MODUL EMaS JPNTrg

MODULE 1
BIOLOGY FORM 4

CHAPTER 1. Cell structure & Cell organisation

CHAPTER 2. Movement of substances across the plasma membrane

Module Panels:
1. **Tn. Haji Meli bin Hussin**
   SM Sains K. Terengganu
2. **En. Mohd Nor bin Ismail**
   SMK Tun Telanai, Marang
3. **En. Zulkifli bin Awang**
   SMK Ibrahim Fikri, K. Terengganu
4. **Pn.Hjh Muslimah Bt Mahmood**
   SM Sains Sultan Mahmud , K. Terengganu
5. **Pn. Hjh Rohayah Bt Md Nor**
   SMK Sultan Mansor, K. Terengganu

For Question 1 to 20, each question is followed by four alternative answers **A, B, C or D.** Choose **one** correct answer for each question and circle the corresponding space in your question paper.

Section A

1.

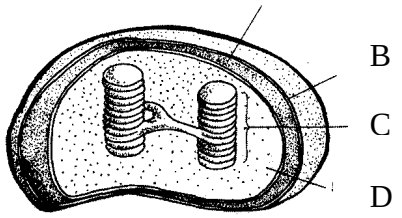


Figure 1: Chloroplast Organelle

Which part of the organelle contains the chlorophyll?.

2. Figure 2 shows the structure of an animal cell.

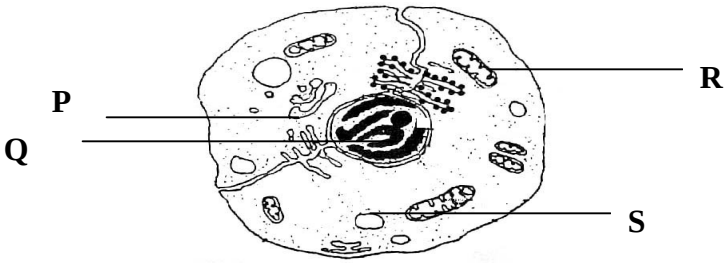


Figure 2: animal cell

Choose the correct matching.

	Organelle	**Function**
A	P	Modify and alter protein
B	Q	Site of cellular respiration.
C	R	Transport proteins to other part of the cell.
D	S	Synthesis of protein.

3. The diagram shows an aquatic organism.

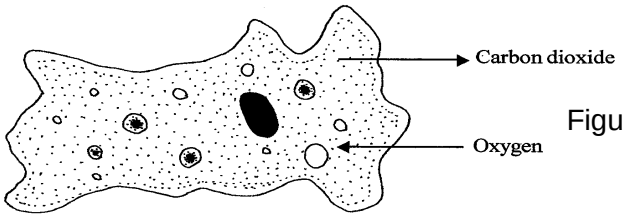


Figure 3

What is the process of substances moving in and out as shown by the organism?

A. Osmosis
B. Diffusion
C. Facilitated diffusion
D. Active transport.

4. Cucumber slices are immersed in 0.1% sucrose solution. After 3 hours, the slices are found to be turgid and hard.

Which of the following statements explain this phenomenon?

A. The cucumber cell wall prevents it from shrinking.
B. The cell sap is hypotonic towards the sucrose solution
C. The high concentration of the cell sap in the vacuole causes water to diffuse in.
D. The cucumber cell wall allows the sucrose molecules to diffuse into the cell .

