IGCSE · Edexcel · Biology

10 questions

Practice test

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Total Marks **/85**

1 (a) Bread contains starch.

Describe how you would test a piece of bread to show it contains starch.

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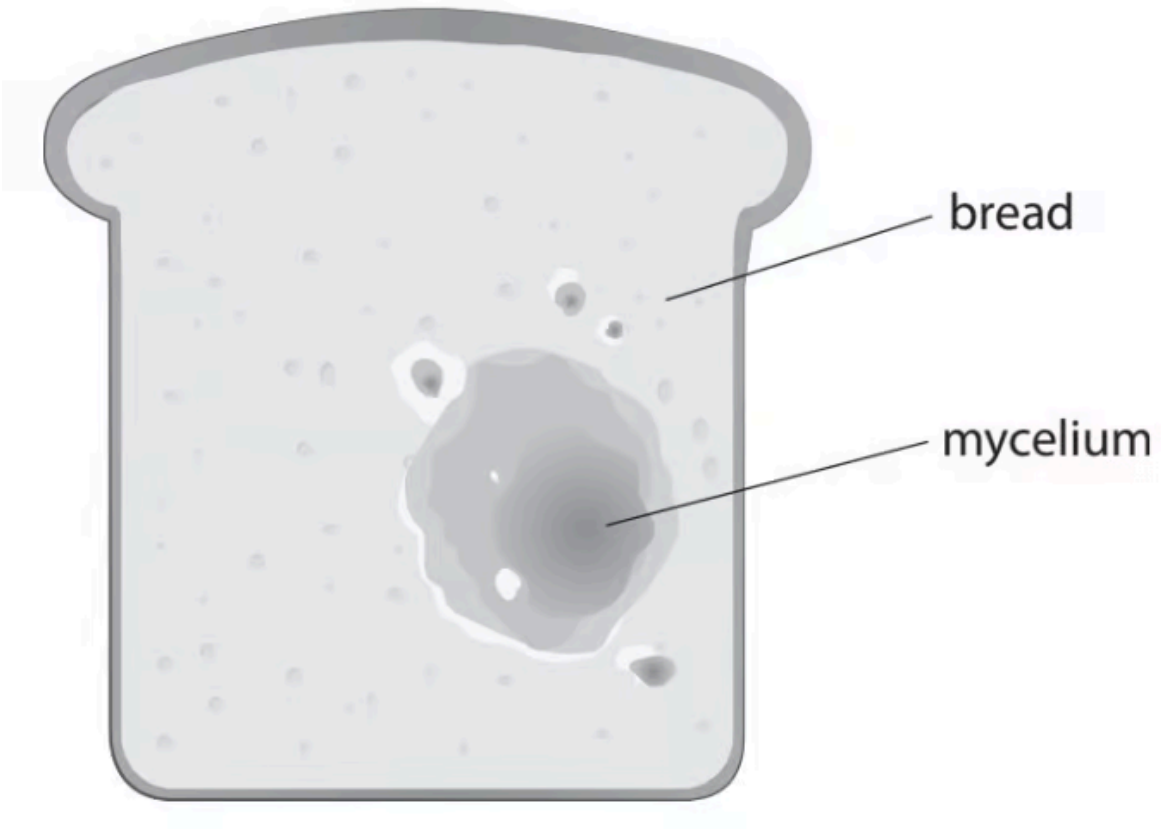
(2 marks)

(b) The diagram shows the mycelium of an organism growing on a piece of bread.



(i) Which type of organism is shown growing on the bread?

(1)

☐	**A**	Bacterium
☐	**B**	Fungus
☐	**C**	Protoctist
☐	**D**	Virus

(ii) Which enzyme is released by the organism to digest starch?

(1)

☐	**A**	Amylase
☐	**B**	Ligase
☐	**C**	Lipase
☐	**D**	Protease

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(2 marks)

2 (a) Organisms must transport substances to and from the external environment.

Identify **one** substance which cells must transport across the cell membrane to support cell functions.

