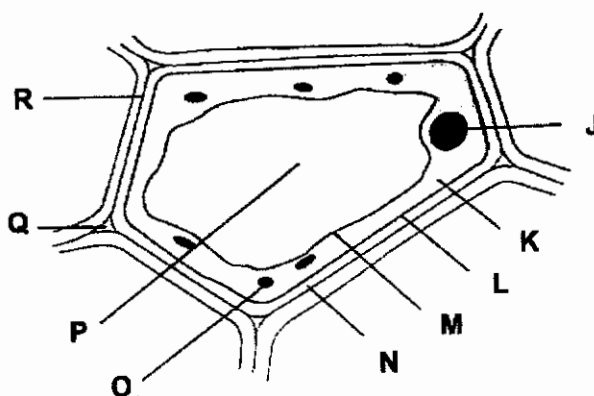


2

The diagram below shows a plant cell. Refer to the diagram for Questions 21 and 22.



21 What are the functions of parts J, K and L?

	J	K	L
A	controls cell activities	controls substances entering or leaving cell	serves as a medium for cellular activities to take place
B	controls cell activities	serves as a medium for cellular activities to take place	controls substances entering or leaving cell
C	controls substances entering or leaving cell	controls cell activities	serves as a medium for cellular activities to take place
D	serves as a medium for cellular activities to take place	controls cell activities	controls substances entering or leaving cell

22 Which parts are absent in a matured xylem cell?

- A J, K, L, M, N and O only
- B J, K, L, M, O and P only
- C J, K, M and P only
- D J, K, N and P only

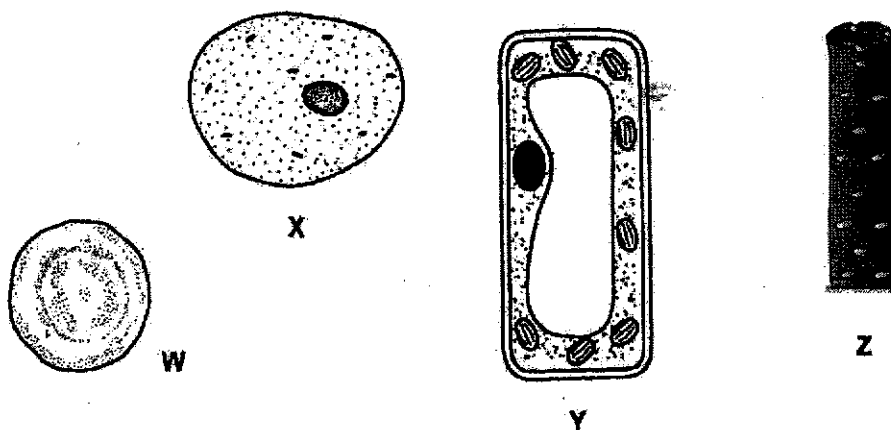
23 What are the levels of organisation of a villus and the small intestine?

	wall of villus	small intestine
A	cell	organ
B	cell	organ system
C	tissue	organ
D	tissue	organ system

- 24 Which process is **not** an example of diffusion?
- A Carbon dioxide enters the stomata of the leaves from the air.
 B Movement of chyme from stomach to small intestine.
 C Movement of glucose molecules from the small intestine into the bloodstream.
 D Movement of water and dissolved mineral salts from the soil to roots.
- 25 The colour of mixtures at the end of a Benedict's test can indicate the amount of reducing sugar present. Three samples, X containing 10% glucose, Y containing 5% sucrose and Z containing 1% glucose is tested. Which set of observations is correct?

	X	Y	Z
A	blue solution	green precipitate	brick-red precipitate
B	brick-red precipitate	green precipitate	blue solution
C	brick-red precipitate	blue solution	green precipitate
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- 26 The diagram below shows cells from four tissues.

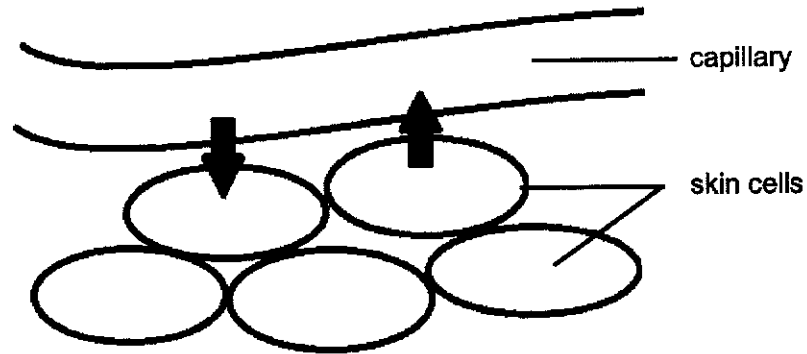


Which cells are adapted for transportation?

- A W and Y
 B W and Z
 C X and Y
 D X and Z
- 27 A disaccharide, P, is broken down into two different types of monosaccharides, Q and R, Which row correctly represents P, Q and R?

