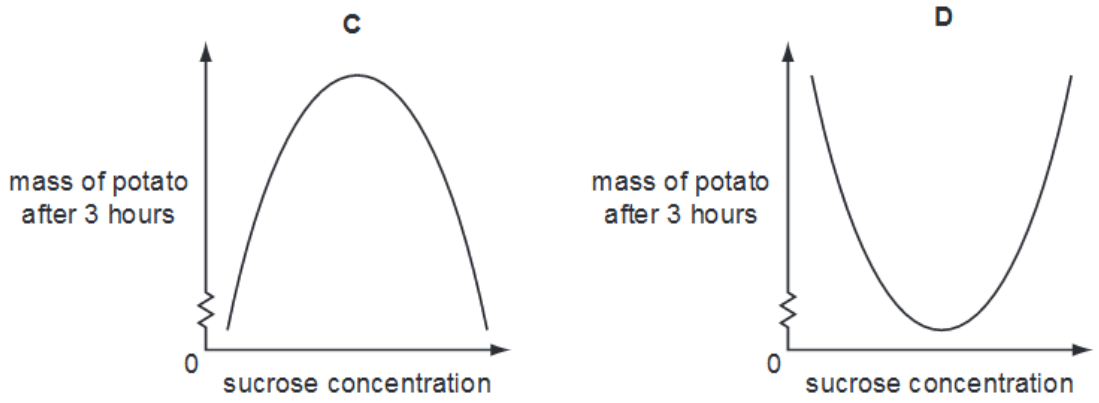
Which advantage does this shape give to the cell.

A The cell is flat and small and can easily pass out of the veins
B The biconcave shape increases the surface area to volume ratio for rapid absorption of oxygen
C The cell has a thick cell wall preventing it to burst
D The biconcave shape enables the cell to squeeze out of the capillaries

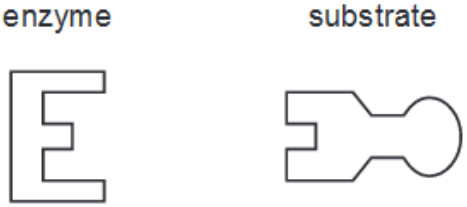
10. Which of the following processes require energy
A Diffusion and osmosis
B Active transport and osmosis
C Diffusion only
D Active transport only

11. Identical pieces of potatoes are placed in different concentration of sucrose solutions. After 3 hours, the mass of each piece is recorded. Which graph best describes the results after 3 hours?





12. The diagram shows the 'key and lock' mechanism for an enzyme whose optimum temperature is 40°C.



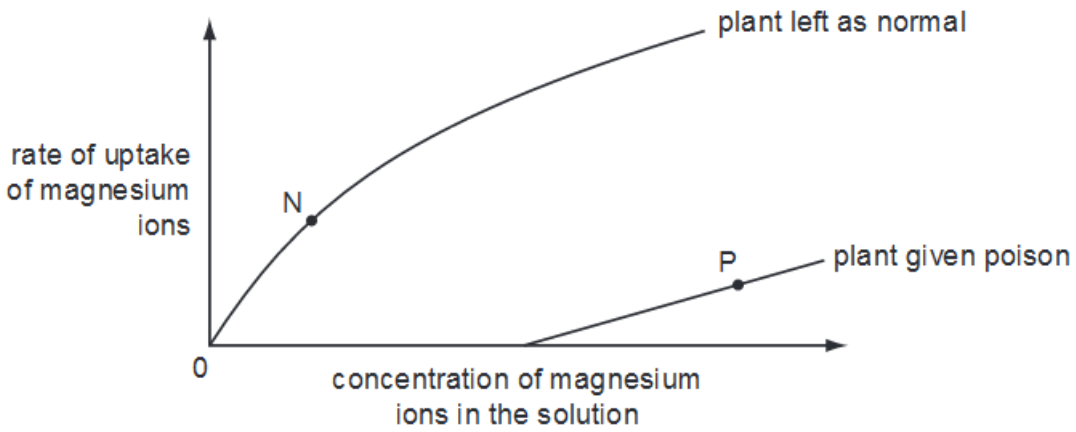
What happens to the substrate and the enzyme if the temperature is raised at 70°C?

	enzyme	substrate
A		
B		
C		
D		

13. Which element is present in fats, proteins and carbohydrate?

A Carbon, hydrogen and nitrogen
B Nitrogen, carbon and oxygen
C Oxygen, hydrogen and nitrogen
D Carbon, hydrogen and oxygen

14. An experiment measured the rate at which plants take up magnesium ions from solution. One plant was given a poison that stops respiration. Another plant was left as normal. The graph shows the results.