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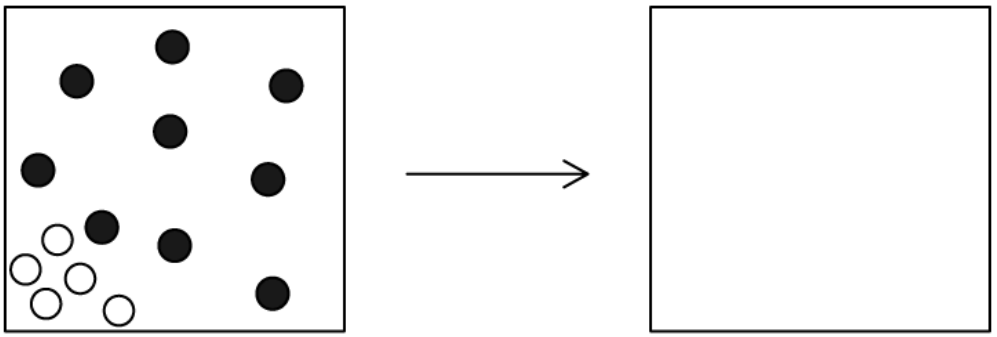
(1 mark)

(b) The diagram shows particles of two gases.



Complete the diagram by drawing the arrangement of the gas particles after 1 hour.

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(1 mark)

(c) Name the process shown in part (b).

.....

(1 mark)

(d) Which of the following is an example of simple diffusion?

☐	**A**	Movement of water into the root of a plant
☐	**B**	Movement of mineral ions into the root of a plant
☐	**C**	Movement of oxygen into the leaf of a plant
☐	**D**	Movement of glucose into the epithelial cells of villi in the small intestine

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(1 mark)

3 (a) Which of the following correctly shows the levels of organisation in an organism in order of size from the smallest to the largest?

☐	**A**	Organelle, cell, organ, tissue, organ system
☐	**B**	Organelle, cell, tissue, organ, organ system
☐	**C**	Cell, organelle, tissue, organ, organ system
☐	**D**	Cell, tissue, organelle, organ, organ system

(1 mark)

(b) State the meaning of the term **organ**.

(2 marks)

(c) Name an example of an organ found in the following groups of organisms:

(i) Plants

(1)

(ii) Animals

(1)

(2 marks)

(d) Give two differences between organisms in the plant group and organisms in the animal group.

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(2 marks)

4 (a) Plant roots absorb water from soil.

This water is transported to the leaves and then moves into the air.

Identify which of these processes is used to absorb water from the soil.

☐	**A**	Active transport
☐	**B**	Diffusion
☐	**C**	Evaporation
☐	**D**	Osmosis

.....

(1 mark)

(b) Name the tissue that transports water to the leaves.

.....

(1 mark)

(c) Separate: Biology Only

Name the process that moves water vapour into the air.

.....

(1 mark)

(d) Separate: Biology Only

Identify which of these reduces the movement of water from the leaves into the air.

☐	**A**	High light intensity
☐	**B**	Low air humidity
☐	**C**	Low air temperature
☐	**D**	Windy conditions

(1 mark)

(e) Give two uses of water in a plant.

(2 marks)

5 (a) Different groups of organisms have different features.

Complete the table by placing a tick [✓] in the boxes to show which features are present in each group of organisms.

Some have been completed for you.

Group	Cells have a cell wall	Cells are eukaryotic	Can carry out saprotrophic nutrition
Fungi			
Bacteria	✓		
Plant		✓	

(3 marks)

(b) Plants are able to store carbohydrates in their cells as starch or sucrose.

(i) Explain how plants are able to synthesise starch.

(2)

(ii) Describe the test that could be carried out to determine whether or not a plant cell contains starch.

(2)

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(4 marks)

(c) One of the features of plant cells is that they contain chloroplasts.

Suggest why root hair cells in plants do not contain chloroplasts.

