

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

Four leaves were removed from the same plant. Petroleum jelly (a waterproofing agent) was spread onto some of the leaves, as follows:

Leaf **A**: on both surfaces

Leaf **B**: on the lower surface only

Leaf **C**: on the upper surface only

Leaf **D**: none applied

Each leaf was then placed in a separate beaker, as shown in diagram 1.

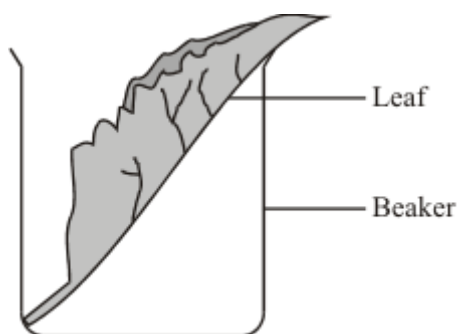
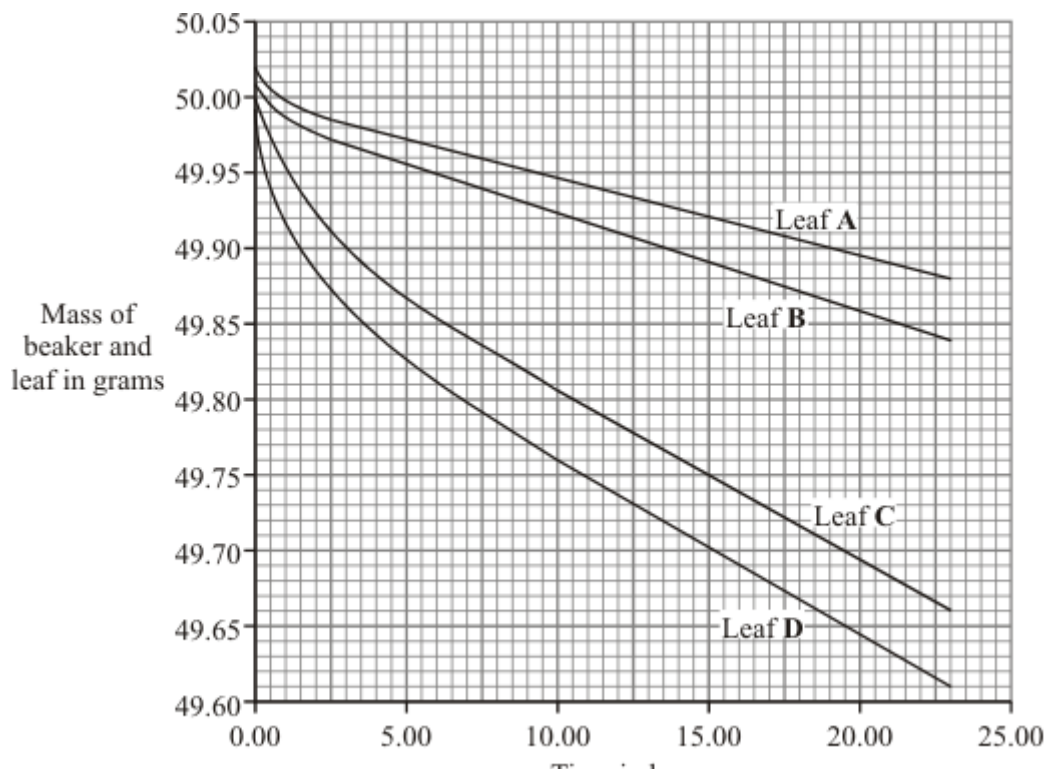


Diagram 1

Each beaker was weighed at intervals. The results are shown in the graph.



(a) Give evidence from the graph in answering the following questions.

(i) Which surface (upper or lower) loses water most rapidly? _____

Evidence _____

(1)

(ii) Is water lost from both surfaces of the leaf? _____

Evidence _____

(1)

(b) Diagram 2 shows the appearance of each surface of the leaf as seen through a microscope.