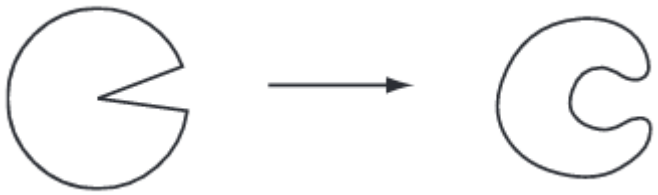
How are the magnesium ions being absorbed by the plants at points N and P.

	point N	point P
A	active transport	active transport
B	active transport	diffusion
C	diffusion	active transport
D	diffusion	diffusion

15. The action mechanism of an enzyme can be explained by the 'lock and key' hypothesis. Where is the active site and which one acts as the key or the lock?

	Active site	**Key or lock**
A	On the substrate	The enzyme acts as the key
B	On the substrate	The enzyme acts as the lock
C	On the enzyme	The substrate acts as the lock
D	On the enzyme	The substrate acts as the key

16. The diagram below shows the change in shape of an enzyme molecule.



What explains this change
A The enzyme has been placed in a water bath at 5°C
B The enzyme has been placed in a concentrated sugar solution
C The enzyme has been placed in a water bath at 100°C
D The enzyme has been placed in a dilute sugar solution

17. For which food test must the sample be heated?
A Reducing sugars
B Fats
C Proteins
D Starch

18. Four different foods were tested as shown below and the test were recorded as positive(+) or negative(-). Which food tested contained both glucose and oil?

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

19. Four test-tubes containing egg white are incubated for ten minutes at 35 °C. Different substances are then added to the four test-tubes. In which test-tube is the egg white first digested?

	substances added
A	1 cm^3 lipase solution and three drops of sodium hydroxide solution
B	1 cm^3 protease solution and three drops of dilute hydrochloric acid
C	1 cm^3 protease solution and three drops of water
D	1 cm^3 lipase solution and three drops of water

20. What are the functions of the xylem?

	carrying sugars	carrying water	carrying mineral ions	giving support
A	✓	✗	✗	✓
B	✓	✓	✗	✗
C	✗	✓	✓	✗
D	✗	✓	✓	✓

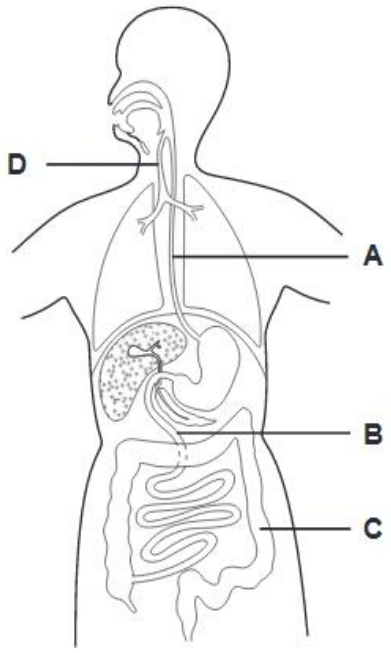
key
✓ = a function of xylem
✗ = not a function of xylem

21. Which statement best describes the importance of water in a diet.
A Water is important as it is a major constituent of bones and teeth
B Water provides bulk for peristalsis along the digestive tract
C Water is important as it maintain healthy tissues
D Water acts a solvent for substances and a medium for reactions

22. The table shows the nutrients in different parts of a meal. Which food would be most useful in preventing constipation?

