

First Exercise (8.5 points)

A) In order to determine the composition of some food : Avocado and kiwi, different experiments are performed and the results are represented by the following table:

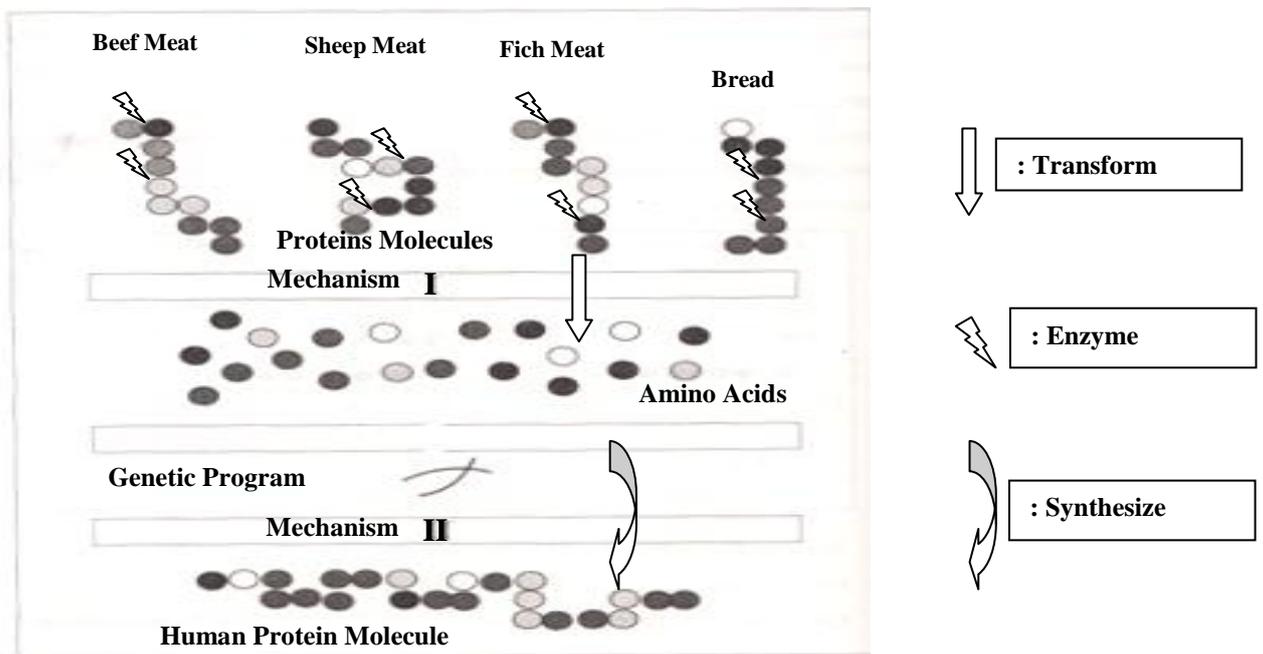
	Fehling Test	Rubbing the food on a paper	Biuret Test
Avocado	-	+	-
Kiwi	+	-	+

+: presence of the tested substance

-: absence of the tested substance

- 1- Determine the composition of each food referring to the above table.
- 2- "Kiwi is a complexe food." Indicate whether this statement is correct or not and justify.
- 3- For a person having a cardiovascular disease, which food can he consume (avocado or kiwi) without having a problem? Justify.
- 4- Water represents 80% of the mass of kiwi. Describe an experiment that allows to identify the presence of water in kiwi.

B) The following document represents proteins that constitute some food and their fate in the human organism.



- 1- Write a short text that describes the above document.
- 2- Give the scientific name of each of mechanisms I and II.
- 3- Give the name of the enzyme acting in mechanism I.
- 4- Compare the protein molecule of fish meat and that of humans.

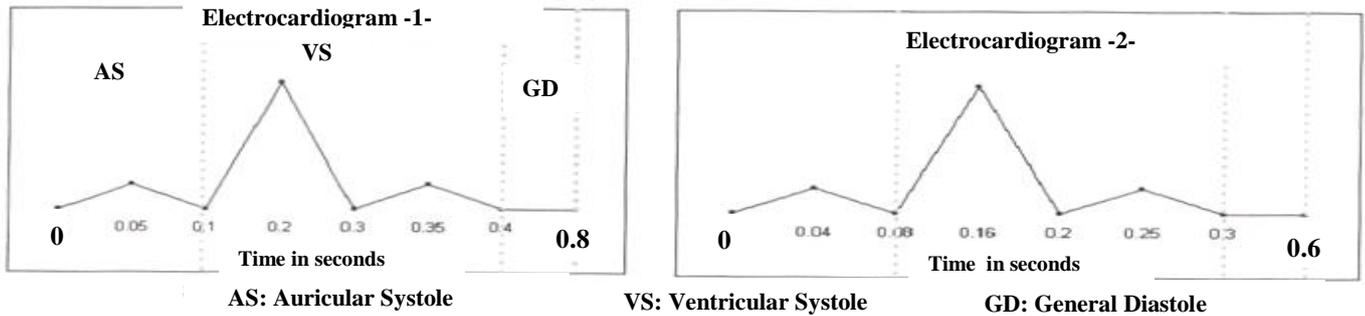
Second Exercise (8.25 points)

A) Asthma is a respiratory disease which is manifested by a difficulty in breathing. The following table represents the number of respiratory movements in a healthy person and in an asthmatic person at rest, and the diameter of the bronchioles of each one.

	Healthy Person	Asthmatic Person
Number of Respiratory Movements per Minute	18	26
Diameter of Bronchioles in Arbitrary Unit(a.u)	5	3

- 1- Write the problem that studied in this experiment.
- 2- Interpret the obtained results in the above table.

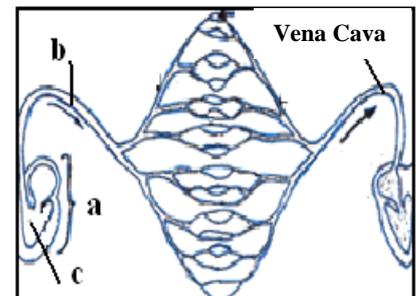
The duration of a cardiac cycle varies from a healthy person to an asthmatic person. The following documents show the electrocardiogram of a healthy person and that of an asthmatic person.



- 3- Indicate the duration of the cardiac cycle in each electrocardiogram.
- 4- Based on the knowledge, deduce the electrocardiogram that corresponding to the asthmatic person.

B) The following figure shows a part of the blood circulation:

- 1- Label a, b and c.
- 2- Give the name of this circulation and indicate its role.
- 3- Indicate during which phase of the cardiac cycle the blood passes from c to b.
- 4- Name and explain what happens during the phase that follows directly this phase and **indicate** its duration.



Third Exercise (3.25 points)

Carbon monoxide (CO) is a toxic gas that escapes from exhaust. It exists also in the smoke of tobacco. To determine the capacity of transport of oxygen gas and carbon monoxide (CO) by hemoglobin, a study is conducted on adults: Smoker, passive smoker (who does not smoke but who is in the same place with a smoker) and a non smoker. The obtained results are shown in the following table.

	Volume of O ₂ in mL/g of hemoglobin	Volume de CO in mL/100 mL of blood
Non Smoker	1.328	0.28
Passive Smoker	1.275	0.50
Smoker	1.210	2.20

- 1- Pick up, from the paragraph, a source of carbon monoxide.
- 2- Analyze the obtained results. Draw out a conclusion.
- 3- What is the effect of the transport of carbon monoxide on the color of blood?