	P	Q	R
A	lactose	galactose	glucose
B	galactose	lactose	fructose
C	maltose	glucose	fructose
D	fructose	glucose	glucose

28 The diagram below shows substances being exchanged between the blood in a capillary and skin cells.

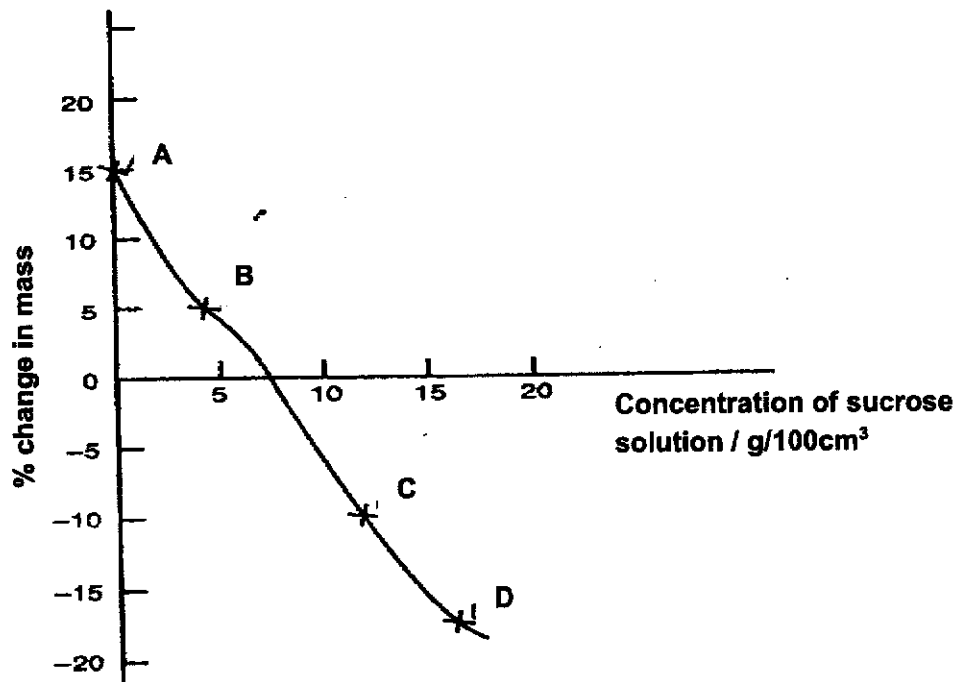


Identify the substances that enter and leave the skin cells via diffusion.

	enter the cell	leave the cell
A	carbon dioxide	oxygen
B	glucose	oxygen
C	glucose	carbon dioxide
D	oxygen	glucose

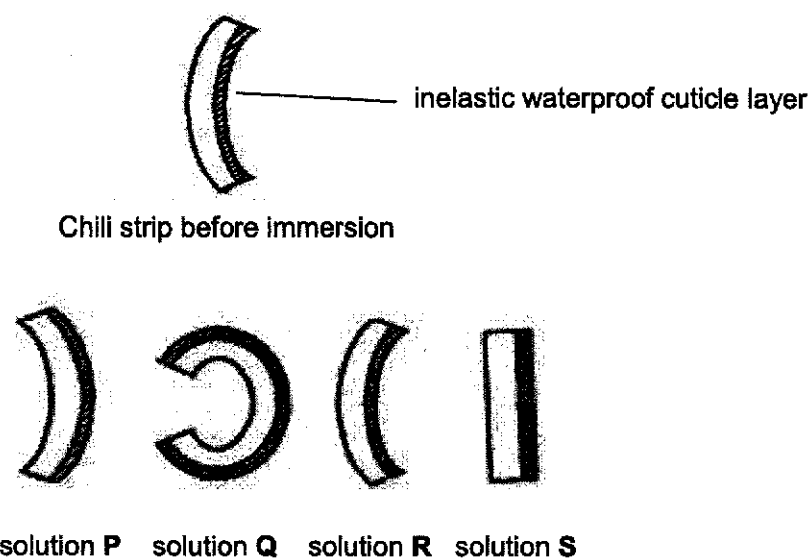
Refer to the graph given below to answer questions 29 and 30.

Four potato strips, **A**, **B**, **C** and **D** were cut from a fresh potato and immersed in sucrose solutions of different concentrations. The percentage change in mass were recorded and shown in the graph below.



- 29 The water potential of the cells in the potato strips are lower than the water potential of the sucrose solution in potato strip(s)
- A A only.
 B A and B only.
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 D B, C and D only.
- 30 From the graph, the concentration of the potato cell sap is found
- A at 0% change in mass
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- 31 A student carried out an experiment to find out the effect of salt concentration on chilli strips. Four sections of chilli strips of equal length were cut and placed in different solutions – P, Q, R and S. The cells on the outer surface of the chilli strip are protected by an inelastic waterproof cuticle layer (darker shade).