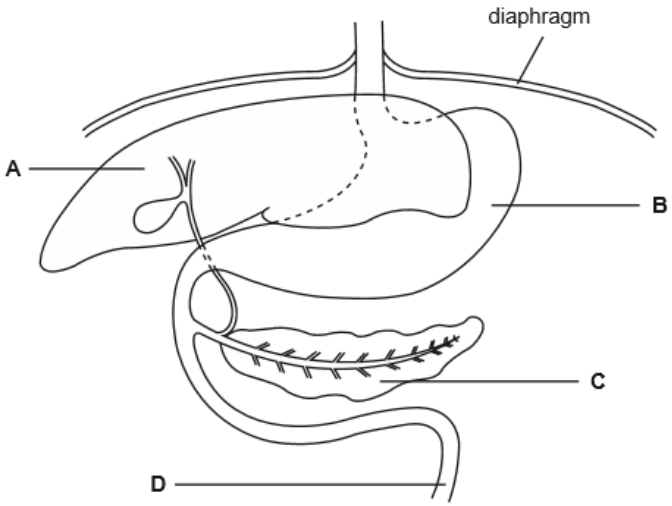
	food	energy kJ	protein g	fat g	carbohydrate g	fibre g
A	apple juice	163	0.1	0	9.4	0
B	ripe banana	466	1.5	0.4	27	4.9
C	salad sandwich	1054	19	7.3	27	6.1
D	toffee bar	458	2.1	3.3	19	1.1

23. The diagram shows some organs of the human body.
Which structure does **not** move its contents by peristalsis?

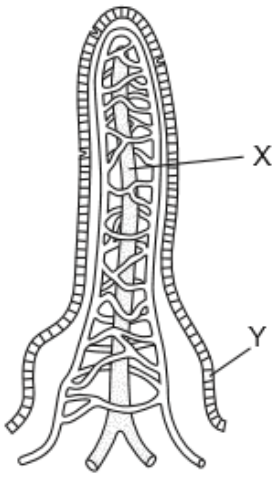


24. In which order does these events occur in human nutrition?
A Digestion→ ingestion→ absorption→ assimilation
B Digestion→ ingestion→ assimilation→ absorption
C Ingestion → digestion→ absorption→ assimilation
D Ingestion→ digestion→ assimilation→ absorption

25. The diagram shows part of the human digestive system.
Which part secretes an acidic digestive juice containing a protease?



26. The diagram shows a section through a villus.



What is the function of structure X and structure Y?

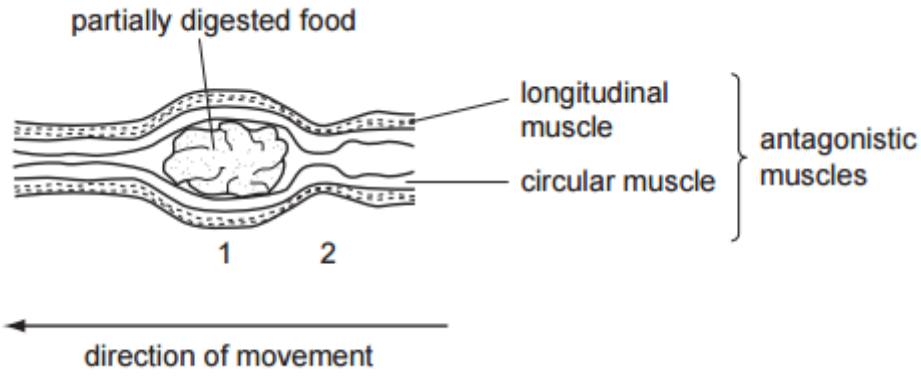
	X	Y
A	to absorb amino acids	to digest starch
B	to carry blood	to secrete mucus
C	to transport fats	to secrete enzymes
D	to transport glucose	to help peristalsis

27. Only two of the following statements accurately describes what happens in the mouth.

1 Amylase breaks down large starch molecules into smaller maltose molecules.
2 Chewing increases the surface area of food for digestion.
3 Saliva emulsifies fats into smaller droplets.
4 Teeth break up large insoluble molecules into smaller soluble molecules.

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

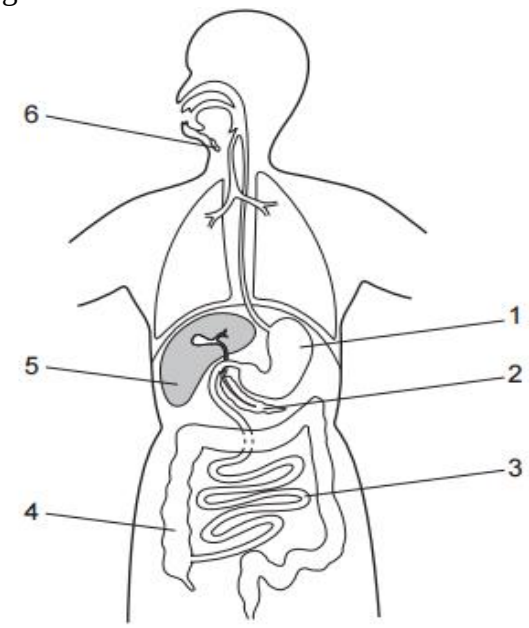
28. The diagram shows a section of the small intestine in which partially digested food is being pushed along.