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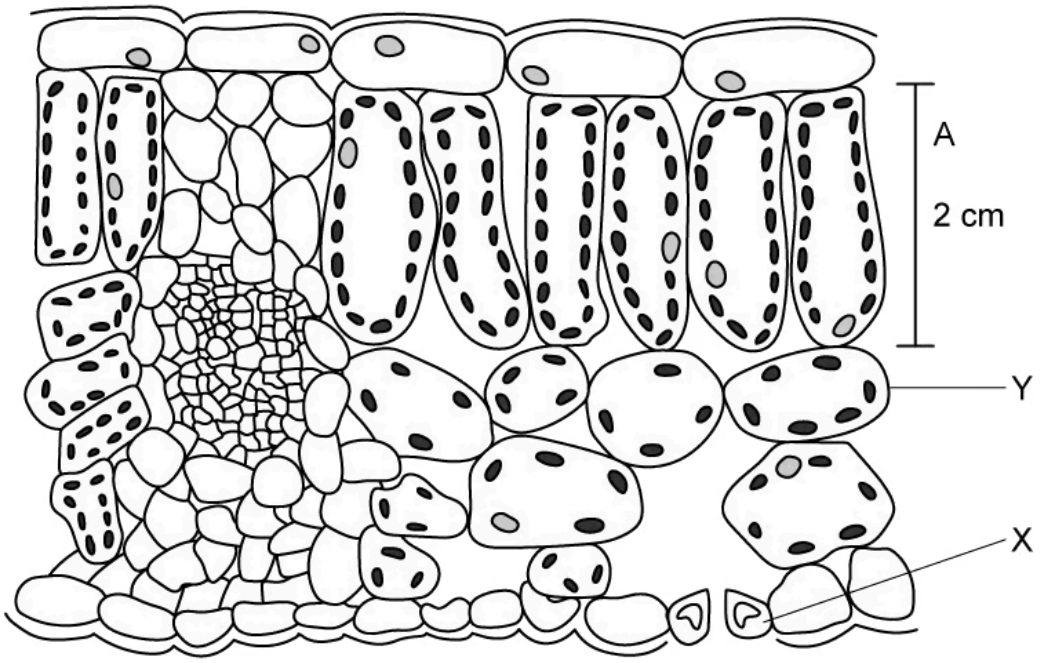
(2 marks)

6 (a) Separate: Biology Only

The image shows the cross section of a leaf.



(i) Identify the cells labelled **X** and **Y**.

(2)

(ii) Describe how the arrangement of cells such as Y help to maximise gas exchange in the leaf.

(2)

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(4 marks)

(b) Separate: Biology Only

Complete the table by adding an **X** to correctly identify the processes involved in controlling the opening and closing of the stomata.

	Water moves in to guard cells	**Water moves out of guard cells**	**Cells become flaccid**	**Cells become turgid**
Stomata open				
Stomata close				

(2 marks)

(c) Separate: Biology Only

Explain why plants only absorb carbon dioxide during the day.

(2 marks)

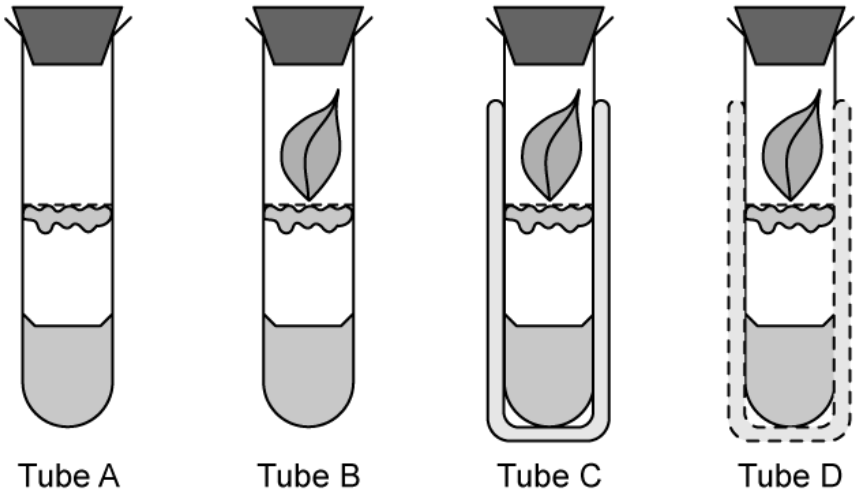
(d) Separate: Biology Only

Some students set up an investigation into the effect of light on gas exchange in plants.They set up four boiling tubes as follows:

- Tube **A** contained no leaf
- Tube **B** contained a leaf and was placed in sunlight
- Tube **C** contained a leaf but sunlight was blocked out using tin foil

- Tube **D** contained a leaf but sunlight was partially blocked out using gauze

The students used hydrogen carbonate indicator to show the changes in carbon dioxide level for the four tubes over 30 minutes. Hydrogen carbonate indicator is an orange solution that turns yellow when carbon dioxide levels are high, and purple when carbon dioxide levels are low.