5. Which of the following are animal tissues?

I. Muscle tissue
II. Epithelial tissue
III. Epidermal tissue
IV. Connective tissue

A. I and II only
B. I, II and III only
C. I, II and IV only
D. II, III and IV only.

6. The figure shows the structure of a plant cell.

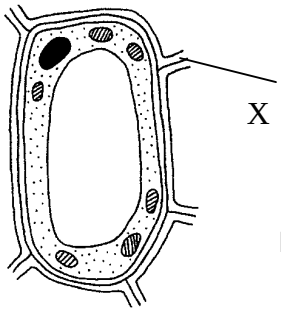
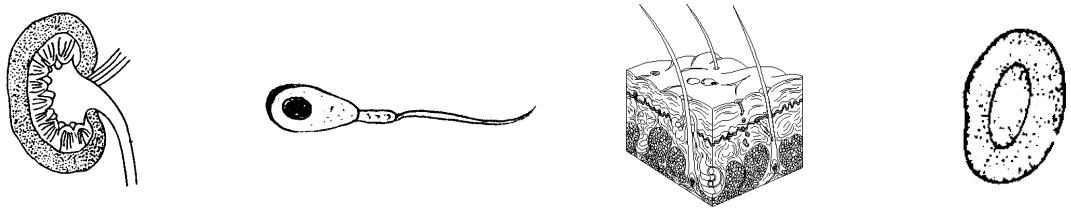


Figure 4

Which one of the following is true about X?

A. Semipermeable
B. Elastic
C. Fully permeable
D. Rigid

7. The figure shows different human cells and organs.



P O R S

Figure 5

Which systems do these cells and organs belong to?

	P	Q	R	S
A	Endocrine system	Respiratory system	Digestive system	Integumentary system
B	Excretory system	Reproductive system	Integumentary system	Circulatory system
C	Digestive system	Endocrine system	Nervous system	Respiratory system
D	Integumentary system	Reproductive system	Muscular system	Circulatory system

8. What are the phenomena taking place for the following cell?

P Q R

Figure 6

	P	Q	R
A	Haemolysis	Plasmolysis	Crenation
B	Plasmolysis	Crenation	Deplasmolysis
C	Deplasmolysis	Plasmolysis	Crenation
D	Crenation	Haemolysis	Plasmolysis

9. The diagram shows a plant cell which has been placed in a sucrose solution for 10 minutes.

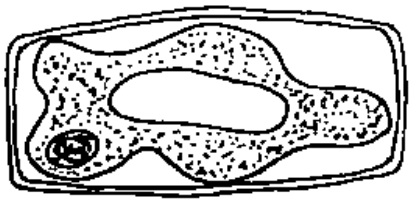
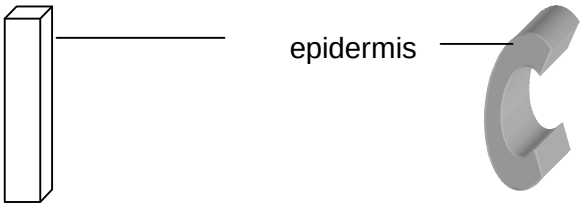


Figure 7

Which statement about the cell is correct?
I. The cell is flaccid
II. The plasma membrane is broken.
III. The cell will become turgid again if placed in distilled water.
IV. Water has moved into the cell by osmosis.

A. I and III only
B. I and II only.
C. II and IV only
D. I, II and IV only.

10.



Before Experiment After experiment

Figure 8

The above figure shows a plant section before and after being immersed in a solution for 20 minutes . What can be concluded about the plant section?.

A. Cell sap of the plant is isotonic.
B. Osmotic pressure of the plant cell is low.
C. Cells of the plant are turgid
D. Cell sap of the plant loses water.