What is the state of the longitudinal muscles at 1and 2?

	1	2
A	contracted	contracted
B	contracted	relaxed
C	relaxed	contracted
D	relaxed	relaxed

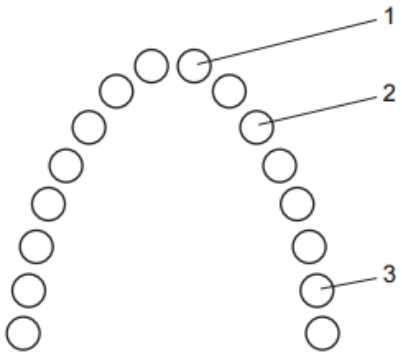
29. The diagram shows the human gut.



Which numbered structures secrete digestive enzymes?

A 1, 2, 3 and 4
B 1, 2, 3 and 6
C 2, 3, 4 and 5
D 2, 3, 5 and 6

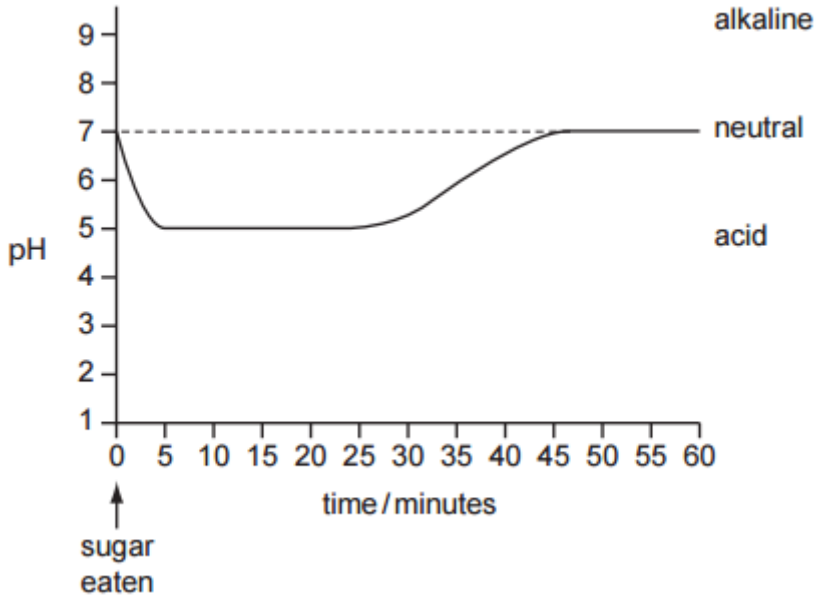
30. The diagram shows the position of the teeth in a human jaw.



Which teeth are found at the positions numbered 1, 2 and 3?

			
A	1	2	3
B	2	3	2
C	2	1	3
D	3	2	1

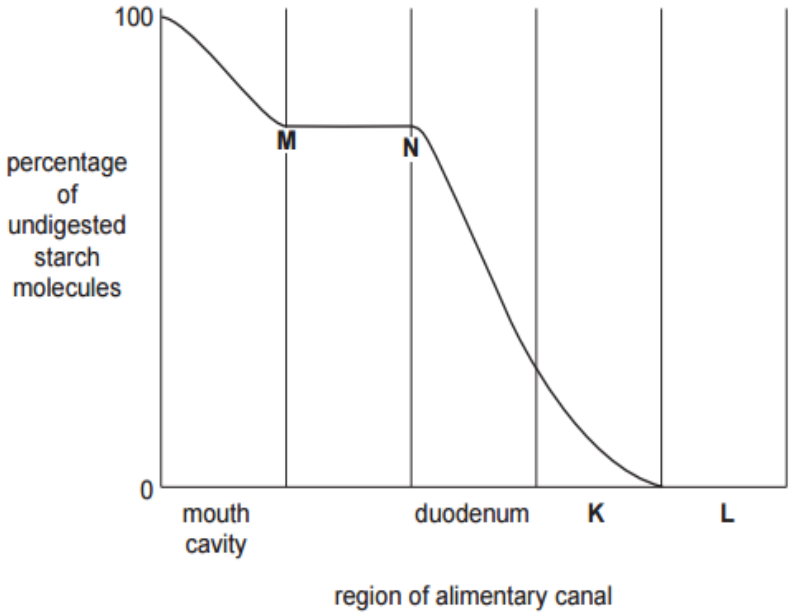
31. The graph shows the pH of the saliva in the mouth after eating sugar.