Explain the outcome that will be observed for the following:

(i) Tube B.

(2)

(ii) Tube C.

(2)

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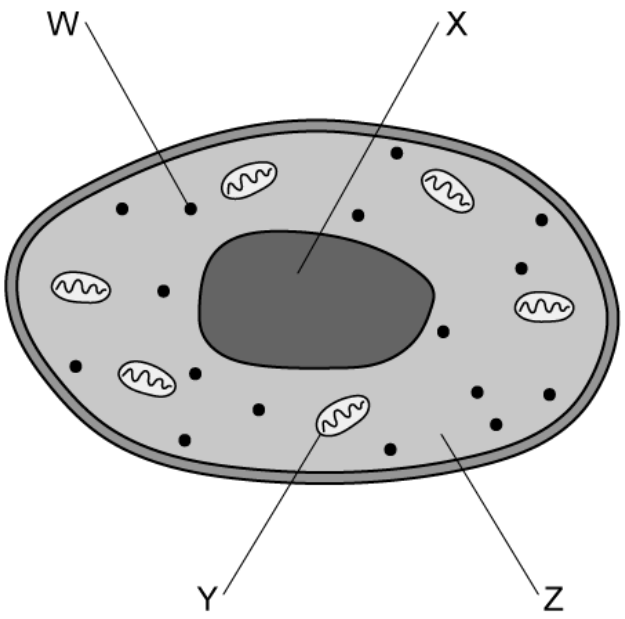
(4 marks)

7 (a) Which of the following statements relating to respiration is **not** correct?

☐	**A**	Respiration produces ATP
☐	**B**	Respiration involves the breaking of bonds within biological molecules
☐	**C**	Respiration occurs in animals but not in plants
☐	**D**	Respiration releases energy in the form of heat

(1 mark)

(b) The diagram shows an animal cell.



(i) Identify the letter, from **W**-**Z**, that indicates the sub-cellular structure where respiration takes place.

(1)

(ii) Name the sub-cellular structure identified in part (i),

(1)

.....

.....

(2 marks)

(c) Complete the following sentence about respiration:

glucose	chemical	protein	cell
muscle	temperature	nerve	

Respiration releases energy from ..... . The energy release can be used in life processes such as ..... reactions, ... contraction and maintaining a constant body ..... .

.....

.....

.....

.....

(4 marks)

(d) Complete the table with a (✓) or a (**X**) to show the products and reactants of aerobic respiration in animals.

	Product	Reactant
Oxygen		
Carbon dioxide		
Lactic acid		
Glucose		
Water		
Ethanol		

.....

.....

(2 marks)

8 (a) Write the balanced symbol equation for respiration

.....

.....

(2 marks)

(b) Some scientists wanted to investigate respiration rates in different areas of a plant.

They measured carbon dioxide production in the roots and leaves of a plant at night time.

The table shows the rate of carbon dioxide production that they measured.

Part of the plant	Mean rate of carbon dioxide production / $cm^3\ m^{-2}\ s^{-1}$
Leaves	0.042
Root	0.056

Calculate the percentage difference in carbon dioxide production in the leaves compared to the roots.

.....

.....

.....

(3 marks)

(c) The carbon dioxide readings shown in the table in part (b) were all taken during the night time.

Suggest a reason for this.

.....

(3 marks)

(d) Suggest an explanation for the results shown in the table in part (b).

(2 marks)

(e) In order to collect the data about carbon dioxide produced by the roots of the plant, scientists took samples of the air from the soil around the plant roots and adjusted it to account for atmospheric carbon dioxide levels.

Suggest why the readings they took may still be higher than the actual rate of carbon dioxide production in the plant roots.

(1 mark)

9 (a) A teacher carries out a demonstration to show the effect of different concentrations of salt solution on red blood cells.

This is the teacher's method.

