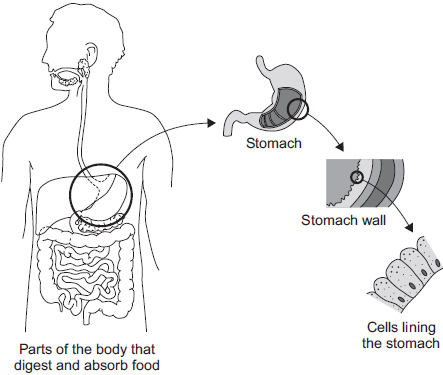
**Q1.**The diagram below shows the parts of the body that digest and absorb food.

It also shows some details about the structure of the stomach.



(a)     Complete the table to show whether each structure is an organ, an organ system or a tissue.

For each structure, tick () **one** box.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Structure** | **Organ** | **Organ system** | **Tissue** |
|  | Stomach |  |  |  |
|  | Cells lining the stomach |  |  |  |
|  | Mouth, oesophagus, stomach, liver, pancreas, small and large intestine |  |  |  |

**(2)**

(b)     (i)      The blood going to the stomach has a high concentration of oxygen.

The cells lining the stomach have a low concentration of oxygen.

Complete the following sentence.

Oxygen moves from the blood to the cells lining the stomach by

the process of ..................................................................... .

**(1)**

(ii)     What other substance must move from the blood to the cells lining the stomach so that respiration can take place?

Draw a ring around the correct answer.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **glucose** | **protein** | **Starch (1)** |

(iii)    In which part of a cell does aerobic respiration take place?

Draw a ring around the correct answer.

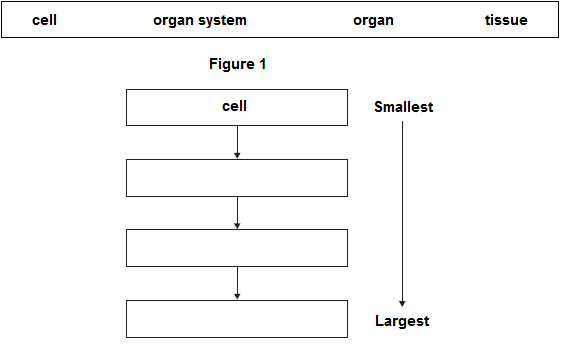
|  |  |  |  |
| --- | --- | --- | --- |
|  | **cell membrane** | **mitochondria** | **Nucleus (1)** |

**(Total 5 marks)**

**Q2.**The human body is organised to carry out many different functions

(a)     Use words from the box to complete **Figure 1** by putting the parts of the body in order of size from smallest to largest.

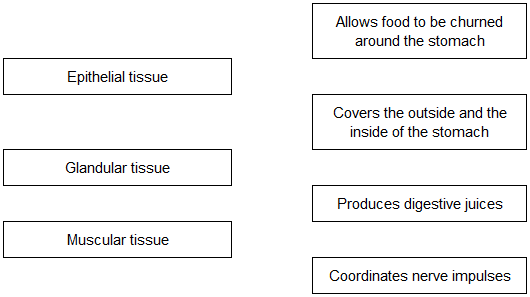
The smallest one has been done for you.



**(2)**

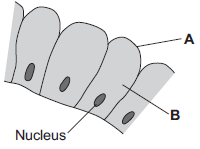
(b)     The stomach is made of different types of tissue.

Draw **one** line from each type of stomach tissue to the correct description.



**(3)**

**Q3.**The image below shows some cells in the lining of the stomach.



(a)     (i)      Use words from the box to name structures **A** and **B**.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **cell membrane** | **chloroplast** | **cytoplasm** | **vacuole** |

**A** ..........................................................................

**B** ..........................................................................

**(2)**

(ii)     What is the function of the nucleus?

Tick () **one** box.

|  |  |  |
| --- | --- | --- |
|  | To control the activities of the cell |  |
|  | To control movement of substances into and out of the cell |  |
|  | To release energy in respiration |  |

**(1)**

(b)     Draw **one** line from each part of the human body to its correct scientific name.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Part of human body** |  | **Scientific name** |
|  |  |  | An organ |
|  | Layer of cells lining the stomach |  |  |
|  |  |  | An organism |
|  | Stomach |  |  |
|  |  |  | An organ system |
|  | Mouth, stomach, intestines, liver and pancreas |  |  |
|  |  |  | A tissue |