11. Which of the following factors affect the internal environment?

I	Osmotic pressure
II	Glucose level
III	pH
IV	Temperature

A. II and III only
B. I, II and IV only
C. I, II and IV only
D. I, II, III and IV

12. The diagram below shows a diffusion process through a partially permeable membrane.

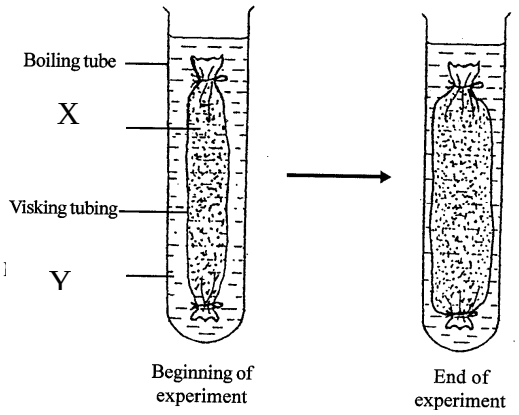


Figure 9

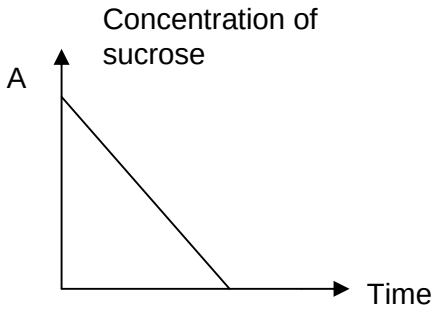
What are X and Y solution?

	X	Y
A	20% Sucrose solution	Distilled water
B	Distilled water	Distilled water
C	20% Sucrose solution	20% Sucrose solution
D	Distilled water	20% Sucrose solution

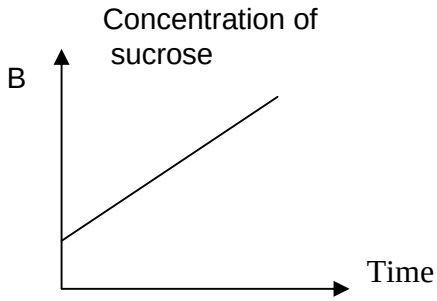
13. The diagram in question 11 shows an experiment to investigate the changes of sucrose concentration in a visking tubing.