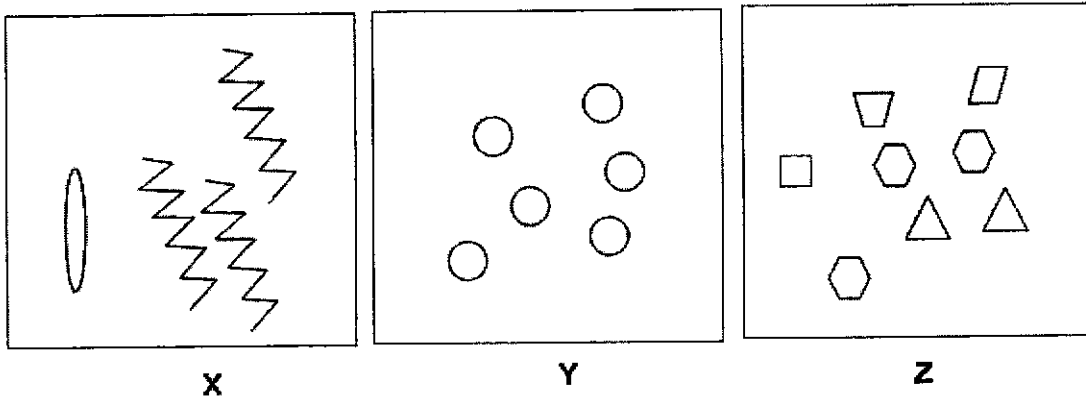
The figure below shows the appearance of the chilli strip before and after immersion in different solutions for 60 minutes.



Which row shows the sequence of solutions of decreasing concentrations?

	highest concentration	—————→	lowest concentration	
A	Q	R	P	S
B	R	P	Q	S
C	Q	P	S	R
D	P	S	R	Q

- 32 A severely overweight man needs to lose weight. What can this person do to achieve that goal without compromising on his health?
- A Eat only one large meal a day.
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 C Undergo a surgery to remove the gall bladder.
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- 33 The diagram below shows the basic units of three complex macromolecules.



Which row correctly names the complex macromolecules of X, Y and Z?

	X	Y	Z
A	glycogen	pepsin	oil
B	pepsin	glycogen	oil
C	oil	pepsin	glycogen
D	oil	glycogen	pepsin

- 34 The table below shows the chemical elements present in each of the four substances. Which substance, A, B, C or D could be a protein?

Legend:

✓ = present x = absent

	carbon	hydrogen	nitrogen	oxygen
A	✓	✓	✓	x
B	✓	✓	x	✓
C	✓	✓	✓	✓
D	✓	x	✓	✓

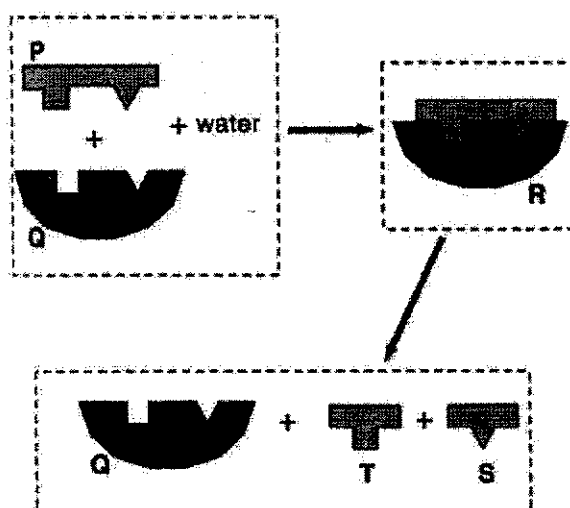
- 35 Which row describes the digestive processes in the mouth?

	chemical digestion	physical digestion
A	✓	✓
B	✓	x
C	x	✓
D	x	x

Legend:

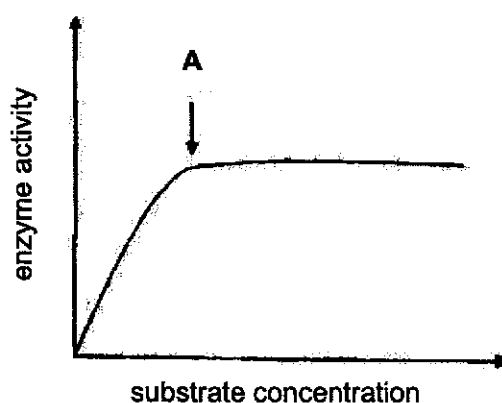
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Which reaction can be represented by the above diagram?

- A condensation reaction to form maltose
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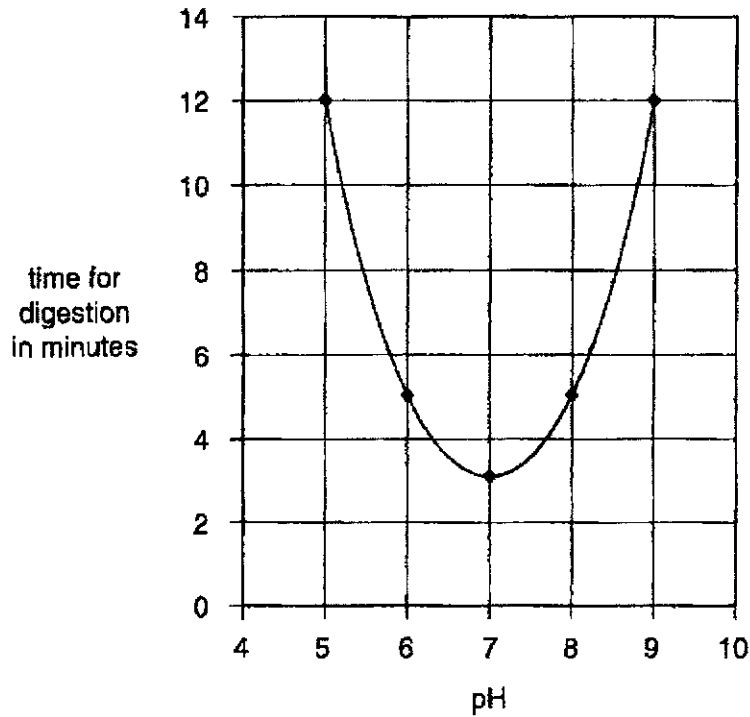