Upper Surface of Leaf

Lower Surface of Leaf

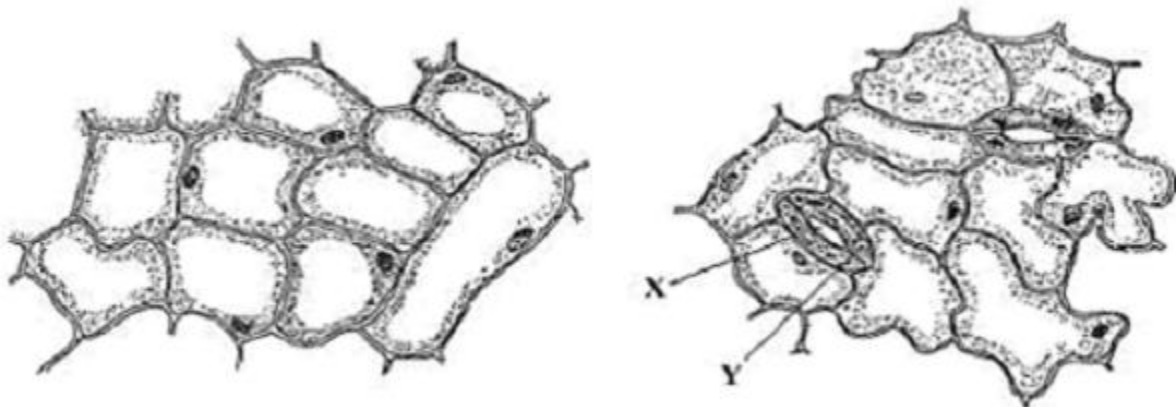


Diagram 2

- (i) Name space **X** and cell **Y**.

X _____

Y _____

(2)

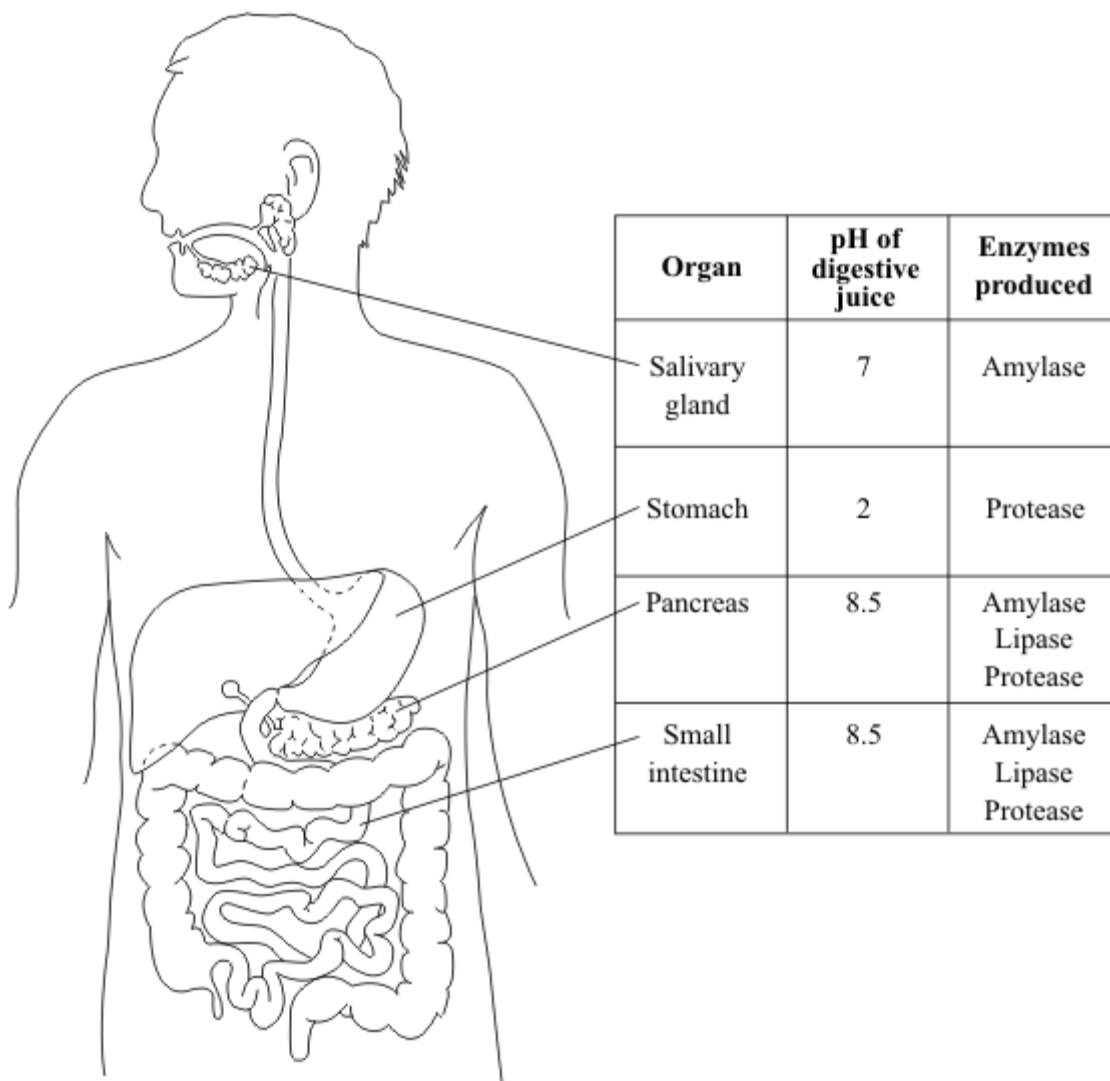
- (ii) Use information in diagram **2** to explain why the results are different for leaves **B** and **C**.