Which of the following graphs A,B, C or D represents the change

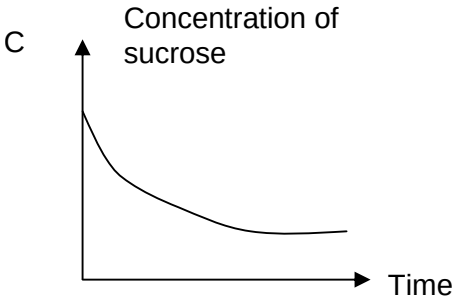
A



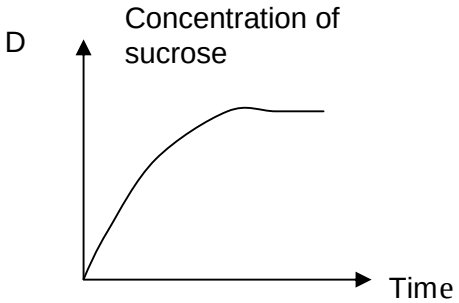
B



C



D



14. Diagram below shows an experiment to investigate the movement of substances through a visking tube.

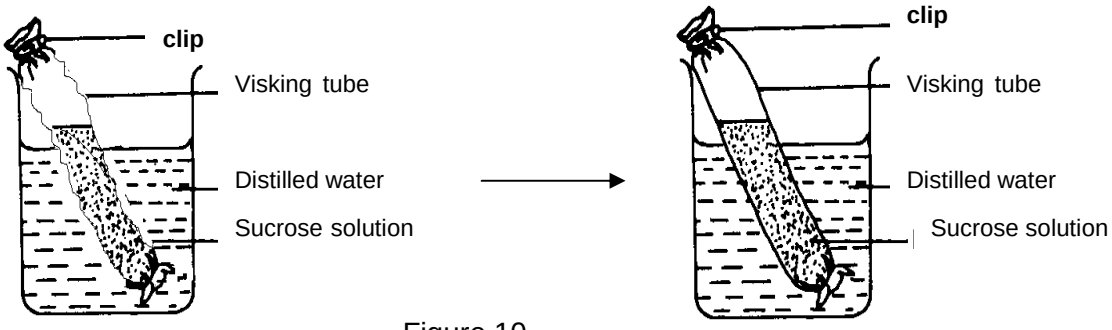
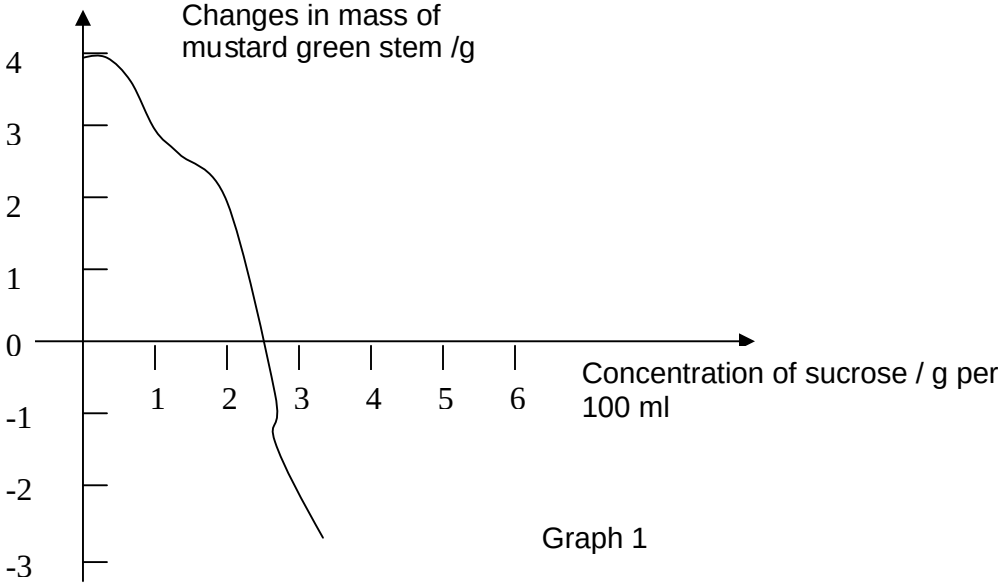


Figure 10

What is the process that takes place in the above diagram?

A. Osmosis
B. Active transport
C. Facilitated diffusion
D. Facilitated transportation

15. The graph shows the changes in mass of mustard green stem immersed in different concentration of sucrose solution.



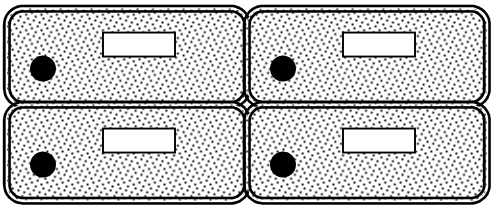
Graph 1

Based on the above graph, which of the following concentration of sucrose solution should be used so that a flaccid potato strip regains its turgidity?

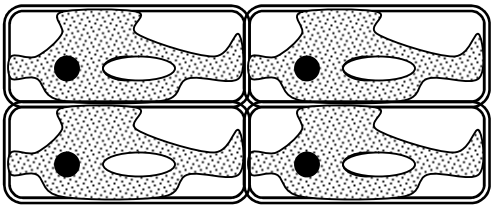
A. 1.5 g per 100 ml
B. 2.5 g per 100 ml
C. 3.5 g per 100 ml
D. 4.5 g per 100 ml

16. Which of the following onion cells were immersed in a hypotonic solutions?

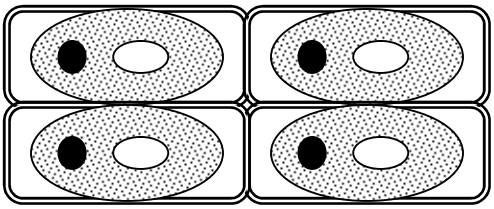
A.



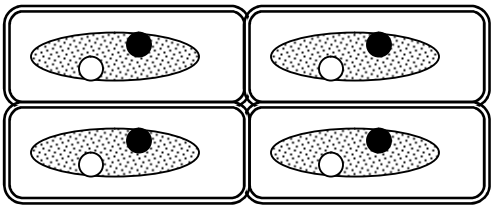
B.



C.



D.



17. Arrange the following statement in the correct order to show the process of facilitated diffusion.

I. The molecules bind to the active site of the carrier protein.
II. The protein changes its shape to allow the molecules to pass through the plasma membrane.
III. No energy is needed and the carrier protein changes back to its original shape.
IV. Substances which are not soluble in lipids will accumulates outside the plasma membrane.

