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BIOLOGY-0610/31, 32, 33 TOPIC-CHEMICALS OF CELL

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1 Fig. 1.1 shows an animal cell.

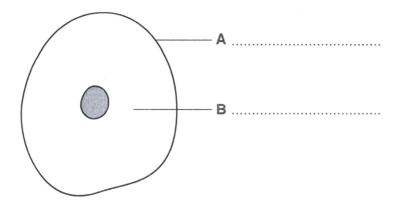


Fig. 1.1

(a)	(i)	Name the features labelled A and B .	
		Write your answers on Fig. 1.1.	[2]
	(ii)	The nucleus of living cells contains genetic material.	
		Name the chemical that this genetic material is made from.	[1]
(b)	The	cell in Fig. 1.1 carries out aerobic respiration.	
		ne one chemical that diffuses into an animal cell and one chemical that diffuses out o during aerobic respiration.	fa
	che	mical that diffuses in	
	che	mical that diffuses out	
		,	[2]
(c)	The	process of active transport occurs in some cells.	
	Outl	line one way in which diffusion is different to active transport.	
			F 4 7

Fig. 1.2 shows a cell from the palisade mesophyll layer of a leaf.

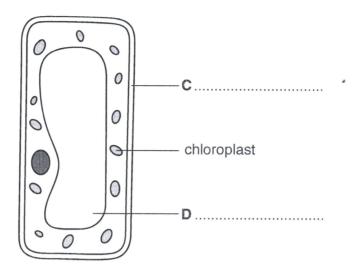


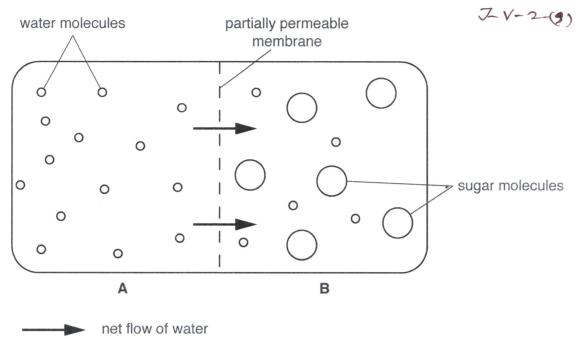
Fig. 1.2

a) (I)	Name the features lab	elled C and D.	
	Write your answers or	Fig. 1.2.	[2]
(ii)	Name the process car on this process.	ried out by the chloroplasts an	d explain why all animal life depends
	explanation		
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[Total: 13]

[5]

(a) Fig. 9.1 represents two liquids, A and B, separated by a partially permeable membrane.



A is pure water and B is a sugar solution.

In the human alimentary canal, water moves from the colon into the blood.

Use the information in Fig. 9.1 to explain the movement of water from the colon into the blood.

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Sensitional declaration of the colon into the blood.

(b) The ratio of the surface area to the volume of a cell affects the rate of diffusion of a substance into the cell.

The results of an investigation on diffusion into a cube-shaped cell are shown in Table 9.1.

(i) Complete Table 9.1. One of the rows has been done for you.

Table 9.1

length of side of cube /mm	time taken for substance to diffuse to centre of cell /s	surface area of cube /mm ² (total of 6 sides)	volume of cube /mm ³	surface area to volume ratio
1	20	6	1	6:1
2	41			
3	76			

	(ii)	Suggest how surface area to volume ratio affects the efficiency of diffusion.
		A REARRANGED &
(c)		lain one way that the lungs of a mammal are adapted to increase the rate of diffusion of gen from the alveoli to the blood. Mob: +974 55373670 / 55258711 E-mail:rashed.saba@gmail.com
		[2]

[Total: 8]

[2]

For Examiner's Use

3	(a)	Define diffusion.
		, roi
		[2]
	(b)	Fig. 3.1 shows an apparatus that was used to investigate the effect of concentration of a chemical on the rate of diffusion.
		cotton wool soaked in ethanoic acid cork
		pieces of damp blue litmus
		paper at 2 cm intervals RRANGED
		Fig. 3.4
		As ethanoic acid diffused along the tube, the pieces of blue litmus paper turned red.
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For Examiner's Use

Two different samples of ethanoic acid, $\bf A$ and $\bf B$, were used in this apparatus. The two samples had different concentrations. The results are shown in Fig. 3.2.