When are conditions in the mouth most likely to cause tooth decay?

A 0-5 minutes
B 5-25 minutes
C 25-45 minutes
D 45-60 minutes

32. The figure below shows the percentage of undigested molecules of starch as they pass through the alimentary canal.



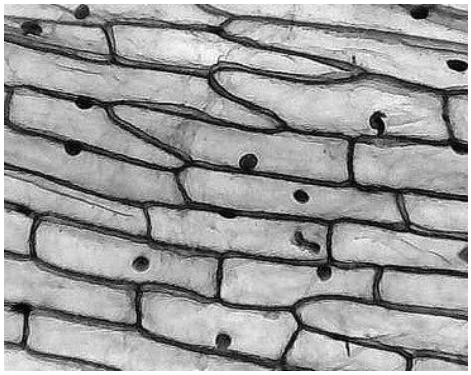
Which best describes what happened in region between M and N.

A The digestion of starch is stopped by the high temperature
B The digestion of starch is stopped by the low pH
C The digestion of starch is stopped as there is no more starch
D The digestion of starch is stopped by the low temperature

33. A lack of which nutrient causes gum to bleed?

A Vitamin C
B Vitamin A
C Iron
D Vitamin D

34. The photomicrograph shows onion epidermis



Which term describes this onion epidermis?

A cell
B organ
C organ system
D tissue

35.What are the advantages of chewing food at the start of digestion?

	increasing surface area	lubricating food	making food soluble
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✗	✓

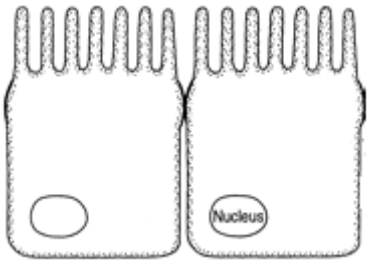
36. A protein solution is tested using three different reagents. Which set of results is obtained?

	iodine solution	Benedict's solution	biuret solution
A	black	blue	blue
B	black	red	blue
C	brown	blue	purple
D	brown	red	purple

37. Caseinogen is the protein found in milk. Since it is very soluble, it is difficult for the stomach to digest it. Which statement describes the process that speeds up the digestion of casein in the stomach?

A The caseinogen is converted to insoluble casein by the enzyme amylase
B The caseinogen is converted to insoluble casein by the enzyme renin
C The caseinogen is mixed with bile to form insoluble casein
D The caseinogen is mixed with bile to form tiny droplets

38. The figure below show the cells lining the ileum.



Which statement about these cells is correct?

A They have a biconcave shape that increases the surface area
B They secrete pancreatic juices that contain enzymes that speed up digestion
C They possess microvilli that contract to move the food along the digestive tract
D They possess microvilli that increase the surface area to volume ratio for faster absorption

39. What is egestion?

A Egestion is the process whereby undigested food like dietary fibres is removed through the anus
B Egestion is the process of taking in food and drinks in the mouth
C Egestion is the process of breaking down large nutrient particles into smaller ones
D Egestion is the process whereby the nutrients pass through the small intestine into the blood

40. What is meant by deamination and where does it occur?

A Deamination is the destruction of toxic substances that occurs in the liver
B Deamination is the destruction of excess amino acids that occurs in the liver
C Deamination is the destruction of excess amino acids that occurs in the pancreas
D Deamination is the destruction of toxic substances that occurs in the pancreas

[Total marks: 40]