A. I, II, IV , III
B. II, III, I , IV
C. IV, I, II, III
D. IV, II, III, I

18. The figure shows a tissues.

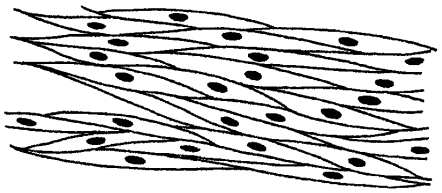
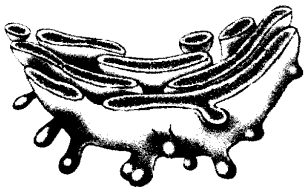
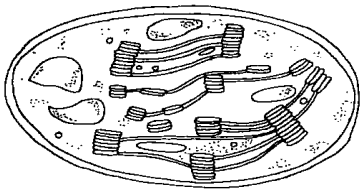


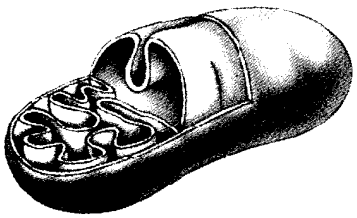
Figure 11

Which organelle is found in abundance in the tissues as shown above?

A 

B 

C 

D 

19. Which of the following comparisons between haemolysis and plasmolysis are true?

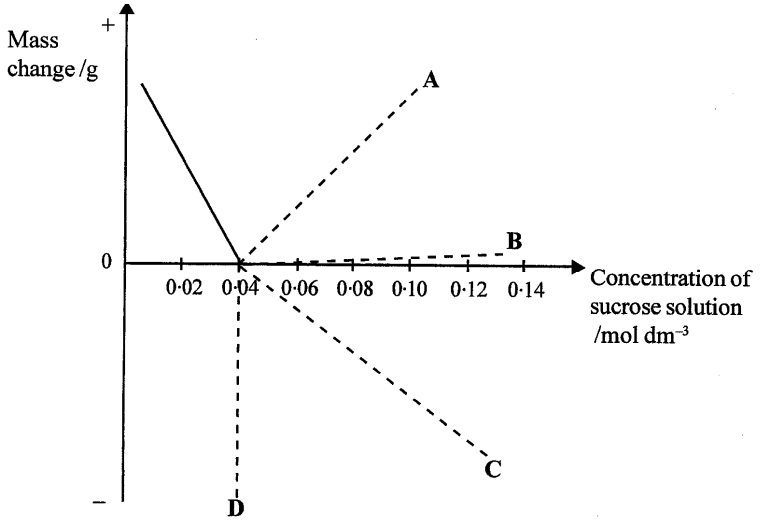
	Haemolysis	Plasmolysis
I	Occurs in hypertonic solutions	Occurs in hypotonic solutions
II	Occurs in red blood cells	Occurs in plant cells

III	Cells burst out	Protoplasm and vacuole shrinks
IV	Water diffuse out from the cell	Water diffuse into the cell.

A. II and III only
B. I and III only
C. I, II and III only
D. I, II, III and IV

20. An experiment was carried out to investigate the effect of concentration of sucrose solution on the mass of potato.
The initial mass of potato pieces was obtained. They were left in sucrose solution and the final mass was obtained.
The graph shows the result of the experiment.

Which of the graphs **A, B, C or D** may be expected if the concentration of the sucrose solution is increased beyond 0.04 mol dm^{-3} ?



Section B

Answer **all** the questions from this section.

1.