Which statement is an accurate interpretation of the graph?

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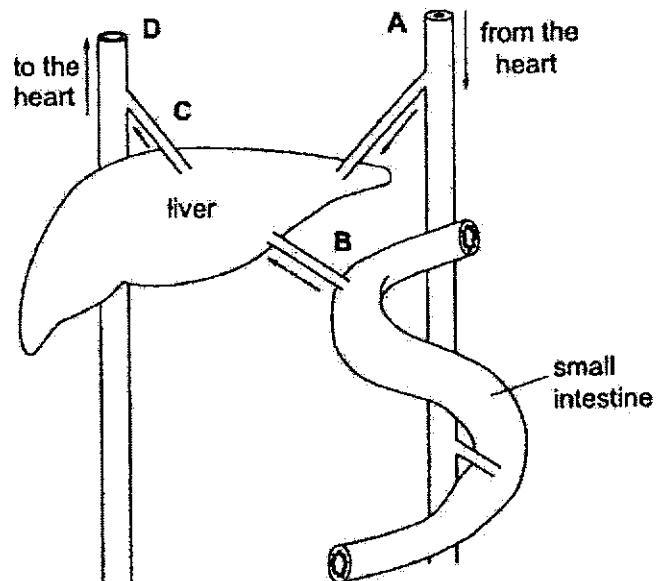
8

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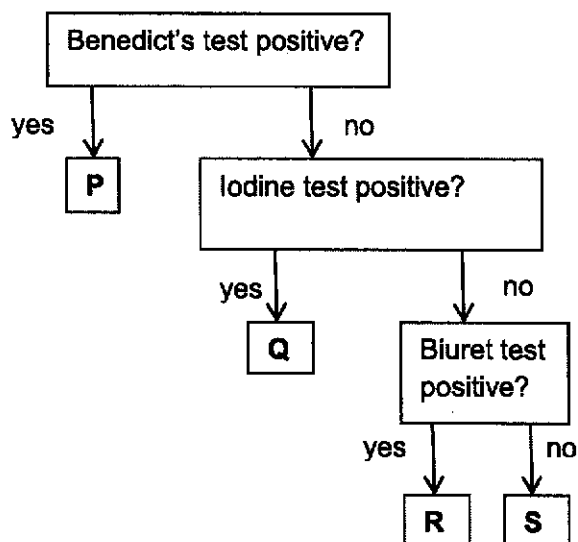


In which part of the digestive system will this enzyme be found?

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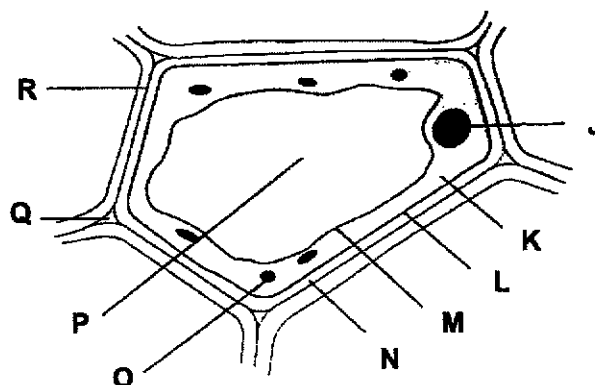


Based on the results, identify P, Q, R and S.

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End of Paper 1

The diagram below shows a plant cell. Refer to the diagram for Questions 21 and 22.