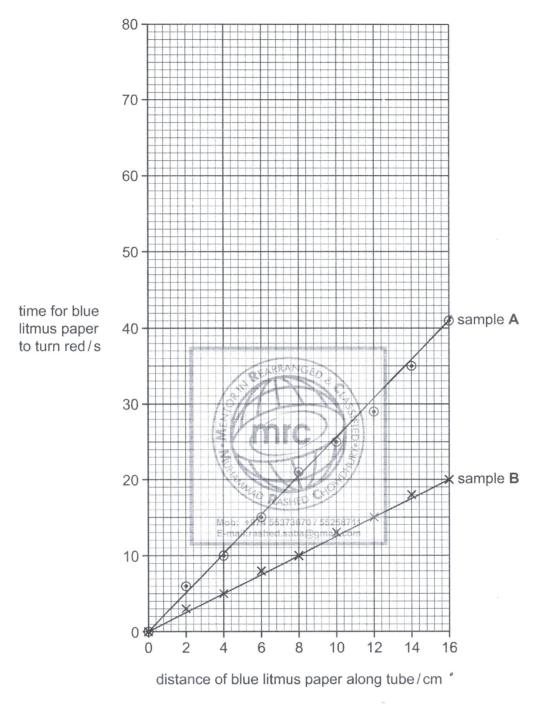


Fig. 3.2

Table 3.1 shows the results for a third sample, **C**, of ethanoic acid.

Table 3.1

distance of blue litmus paper along tube / cm	time for blue litmus paper to turn red / s
2	9
4	18
6	28
8	35
10	45
12	55
14	63
16	72

	(i)	Complete Fig. 3.2 by plotting the results shown in Table 3.1.	
		Plot the results shown in Table 3.1 on the grid, Fig. 3.2, on page 6.	[3]
	(ii)	State which sample of ethanoic acid, A, B or C, took the longest time to tra 8 cm along the tube.	
			[1]
((iii)	State and explain which sample of ethanoic acid was the most concentrated.	
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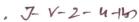
			[2]
			[4]
(c)	Sub	ostances can enter and leave cells by either diffusion or by osmosis.	
	Sta	te two ways in which osmosis differs from diffusion.	
	1	,	

	2		*****
			[2]

[Total: 10]

(c)	Mat	Materials can enter the cells shown in Fig. 4.1 by diffusion and osmosis.	
	(i)	Define diffusion.	
		[2]	
	(ii)	Describe how osmosis differs from diffusion.	
		,	
		[2]	
		[Total : 11]	





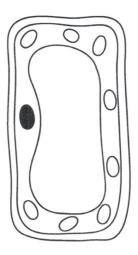


Fig. 4.2

The cell in Fig. 4.2 contains structures which are **not** present in root hair cells.

ction.	ructures and explain their fund	State the name of these st
	QEARRANGES .	
	S FILES	
	E mrc	
[3]	RASHED GO	
[Total: 10]	Mub: +919 93373670 (35238711 E-mail:rashed.saba@gmail.com	

- 5 This question is about the movement of substances into and out of cells.
 - (a) Draw one straight line from each box on the left to join it with the box containing the correct description on the right.

how substances pass into and out of cells

description

the movement of water through a partially permeable membrane

active transport

the exchange of one kind of particle for another through a partially permeable membrane

diffusion

the net movement of particles from a region of their higher concentration to a region of their lower concentration down a concentration gradient

osmosis

JARRANGA

the movement of particles through a cell membrane from a region of lower concentration to a region of higher concentration using energy

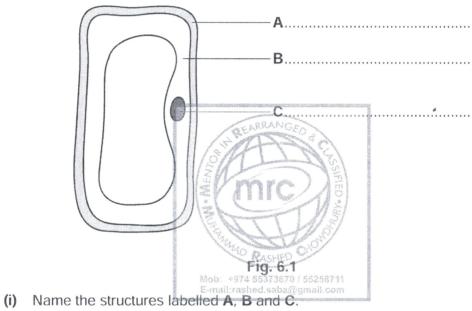
[3]