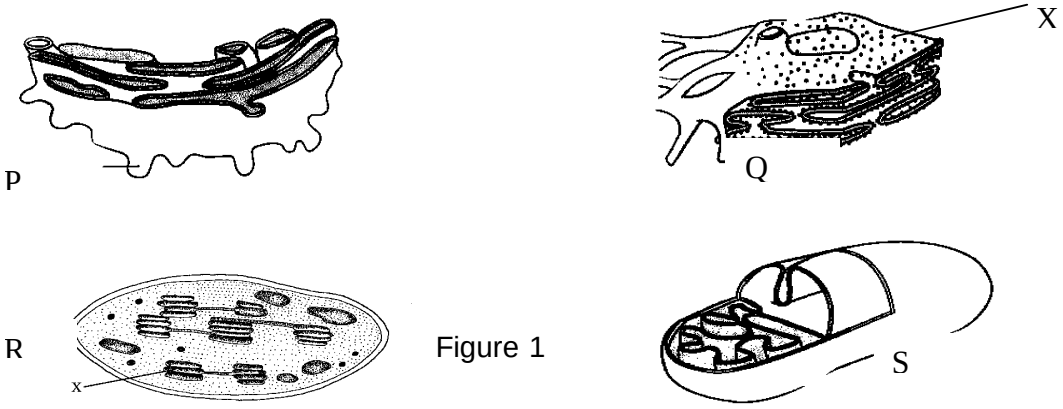


Figure 1

Figure above shows the organelles of P, Q, R and S found in plant cell.

a) i) Name the organelles of P, Q, R and S

P : .....

Q : .....

R : .....

S : .....

[2 marks]

ii) State the function of P and S organelle

Function of P : .....

.....

Function of S : .....

.....

[2 marks]

b) i) Name the process that takes place at R organelle ?

.....

[1 mark]

ii) State where light and dark reaction occurs at R.

.....

.....

[1 mark]

c) Name the part labeled X at Q and explain its function.

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[3 marks]

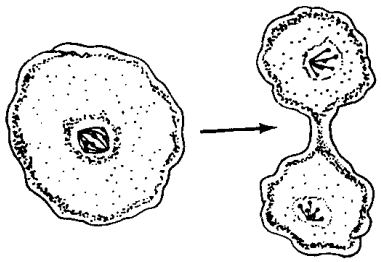
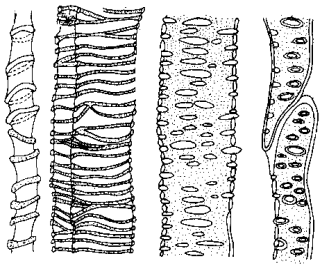


Figure 2

K



L

d) (i) What type of cell is shown by K and L?

.....

[1 mark]

(ii) Explain the living process shown by K.

.....

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[2 marks]

(iii) Describe how the cell at L differ from a typical plant cell.

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[2 marks]

2. Figure 3 shows a plant cell as seen under an electron microscope.

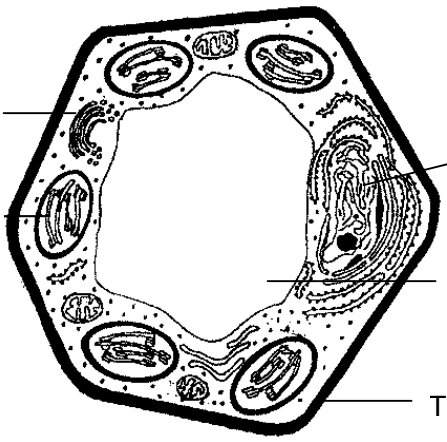

Figure 3

a) (i) On figure 3, label the structures P, Q, R ,S and T. *[2 marks]*

(ii) State the function of structure:

P : .....
.....

S : .....
.....

T : .....
.....

[3 marks]

b) Explain the role of S to maintain cell turgidity.

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.....

.....

[2 marks]

c) Every somatic cell which contains structure Q has a potential to form a complete new organism.

(i) Name the technique used to produce new plants in large quantities.

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[1 mark]

(ii) By using one suitable part of the plant, explain the technique in 1 (c) (i).

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[4 marks]

3.