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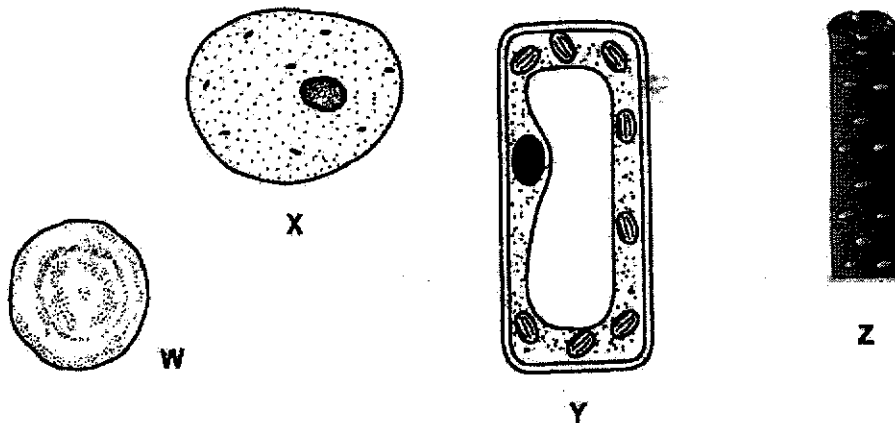
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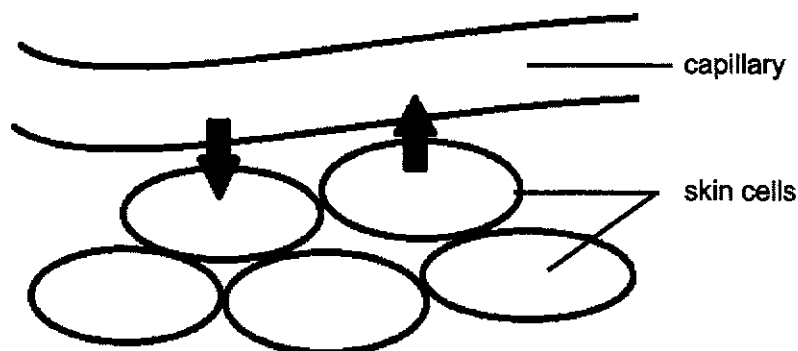
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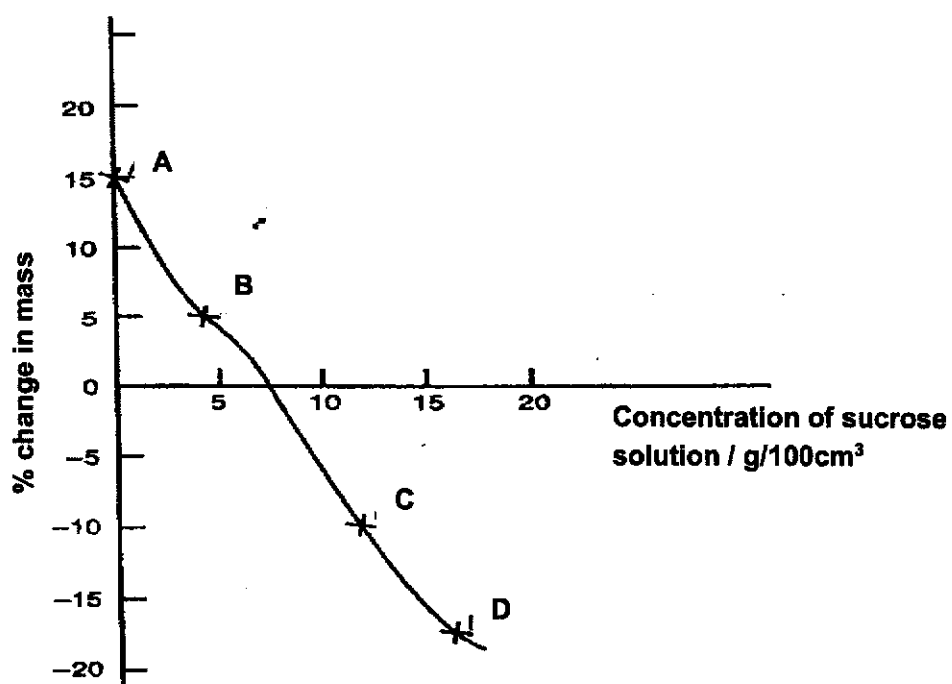


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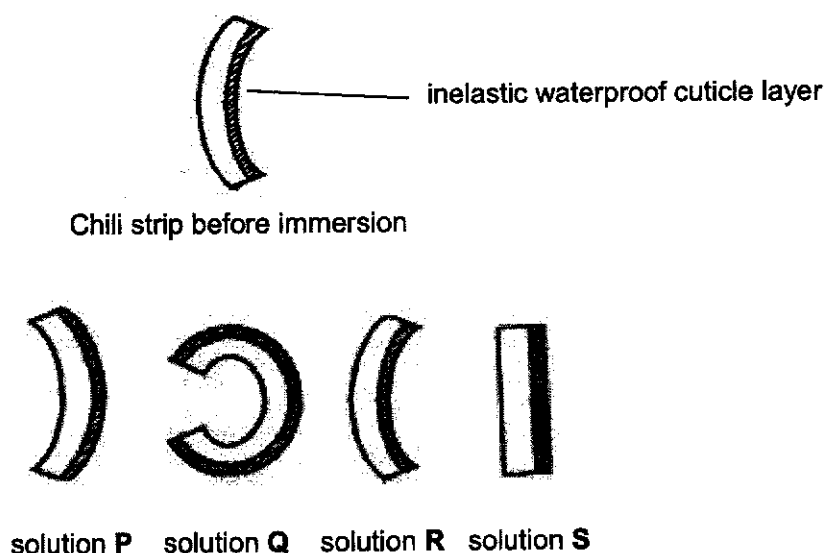
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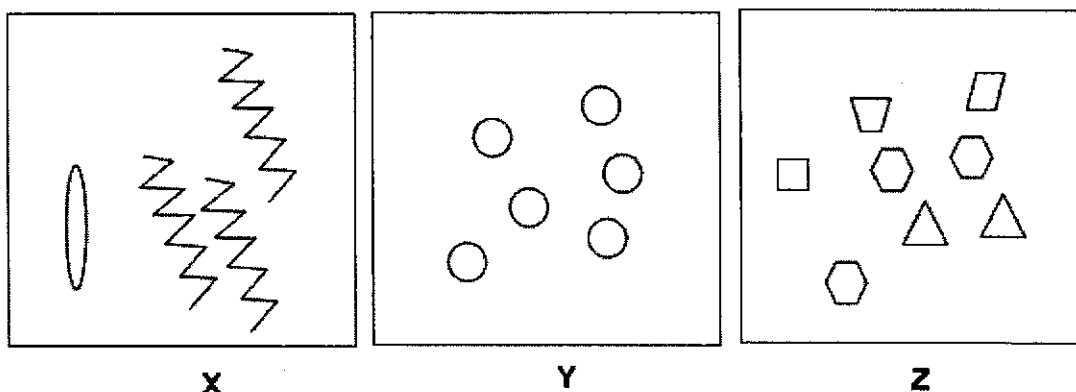