Paper2
Section A- Structured questions

1. Figure 1 shows a plant cell.

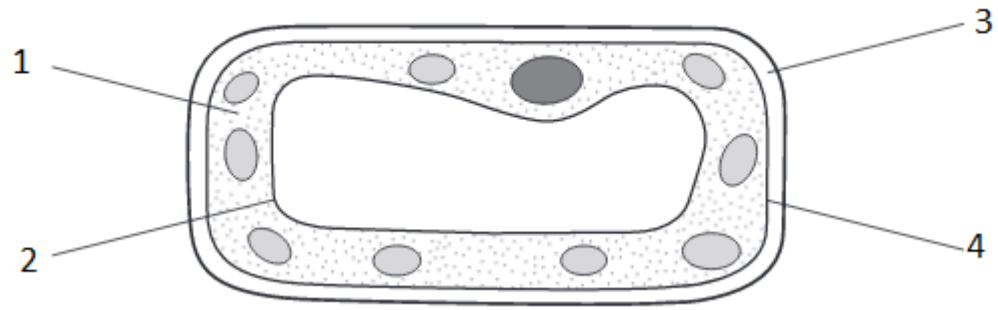


Figure 1

(a) Name structures 1 to 4.
1 ……..
2 ……...
3 ……
4 ……....

[4]

(b) Which two structures are selectively permeable? [2]

(c) Draw and label the above cell to show what you expect to see if this cell is placed in a concentrated solution.

[4]

[Total:10]

2. Figure 2 shows a specialised cell.

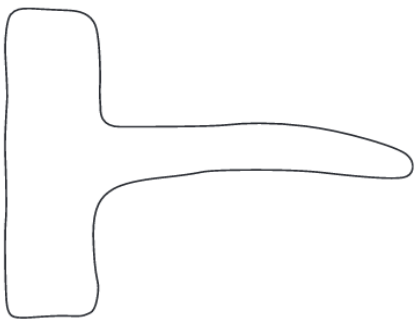


Figure 2

(a) List the chemicals absorbed by this cell. [2]
(b) Describe how this cell is adapted for its function. [2]

[Total: 4]

3. Figure 3 represents dramatically the action of two enzymes on their specific substrate.

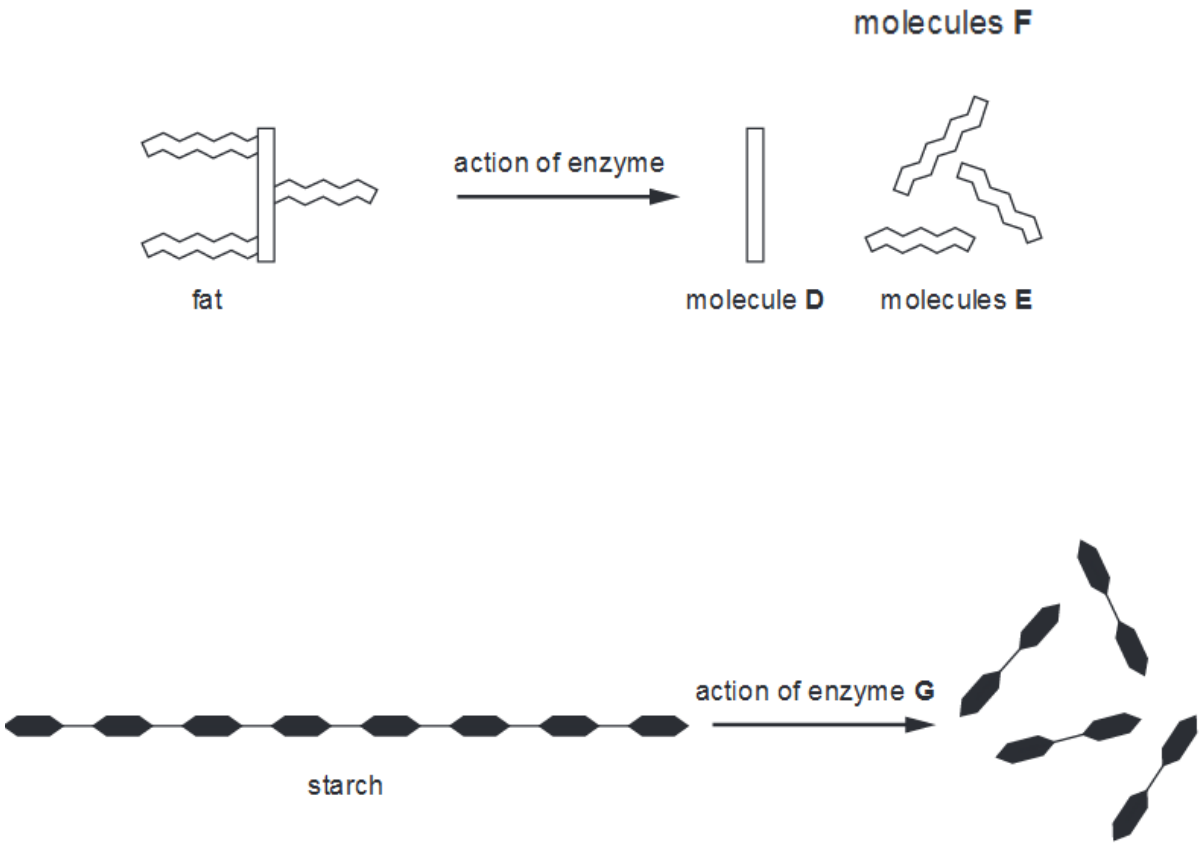


Figure 3

(a) Identify the molecules in figure 3.
D……..
E……..
F…….. [3]