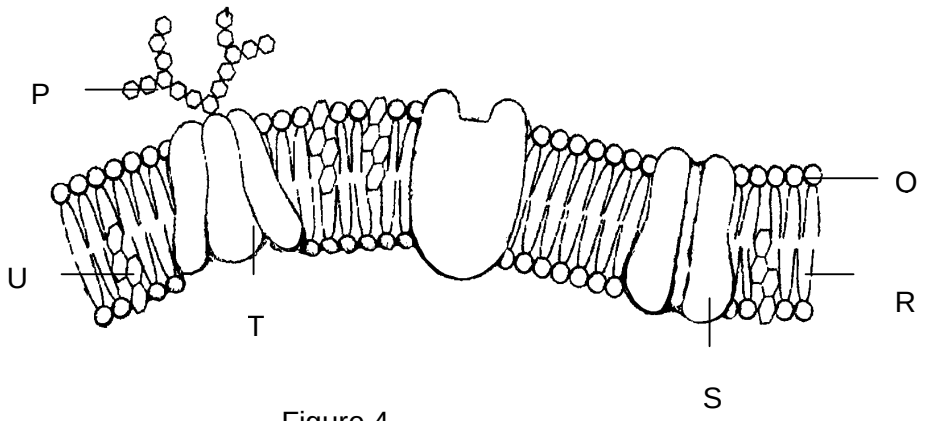

Figure 4

a) Label the structures of P, Q, R, S , T and U.

P : .....

Q : .....

R : .....

S : .....

T : .....

U : .....

[2 marks]

b) What is the name of this plasma membrane.

.....

[1 mark]

c) Describe the permeability of the plasma membrane.

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[2 marks]

d) (i) State one molecule that can pass through the following structures
(ii) State how the molecule/ particles able to move across each of the following structures.

Structure	Molecule	Molecule movement across the membrane
R		
S		
T		

[3 marks]

e) Explain how the particle you suggested in (d) moves across T.

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[3 marks]

f)

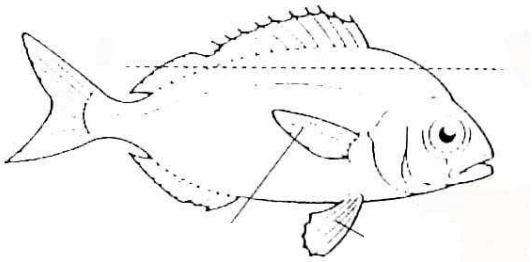

Figure 5

With your knowledge from question (d) (ii), describe how the above figure can be preserved.

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[3 marks]

Section C

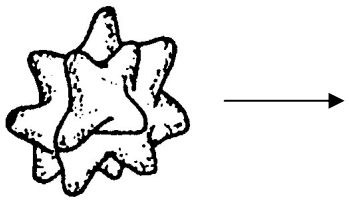
4. (a) Compare and contrast an animal cell and a plant cell.

[4 marks]

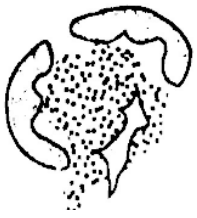
(b) Describe cell organization in the formation of tissues, organs and system in multicellular organisms.

[6 marks]

(c)



Red blood cells in 3% sodium chloride solution after 30 minutes



Red blood cells in 0.1% sodium chloride solution after 30 minutes

Figure 6

Figure 6 shows an animal cell immersed in different salt solutions.

Explain what happened to the red blood cell in 3% of sodium chloride solution and 0.1% of sodium chloride solution after being immersed for half an hour.

[6 marks]

(d)