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6

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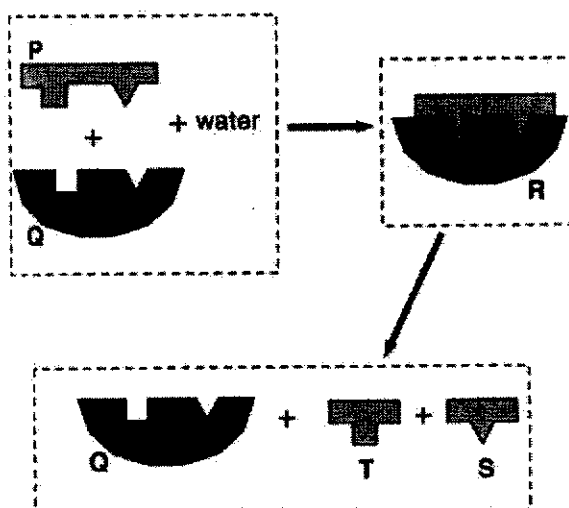
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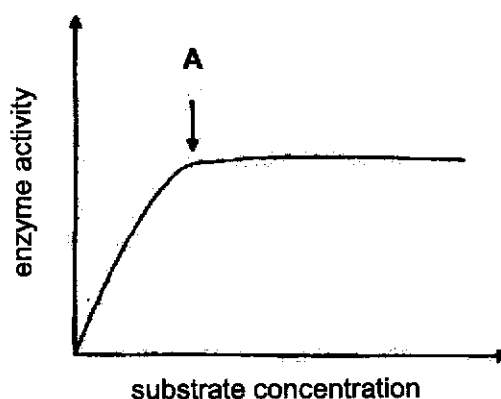
7

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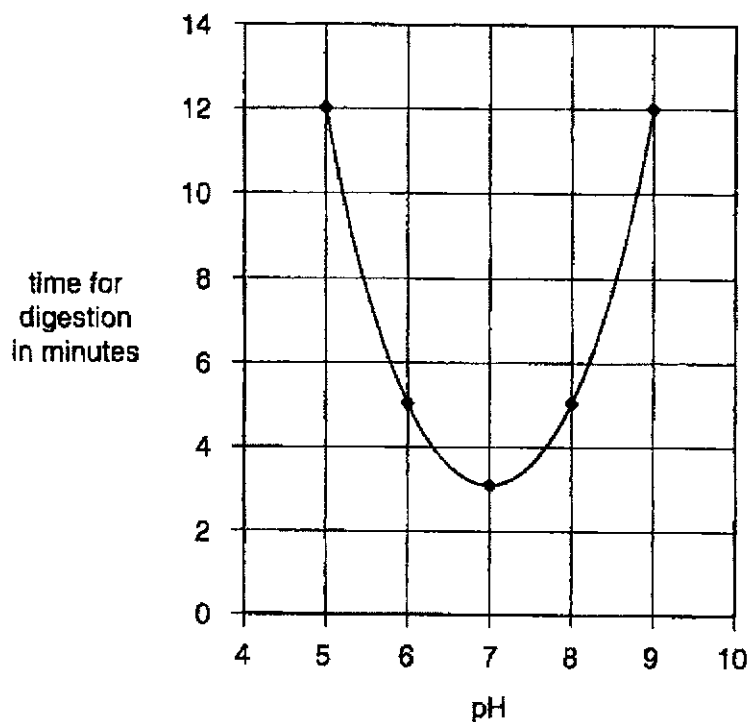
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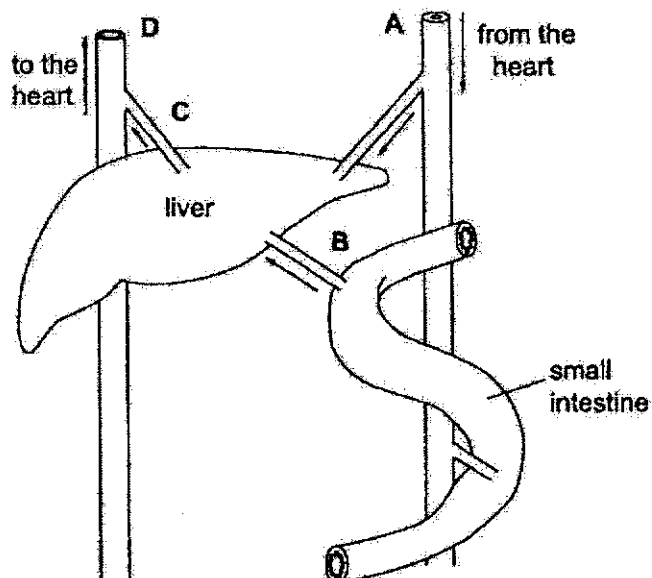
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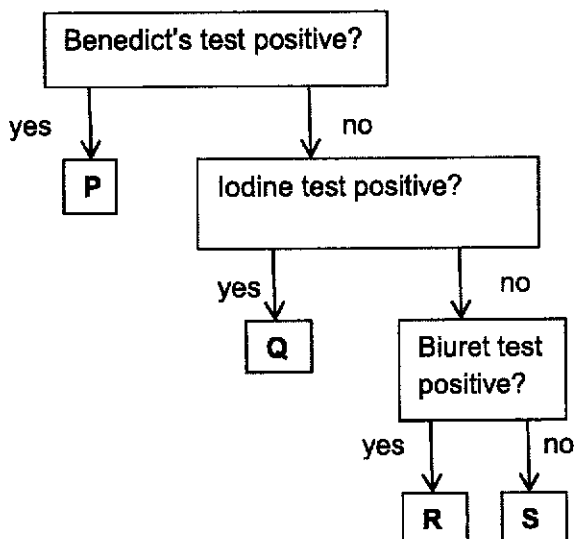