- Dilute a sample of blood using a salt solution that has the same concentration as blood plasma
- Place 1 cm^3 of the diluted blood into each of three test tubes labelled A, B and C
- Add 10 cm^3 of water to tube A
- Add 10 cm^3 of 1 % sodium chloride solution to tube B
- Add 10 cm^3 of 5 % sodium chloride solution to tube C
- Leave each tube for 5 minutes
- Compare the cloudiness of the solutions in the three test tubes
- Take a drop of liquid from each tube and put on separate microscope slides
- Observe each slide under a microscope

State the independent variable in this investigation.

.....

(1 mark)

(b) Give one variable that the teacher controls in this investigation.

.....

(1 mark)

(c) After 5 minutes, these are the teacher's observations.

- Tube A – a clear red solution
- Tube B – a cloudy red suspension
- Tube C – a cloudy red suspension

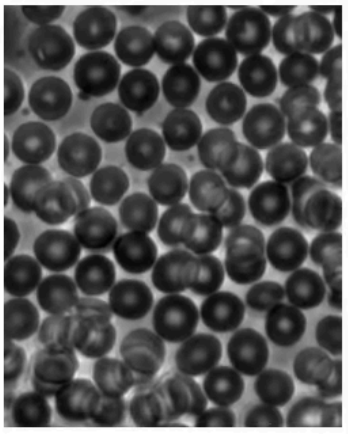
(i) Explain the differences in the teacher's observations.

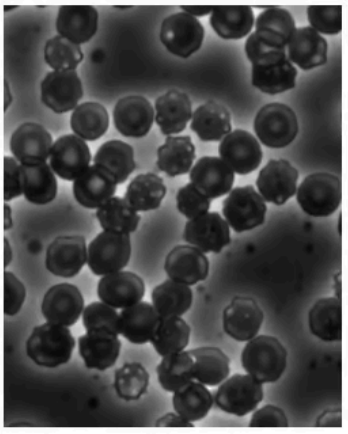
(2)

(ii) When the teacher looks down a microscope for cells on each slide, these are the teacher's observations.

- Slide from tube A – no cells are seen
- Slide from tube B – normal biconcave red cells are seen
- Slide from tube C – red cells are seen but the cells have shrunken edges

The photographs show the teacher's observations.





Tube A	Tube B	Tube C

Zephyris, CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons

Explain the differences between the teacher's observations of the slides from each tube.

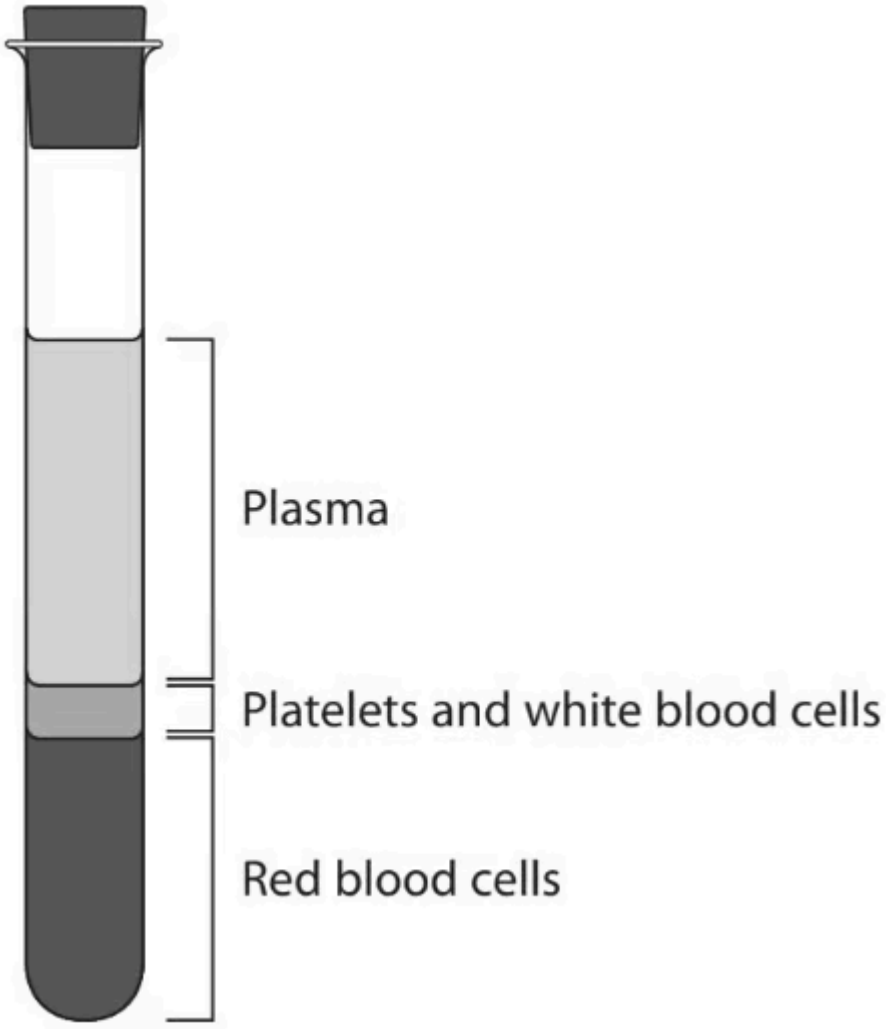
(2)