(b) (i)	The contents of a meal must be digested before they can be absorbed.
	State the two types of digestion.
	1
	2[1]
(ii)	The body uses enzymes to digest food.
	Define the term <i>enzyme</i> .
	[2]
(iii)	Give one example of a digestive enzyme and the substrate it acts on.
	enzymesubstrate
(iv)	Suggest why the human digestive system must make many different enzymes.
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	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	[2]
	, [Total: 9]

(a) Describe osmosis.

 [31
[0]

(b) Fig. 6.1 shows a plant cell.



Write your answers on Fig. 6.1.

[3]

(ii) On Fig 6.1, draw a label line **D** to show the position of the vacuole.

[1]

(c) Fig. 6.2 shows the same cell in pure water. It is left there for 30 minutes.

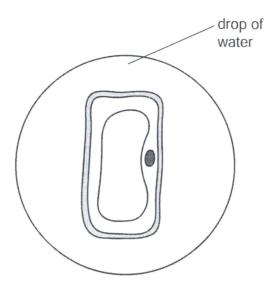


Fig. 6.2

Describe the changes that will occur in the cell during the 30 minutes it is in pure water.
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[3]

0 7a)	Pro	Proteins are digested in the stomach and small intestine.		
	(i)) Which type of enzyme breaks down proteins?		
		[1]		
	(ii)	State how the conditions necessary for the digestion of proteins in the stomach are different from those in the small intestine.		
		[1]		
(b)	(b) When carbohydrates have been digested, excess glucose is stored.			
	(i)	Where is it stored?		
		[1]		
	(ii)	What is it stored as?		
		[1]		
(c)	Exc	ess amino acids cannot be stored ARRANGED		
(0)				
	Describe how they are removed from the body.			
		(E) (F) (F) (F) (F) (F) (F) (F) (F) (F) (F		
		PACHED GO		
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		[4]		
		[Total:8]		

8 (a) Define diffusion. (b) Fig. 8.1 shows an apparatus that was set up to investigate diffusion. cork cotton wool cork soaked in ammonium hydroxide pieces of damp red litmus paper at 2 cm intervals Question 8 continues on page 14. Mob: +974 55373670 / 55258711 E-mail:rashed.saba@gmail.com

Fig. 8.2 shows the results for two samples of ammonium hydroxide that were investigated.

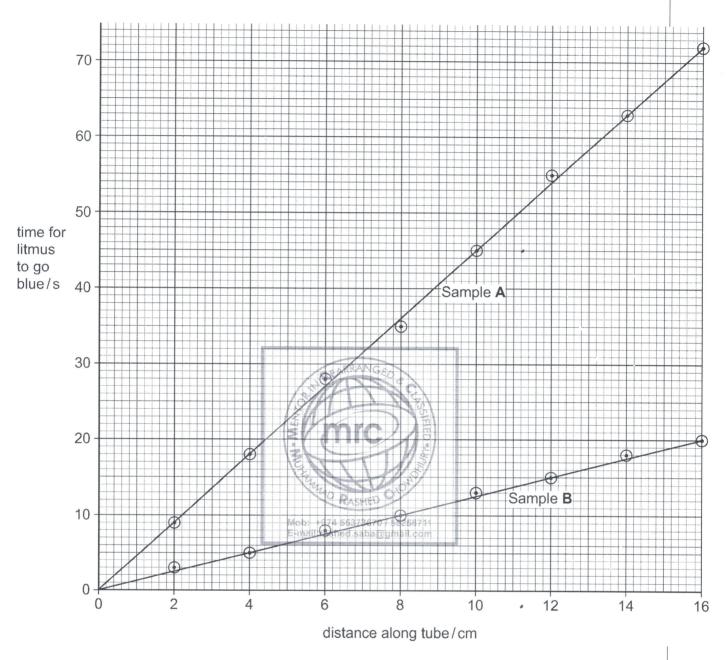


Fig. 8.2

Table 8.1 gives data for a third sample, ${\bf C}$, of ammonium hydroxide that was investigated.

