Grade:9
Biology

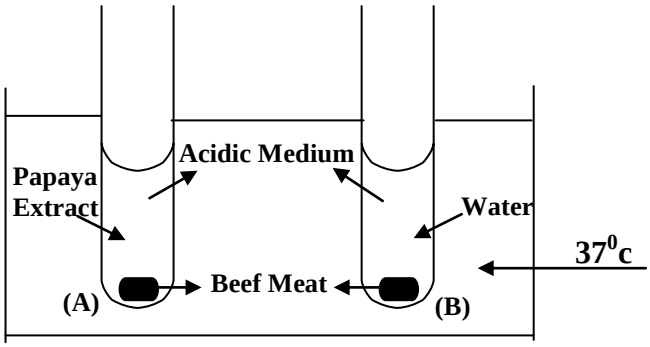
First Exercise (8 pts)

Beef meat contains about 13% lipids, 32% proteins and from 50% to 75% water.

1- How can we prove the presence of lipids in meat?
2- Proteins in meat undergo progressive digestion. Represent, using arrows, this progressive digestion.

Papaya (doc.1) is a fruit that grows mainly in Hawaii.
An experiment is done in vitro, using beef meat and the extract of Papaya fruit as shown in doc.2

Doc.1



Doc.2

The results of this experiment are shown in the following table:

	Time (in minutes)	0	30	60	90
% of mass of peptides	Tube (A)	0	35	70	100
	Tube (B)	0	0	0	0

Doc.3

Refer to doc.2 and doc.3 to answer the questions that follow.
3- Construct a table showing the experimental conditions and the results at the end of the experiment.
4- Analyze the result of the experiment in doc.3. Draw out a conclusion concerning the role of Papaya.
5- Specify the role of tube (B).
6- Deduce the content of Papaya fruit involved in the digestion of proteins.

The Papaya extract is heated above 118 degrees then cooled at 37⁰c. The same experiment, using this Papaya extract, is performed as in doc.3.
7- Choose the correct answer among the following. **Justify your choice**.
The results in tube A and B would be:
a) same as the first experiment.
b) different from the first experiment: there is no transformation in both tubes.
c) different only in tube (B).

Second Exercise (6.5 pts)

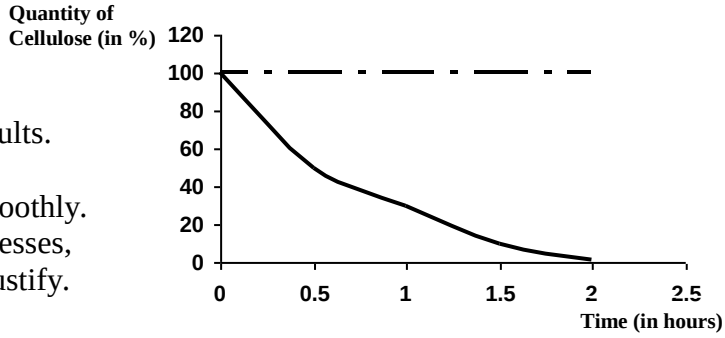
Read the text below then answer the questions that follow

Fibers are mainly made up of cellulose. A cellulose molecule is formed of a chain of glucose molecules. Fibers are a part of plant foods that our bodies do not break down during digestion. We can find about 8g of fibers in a half cup of lentils and 5g in a small apple. To keep the digestive tract working smoothly, an adult is advised to consume daily about 30g of fibers.

Constipation happens when food moves too slowly through the large intestine, often resulting in hard stool that is difficult to pass. Eating food rich in fibers helps to avoid constipation since fibers absorb water and thus soften stools, so they pass more easily.

Diarrhea occurs when undigested food moves too fast before the intestine can absorb water. Fibers' ability to absorb water helps make stools more solid, thus avoiding diarrhea.

The adjacent document shows the fate of cellulose in the digestive tract of a man and a rabbit.



1- Identify the class of food to which cellulose belongs. **Justify the answer.**
2- Interpret the two curves.
3- Formulate a hypothesis that explains the obtained results.
4- Determine the numbers of apples that an adult must consume daily to keep his digestive tract working smoothly.
5- Although constipation and diarrhea are opposite processes, eating fibers is advised in both cases to avoid them. Justify.

Third Exercise (5.5pts)

In order to study the role of liver on the variation of the glucose quantity in the blood, many measurements are done.
The following table represents the measured values.

	Quantity of Glucose (in g/L)	
Organ	**Blood Entering**	**Blood Leaving**
Small Intestine	**1**	**2**
Liver	**2**	**1**

1- Compare the quantity of glucose in the blood entering and leaving the small intestine.
2- a) Name the phenomenon responsible for the variation of the quantity of glucose through the small intestine.
b) Give the name of the intestinal structure where this phenomenon takes place.
c) List the characteristics of the intestinal wall that favor this phenomenon.

3- **After leaving the small intestine, the blood goes for the liver before being distributed to all body cells.**
a) Compare the quantity of glucose in the blood entering and leaving the liver.
b) Formulate a hypothesis on the role of liver.

Good Work