**(3)**

**(Total 6 marks)**

**Q5.**          The body uses enzymes to digest (break down) large food molecules into smaller molecules.

(a)     (i)      Draw **one** line from **each** large food molecule to the enzyme that acts on it.

|  |  |  |
| --- | --- | --- |
| **Large food molecule** |  | **Enzyme** |
|  |  | amylase |
| starch |  |  |
|  |  | protease |
| fat |  |  |
|  |  | lipase |
| protein |  |  |
|  |  | isomerase |

**(3)**

(ii)      Draw a ring around the correct answer to complete each sentence.

|  |  |
| --- | --- |
|  | amino acids. |
| Starch is broken down into | fatty acids and glycerol. |
|  | sugars. |

|  |  |  |  |
| --- | --- | --- | --- |
|  | amino acids. | | |
| Fat is broken down into | fatty acids and glycerol. | | |
|  | fructose. | | |
|  | | amino acids. |
| Protein is broken down into | | fructose. |
|  | | sugars. |

**(3)**

(b)     Bile helps digestion.

Where is bile produced?

Draw a ring around **one** answer.

|  |  |  |
| --- | --- | --- |
| **liver** | **mouth** | **stomach** |

**(1)**

**(Total 7 marks)**

##

          (a)     Complete the table to give one site where digestive substances are made.

|  |  |
| --- | --- |
| **Digestive substance** | **One site of production** |
| bile |  |
| amylase |  |
| lipase |  |
| protease |  |

**(4)**

(b)     Describe **two** ways that the mouth can break down starchy foods.

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

**(2)**

(c)     Describe how the liver helps to digest fats.

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

**(2)**

**(Total 8 marks)**

**Q7.**Amylase is an enzyme that digests starch.

A student investigated the effect of pH on the activity of amylase.

This is the method used.

1.      Mix amylase solution and starch suspension in a boiling tube.

2.      Put the boiling tube into a water bath at 25 °C.

3.      Remove a drop of the mixture every 30 seconds and test it for the presence of starch.

4.      Repeat the investigation at different pH values.

The table below shows the students’ results.

|  |  |  |
| --- | --- | --- |
|  | **pH** | **Time when no starch was detected in minutes** |
|  | 5.0 | 7.0 |
|  | 5.5 | 4.5 |
|  | 6.0 | 3.0 |
|  | 6.5 | 2.0 |
|  | 7.0 | 1.5 |
|  | 7.5 | 1.5 |
|  | 8.0 | 2.0 |

(a)     The student concluded pH 7.25 was the optimum pH for the amylase enzyme.

This is **not** a valid conclusion.

Suggest **two** reasons why.

1 .....................................................................................................................

........................................................................................................................

2 .....................................................................................................................

........................................................................................................................

**(2)**

(b)     The student did another investigation.

This is the method used.

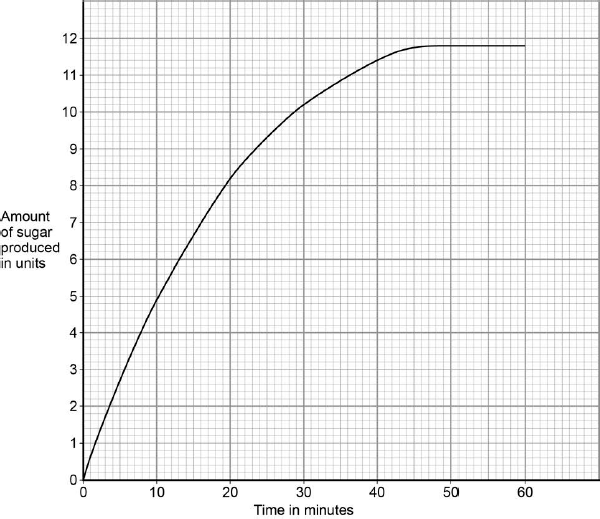
1.      Put amylase solution and starch suspension into a boiling tube.

2.      Make the pH 7.25.

3.      Put the boiling tube into a water bath at 25 °C.

4.      Measure the amount of sugar produced every 30 seconds.

The results are shown in the figure below.



Calculate the mean rate of sugar produced per minute during the first 5 minutes.

........................................................................................................................

........................................................................................................................

             Mean rate = ............................... units per minute

**(2)**

(c)     Iodine solution is added to a sample taken from the boiling tube after 10 minutes and 60 minutes.

Suggest what you would see in these samples.

After 10 minutes .............................................................................................

........................................................................................................................

.After 60 minutes ............................................................................................

........................................................................................................................