(4 marks)

(d) Blood samples can be separated into different layers using a centrifuge.

This is a machine that spins blood at a high speed.

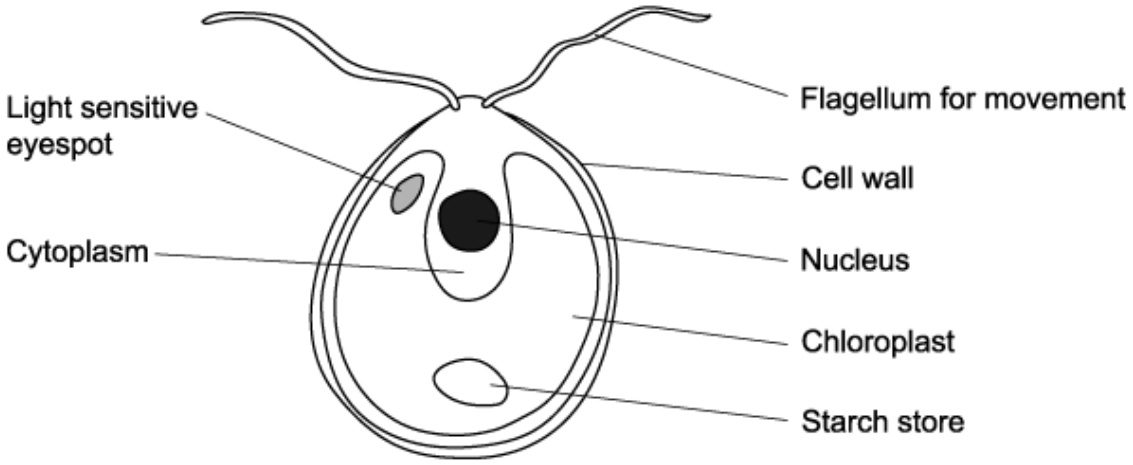
A new sample of blood is shown after it has been spun in a centrifuge.



Describe how the blood in tubes A, B and C from the teacher's demonstration would look after they had been spun in a centrifuge.

(2 marks)

10 (a) The image below shows a single-celled organism known as *Chlamydomonas*.



(i) Suggest the group of organisms to which *Chlamydomonas* belongs.

(1)

(ii) Explain your answer to part (i).

(2)

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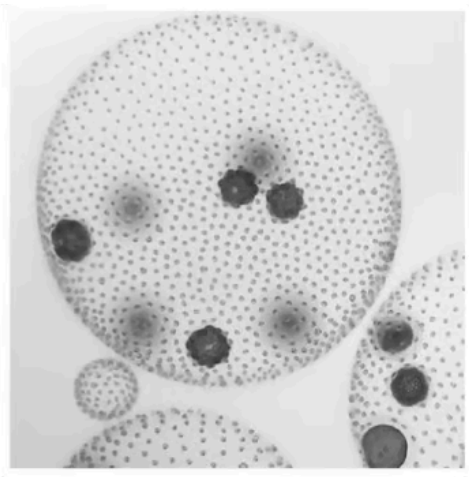
(3 marks)

(b) A group of organisms closely related to *Chlamydomonas*, known as *Volvox*, forms multicellular structures. *Volvox* consists of a hollow ball surrounded by an outer layer of cells.