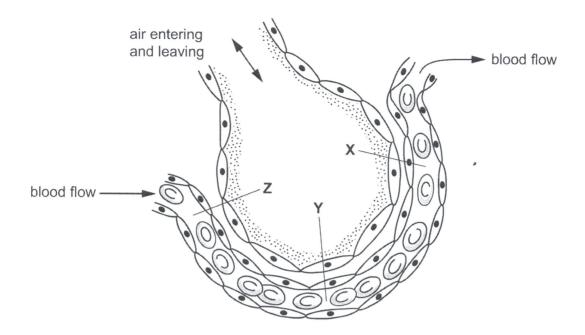
Table 8.1

distance of red litmus paper along tube / cm	time for red litmus paper to go blue/s
2	6
4	10
6	15
8	21
10	25
12	29
14	35
16	41

(i)	Plot the data in Table	8.1 on Fig. 8.2.	, [3]
(ii)	Suggest what has cau	sed the litmus paper to go blu	e.
			[1]
(iii)	State which sample of tube.	ammonium hydroxide took lo	ngest to travel 10 cm along the
		Mob: +974 55373670 / 55258711 E-mail:rashed.saba@gmail.com	[1]
(iv)	What can you suggest	about the concentration of sa	ample C ? Explain your answer.
			[2]

[Total: 12]

(c) Fig. 8.3 shows an alveolus and an associated blood capillary.



(i) Suggest at which point, X, Y or Z, the rate of diffusion of carbon dioxide will be highest.

[1]

(ii) The bronchi and bronchioles are lined with ciliated epithelium tissue and a thin layer of mucus. Describe the role of the cilia and mucus.

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[2]

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9	(a)	(i)	Define osmosis.		1
•	(u)	(')	Define osmosis.		For Examiner's
					Use
				[3]	
		(ii)	Osmosis is considered by many scientists to be a form of diffusion.		
			Suggest two ways in which diffusion is different from osmosis.		
			1.		
			2.		
				[2]	
	(b)	(i)	Explain how root hair cells use osmosis to take up water.		
			E LANGE CLOTH		
			Mob: +974 55373670 / 55258711 E-mail:rashed.saba@gmail.com	[2]	
		(ii)	The land on which a cereal crop is growing is flooded by sea water.		
			Suggest the effect sea water could have on the cereal plants.		
				[4]	
			[Total:	11]	

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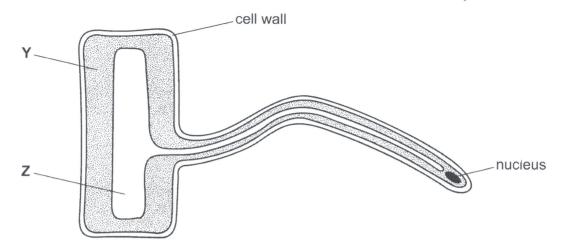


Fig. 9.1

(i)	Name the following parts of the cell.		
	Υ		
(ii)	Z The function of this cell is to absorb water and mineral ions from the soil.		
,	Describe one feature shown in the diagram, that is an adaptation for this function.		
	Mob: +974 55373670 / 55258711 [1]		
(iii)	State two features of this plant cell that would not be present in a typical animal cell, such as a liver cell.		
	1		
	2		
	[2]		
(b) (i)	State what is meant by the term osmosis.		
	[3]		

For Examiner's Use

pro	There are many people in the world who are not able to digest lactose, a sugar in milk produced by cows, goats and sheep. These people do not make the enzyme lactase that preaks down lactose in the small intestine.			
(a)) Describe what is meant by the	e term <i>enzyme</i> .		
			[2]	
(b)	b) People who cannot digest lactose sometimes drink a liquid containing the enzyme lactase before they eat food containing milk products. The aim of this treatment is to digest any lactose in the food, but it is not likely to be successful.			
	Suggest why this treatment is	not likely to be successful.		
		BEARRANGED ES		
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			[Total: 5]	

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