**(2)**

(d)     The scientist repeated the investigation at 37 °C.

Draw a line on the figure above to show the predicted results.

**(2)**

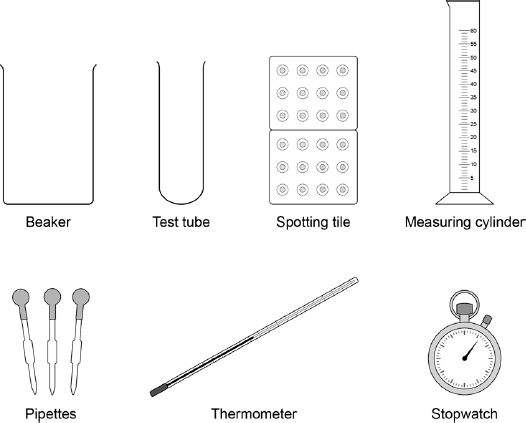
**(Total 8 marks)**

**Q8.**Amylase catalyses the breakdown of starch into sugars.

A student investigated the effect of amylase on the reaction at different temperatures.

**Figure 1** shows the apparatus the student used.

**Figure 1**

****

This is the method used.

1.       Put starch suspension into a test tube.

2.       Add amylase solution.

3.       Put the test tube in a beaker of water at 15 °C.

4.       Remove a small sample of the mixture every 30 seconds and put in a spotting tile.

5.       Test the sample for starch.

6.       Time how long it takes to break down all of the starch in the mixture.

7.       Repeat steps 1–5 at 20 °C, 25 °C and 30 °C.

8.       Repeat for each temperature twice more.

The table below shows the student’s results.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Time taken until there was no starch in the sample in minutes** | | | |
|  | **Temperature in °C** | **Test 1** | **Test 2** | **Test 3** | **Mean** |
|  | 15 | 6.1 | 9.4 | 10.0 | 8.5 |
|  | 20 | 4.8 | 5.0 | 4.6 | 4.8 |
|  | 25 | 3.0 | 2.5 | 3.0 | 3.2 |
|  | 30 | 1.5 | 2.0 | 2.0 |  |

(a)     One of the results in the table above is anomalous.

Draw a ring around the anomalous result.

**(1)**

(b)     Calculate the mean for 30 °C.

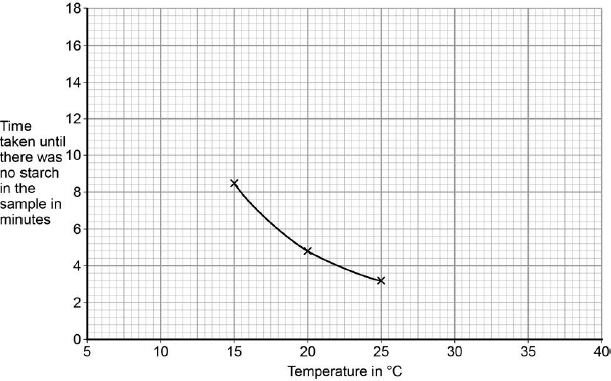
........................................................................................................................

........................................................................................................................

**(1)**

(c)     **Figure 2** shows a graph of the student’s results.

**Figure 2**

****

Use the graph to predict how long it would take to break down all of the starch at 10 °C.

                                Time = .................................. minutes

**(1)**

(d)     The student tested samples of the mixture for starch every 30 seconds.

In each test she added one drop of iodine to the sample in the spotting tile.

Predict the colour of the samples from the 20 °C test at 4.0 minutes and 7.0 minutes.

Colour at 4.0 minutes  ...................................................................................

Colour at 7.0 minutes  ....................................................................................

**(2)**

(e)     The student did a fourth test at 30 °C.

In this test the starch did not break down, even after 45 minutes.

Why did the amylase not break down the starch in this test?

Tick **one** box.

|  |  |  |
| --- | --- | --- |
|  | The amylase solution and the starch suspension were mixed before the start of the experiment. |  |
|  | The amylase solution had been prepared with water at 95 °C. |  |
|  | The amylase solution had been prepared with water at 20 °C. |  |
|  | The amylase solution had been stored in the fridge. |  |

**(1)**

(f)     The student made the following conclusion about the optimum temperature for amylase to work at.

                              ‘Amylase works fastest at 40 °C’

Her teacher said that this is **not** a valid conclusion from her results.

Describe how the student could change her method to give results that would improve the validity of her conclusion.

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**(6)**

**(Total 12 marks)**