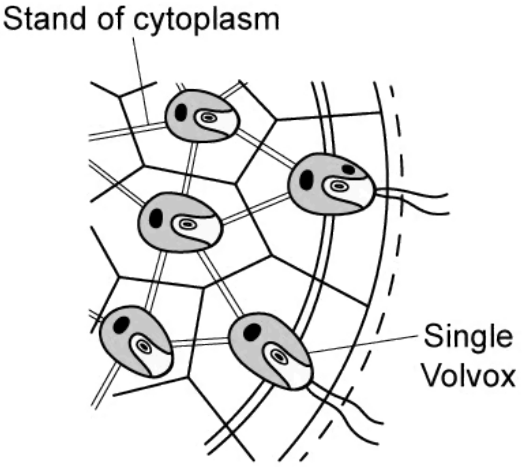
Volvox contains two types of cell:

- Somatic cells which surround the hollow ball to form an outer layer. These cells are unable to divide to produce more cells, but they have flagella which they can use for movement. Somatic cells are similar in structure to *Chlamydomonas* in part (a).
- Gonidia cells are large cells which are visible as denser regions within the hollow ball. These cells can divide and give rise to new *Volvox*.

The structure of *Volvox* is shown in the images below.



Adult *Volvox*.



The cellular structure of *Volvox*.

Frank Fox, via Wikimedia Commons (left)

(i) Use the information provided to suggest why *Volvox* is not considered to have tissues or organs.

(2)

(ii) *Volvox* is thought to be a useful model for studying the evolutionary transition between single-celled and multi-cellular organisms.

Suggest why this is the case.

(2)

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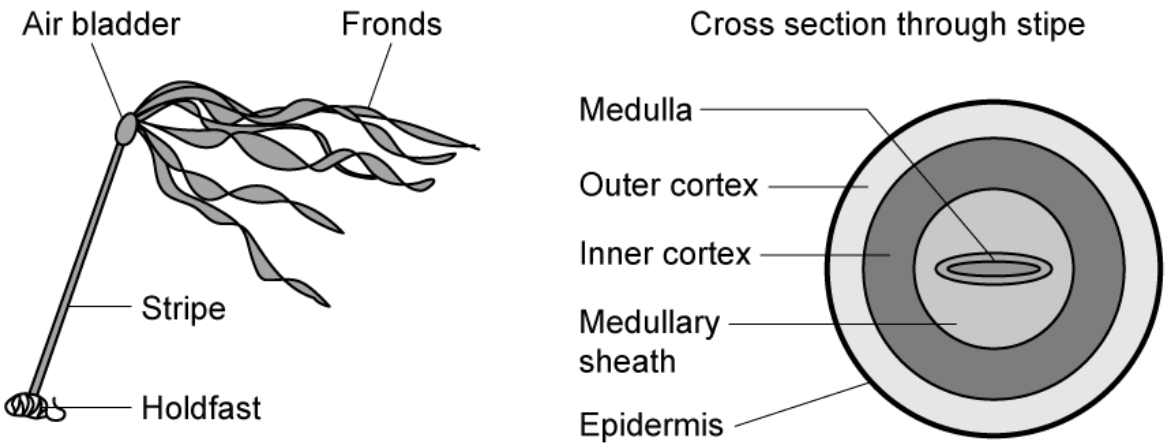
(4 marks)

(c) The group of organisms to which *Chlamydomonas* and *Volvox* belong also includes seaweeds such as kelp.

Some of the structures in kelp can be seen in the diagram below.



Describe the differences in structural organisation of kelp with that of Volvox in part (b).

(3 marks)

(d) Kelp is a type of seaweed, a plant-like organism that gains its food by photosynthesising. Kelp grows by attaching itself to the sea bed with a structure known as a holdfast, allowing the fronds to extend towards the water's surface.

The medulla within the stipe of kelp, shown in part (c), contains cells known as hyphae which transport substances from one part of the kelp to another.

(i) Suggest why the hyphae in the medulla are crucial to the growth of the kelp.

(4)

(ii) Name one other group of organisms in which hyphae can be found.

(1)

(5 marks)