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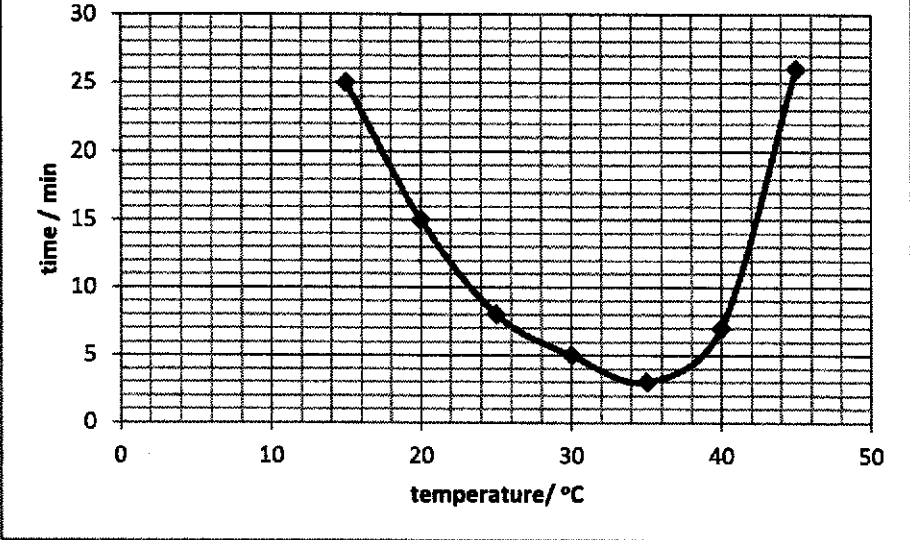
End of Paper 1

Paper 1 (20 marks)

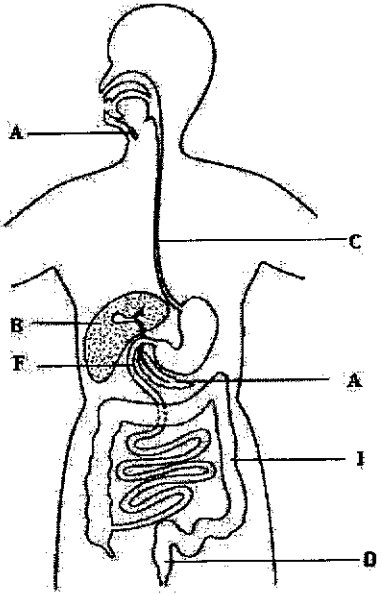
21	22	23	24	25	26	27	28	29	30
B	B	C	B	C	B	A	C	B	A
31	32	33	34	35	36	37	38	39	40
C	B	D	C	A	D	B	B	B	A