(b) Identify enzyme G……. [1]

(c) Explain why enzyme G cannot digest fat molecules. [3]

(d) It has been found that fresh pineapple contains an enzyme that can be used to make meat more tender.
(i) Explain why the pineapple is placed on the meat a few hours before, rather than during, cooking. [3]

(ii) Suggest the name of the enzyme and how it tenderises the meat.
[3]

[Total:13]

4. Figure 4.1 shows an experiment where four bags made of partially permeable membrane are placed in tubes containing water. After 20 minutes, the water is tested for the presence of reducing sugars.

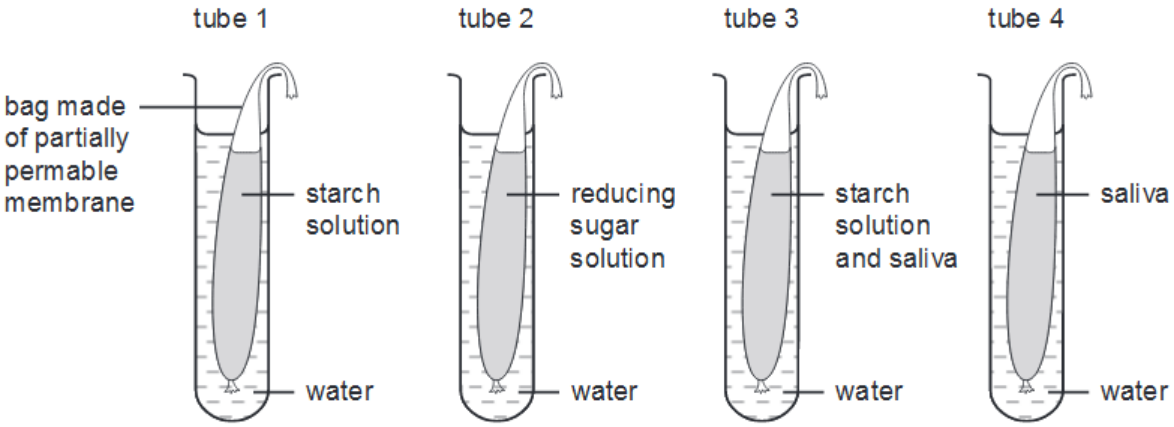


Figure 4.1

(a) Explain how the test for reducing sugar is performed.

[2]

(b) In which tubes would you expect a positive result? Explain your answer.

[5]

The figure 4.2 below show the human alimentary canal.

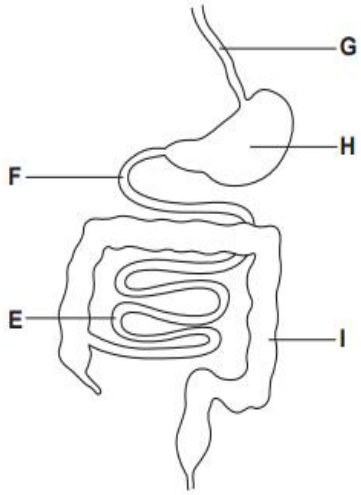


Figure 4.2

(c) Name parts G,H, I

G…….

H…….

I……

[3]

(d) In which lettered part does most of the absorption of substances in solution occur?

[1]

(e) In which lettered parts are proteins digested? [2]

[Total:13

Section B- Essay-type questions

5 (a) List the components of a balanced diet. State **one** use of each component. [6]

(b) Explain how this diet should be modified for each of the following people:
(i) an obese person [2]
(ii) a person with a history of heart problems. [2]

[Total:10]

6 (a) Describe each of the following processes:
(i) active transport [4]
(ii) osmosis [3]
(b) Explain what happens to a red blood cell when it is placed in pure water. [3]

[Total:10]