(2)

(Total 6 marks)

Q2.

The diagram gives information about some parts of the human digestive system.



- (a) (i) Name the organ which **makes** bile.

(1)

- (ii) Label this organ with the letter **X** on the diagram.

(1)

Information in the table may help you to answer parts (b) and (c).

- (b) Name **two** parts of the digestive system where protein is digested.

1. _____

2. _____

(2)

- (c) Suggest **two** reasons why starch is not digested in the stomach.

1. _____

2. _____

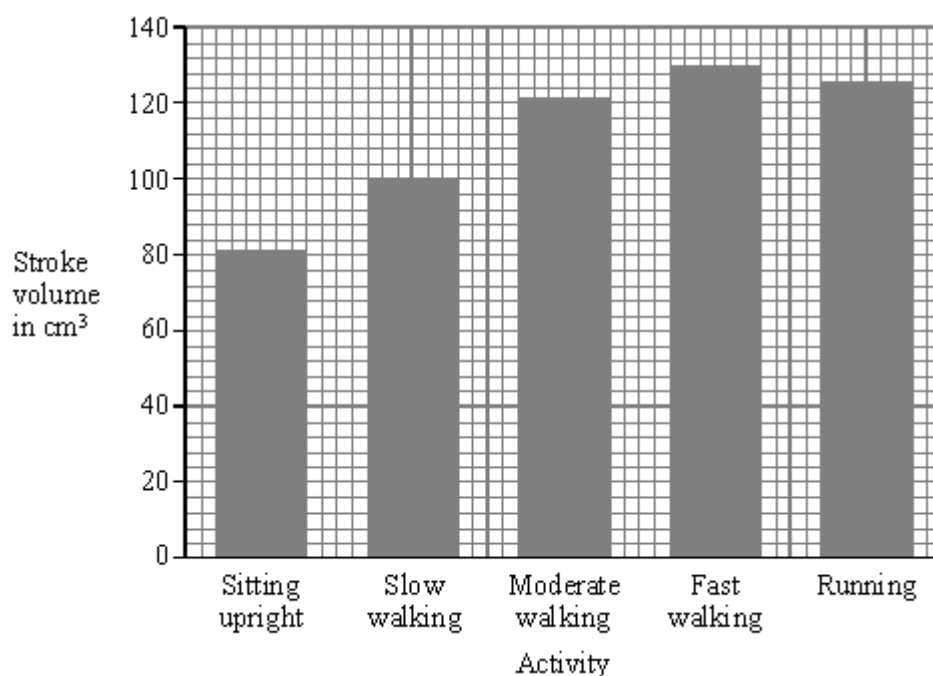
(2)
(Total 6 marks)

Q3.

A person did five different activities in turn. These activities needed increasing amounts of energy. For each activity two measurements were made. These were the rate of contraction of the left ventricle and its stroke volume (the volume of blood pumped at each beat). From these measurements the cardiac volume was calculated.

Some of these results are shown in the table and the bar chart.

Activity	Rate of contraction of left ventricle in beats per minute	Cardiac output in cm^3 per minute
Sitting upright	68	5 500
Slow walking		8 000
Moderate walking	98	12 000
Fast walking	130	17 500
Running	150	19 000



- (a) (i) Describe how a person can count the rate of beating of the left ventricle.

(1)

- (ii) Calculate the rate of ventricle contraction in beats per minute when the person was walking slowly. Show clearly how you work out your final answer.

Rate of ventricle contraction _____ beats per minute.

(2)

- (iii) The pattern of results for stroke volume shows an anomalous result when the person is running. In what way is it anomalous?

(1)

- (iv) There was a change in cardiac output when the person's movement changed from fast walking to running. How did the heart produce this change?

(1)

- (b) Over a period of time, regular exercise can strengthen the heart muscle. This change in the heart muscle enables a person to run for longer before lactic acid build up occurs. Explain the reason for this.

(2)

(Total 7 marks)