Question		Answer	Marks	Total															
A1	a)	Any 2 of the following: <ul style="list-style-type: none"> • Presence of <u>cell wall</u> • Presence of <u>chloroplast</u> • Presence of <u>large central vacuole</u> 	1	5															
	b)	Structure A is the chloroplast. It <u>contains chlorophyll</u> that <u>traps sunlight for photosynthesis</u> . <i>R: It traps sunlight</i>	1 1																
	c)	Unlike an animal cell, the root hair cell has a <u>long and narrow protrusion</u>	1																
	cii)	Any 1 of the following: Unlike an animal cell, the xylem <ul style="list-style-type: none"> • does not have any protoplasm. • does not have cell organelles and cytoplasm. • only contains a cell wall. • contains lignin. 	1																
A2	a)	<table border="1"> <thead> <tr> <th>strip</th> <th>length of strips in water (mm)</th> <th>length of strips in 20% sugar solution (mm)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>54</td> <td>46</td> </tr> <tr> <td>2</td> <td>53</td> <td>43</td> </tr> <tr> <td>3</td> <td>55</td> <td>43</td> </tr> <tr> <td>average length</td> <td>54</td> <td>44</td> </tr> </tbody> </table>	strip	length of strips in water (mm)	length of strips in 20% sugar solution (mm)	1	54	46	2	53	43	3	55	43	average length	54	44	1	10
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		2	53	43															
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b)	Water has a higher water potential than the cell sap of the potato cells. Hence, water moves into the potato cells <u>by osmosis</u> , resulting in an <u>increase in the length</u> of potato strip. <i>R: water has higher water potential than the potato strip</i>	1 1 1																	
bii)	Sugar solution has a lower water potential than the cell sap of the potato cells. Hence, water moves out of the potato cells into the sugar solution <u>by osmosis</u> , resulting in a <u>decrease in the length</u> of potato strip.	1 1 1																	

[Turn Over]

	c)	The <u>net movement of water molecules</u> from a solution of <u>higher water potential</u> to a solution of <u>lower water potential</u> across a <u>partially permeable membrane</u>	1 1 1	
A3	a)	 <p>axes with labels plots smooth curve with no extrapolation</p>	1 1 1	10
	b)	35 – 37°C	1	
	c)	This is to ensure that both amylase and starch are at the desired temperature before the reaction takes place so that the <u>results are accurate and reliable</u> .	1	
	d)	From the graph, between 40 – 45°C, as <u>temperature increased the time taken for the digestion of fats increases</u> . This is because <u>beyond the optimum temperature, the amylase denatures</u> and the rate of <u>amylase activity decreases</u> too.	1 1	
	e)	Add equal volume of Benedict's solution to 2 cm ³ of the sample solution. Place the test tubes in boiling water for 2-3 minutes. A brick red precipitate will form (as maltose is a reducing sugar).	1 1 1	
A4	a)	Tube B. It contains <u>hydrochloric acid</u> which provides the <u>optimum acidic pH</u> for the enzyme to act.	1 1	5
	b)	Pepsin	1	
	c)	It would provide the <u>optimum temperature for the enzyme to work</u> and this would make the enzymes work at a faster rate.	1	
	d)	Do not use with hot water/ boiling water/ water above 40 °C ; Do not use with bleach (very alkaline) ;	1	
A5	a)	K: ileum L: large intestine/colon	1 1	5

[Turn Over]

	b)	There is no digestion of starch between M and N . pH in the stomach is too acidic and would denature amylase.	1 1	
	c)	<u>Digestion is completed</u> in K . Hence, there are no more nutrients to be digested in L . R: digestion stops at ileum/ only water is absorbed in L	1	
A6	a)	C: oesophagus D: rectum	1 1	10
	b)		4	
		<u>Presence of lipase released from pancreas / walls of the small intestine / in intestinal juice</u> <u>Digest fats into fatty acids and glycerol</u> <u>bile (salts) released from gall bladder emulsifies fat into tiny oil droplets</u> <u>to increase surface area to volume ratio for faster digestion by lipase</u>	1 1 1 1	
B7	a)	Enzymes are <u>biological catalyst</u> made up of proteins. They <u>speed up the rate of chemical reactions</u> <u>without being chemically unchanged</u> at the end of the reaction.	1 1 1	10
	b)	A: Substrate B: Enzyme C: Enzyme-substrate complex D: products	2	
	c)	<u>The enzyme is the lock</u> and the <u>substrate is the key</u> . <u>An enzyme has a specific 3-D shape, which contains an active site.</u> <u>Only a substrate with a 3-D shape complementary to that of the active site and can fit into the enzyme to form an enzyme-substrate complex.</u> <u>Chemical reactions will then occur and the substrate will then be converted into products.</u> <u>The products then detach from the active site. The enzyme remains unchanged at the end of the reaction.</u>	1 1 1 1 1	

[Turn Over]

B8	a)	Any two of the following: Produce <u>pancreatic amylase to digest starch into maltose.</u> Produce <u>lipase to digest fats to fatty acids and glycerol.</u> Produce <u>protease to digest protein into polypeptides then amino acids.</u>	2	10
	b)	Regulate blood glucose concentration by <u>converting excess glucose into glycogen for storage and converts glycogen into glucose for usage.</u> <u>Deamination of excess amino acids to form urea.</u>	1 1	
	c)	Production of bile Detoxification/breakdown of alcohol	1 1	
	d)	Any two of the following: • The small intestine is <u>long</u> to provide <u>sufficient time for absorption.</u> • The <u>inner surface of the small intestine is folded and have finger-like projection called villi</u> to <u>increase surface area to volume ratio for faster rate of absorption of nutrients.</u> • The <u>epithelial cells of the villi have microvilli</u> to <u>increase surface area to volume ratio for faster rate of absorption of nutrients .</u>	1 1 1 1	

[Turn Over]