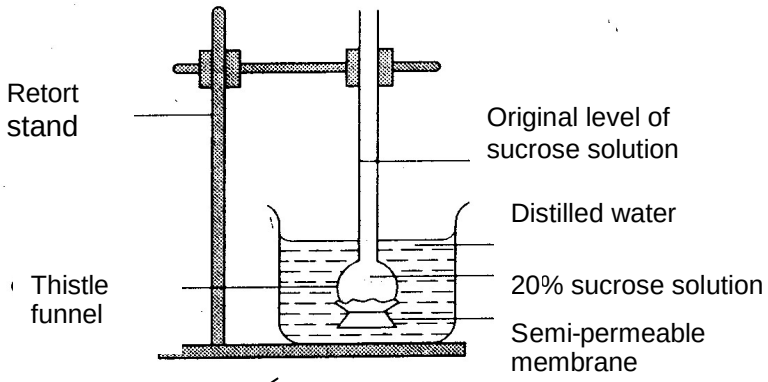


Figure 7

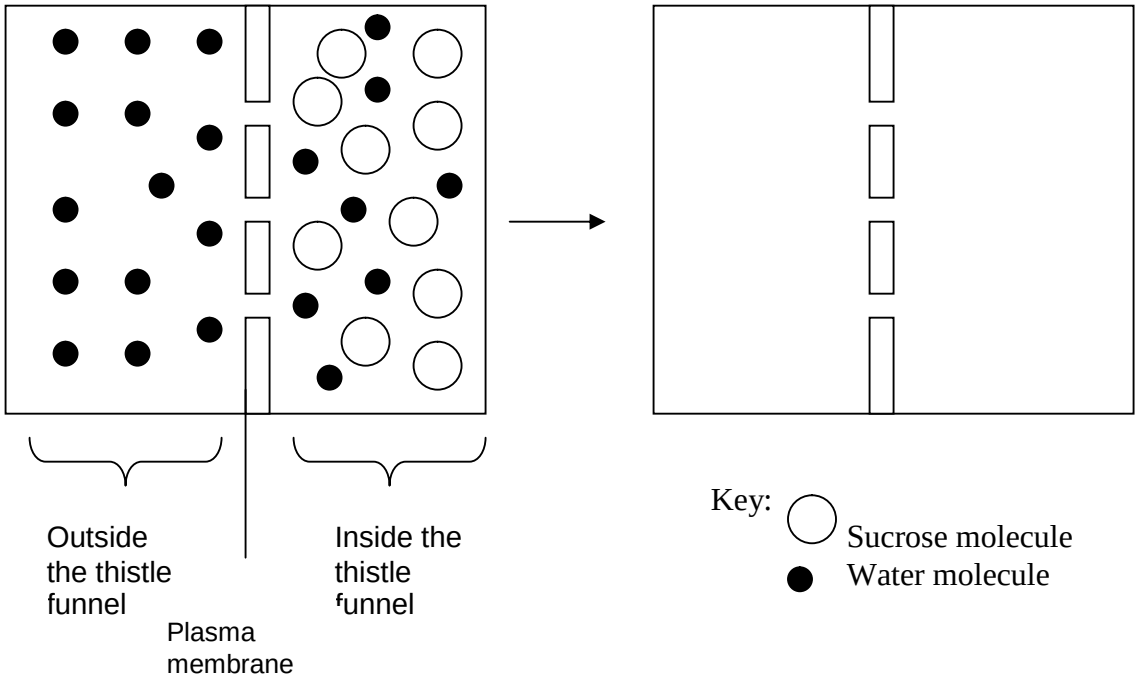


Figure 7 shows an experiment to study the movement of substances across the plasma membrane by using a simple osmometer.

(i) Complete the molecular drawing in the box provided to show the movement of substances.
(ii) Explain the movement of molecules across the plasma membrane.

[4 marks]

5. A housewife made fruit pickles using unripe mango. During the preparation, she placed the mango slices in water and later placed them in sugar solution.

When the mango slices were in the water, it was found that, the slices became turgid and their sizes increased. But when they were placed in the sugar solution, the slices became soft and shrunken.

Based on the above situation, plan a laboratory experiment to determine the concentration of sucrose which is isotonic to the cell sap of the mango.

The planning of your experiment must include the following aspects:

- Problem statement
- Aim of investigation
- Hypothesis
- Variables
- List of apparatus and materials
- Technique used
- Experimental procedure or method
- Presentation of data
- Conclusion

[17 marks]

Modul biology 1 : 1. CELL STRUCTURE & CELL ORGANISATION
2. MOVEMENT OF SUSTANCES ACROSS THE PLASMA MEMBRANE

END OF MODUL ONE