

الاسم:

الرقم:

مسابقة في مادة علوم الحياة

المدة: ساعة واحدة

مسابقة في مادة علوم الحياة والأرض

المدة: ساعة واحدة

(انكليزي)

الاسم:

الرقم:

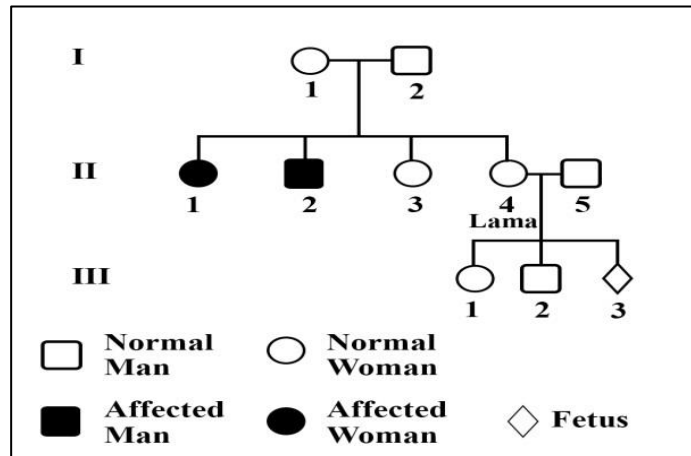
Answer the following four exercises

Exercise 1 (5 points)

Cystic Fibrosis

Cystic fibrosis is a serious genetic disease.

Document 1 represents the pedigree of a family whose certain members are affected by this disease.



Document 1

1-1. Indicate if the allele responsible for this disease is dominant or recessive.

1-2. Justify your answer.

1-3. Designate by symbols the two corresponding alleles.

2-1. Write the possible genotypes of Lama (II₄).

2-2. Justify the answer.

Document 2 represents the types and the number of alleles of the gene of Cystic fibrosis in Lama and her fetus.

	Lama II ₄	Fetus
Normal allele	1	0
Affected allele	1	2

Document 2

3. What is the real genotype of Lama? Why?

4. Is Lama's fetus phenotype affected? Why?

Exercise 2 (5 points)

The Gout

An elevated level of urea in blood provokes a disease that affects the kidneys and the joints: the Gout.

1. **Pick out** from the text the effect of the high concentration of urea in blood.

The table below represents the results of a study performed on healthy individuals to determine the origin of urea in blood.

Quantity of consumed protein (in g/Kg of Body mass)	0.5	1.5	2
Concentration of urea in plasma (in g/L)	0.20	0.40	0.45

Document 1

2. **Draw** a curve showing the variation in the concentration of urea in the plasma as a function of the quantity of consumed protein.

3-1. **Analyze** the obtained results.

3-2. what is the origin of urea in plasma

4-1. **Choose** the cause of the disease:

- A high quantity of consumed proteins
- A small quantity of consumed proteins

4-2. **Explain** your choice.

Exercise 3 (5 points)

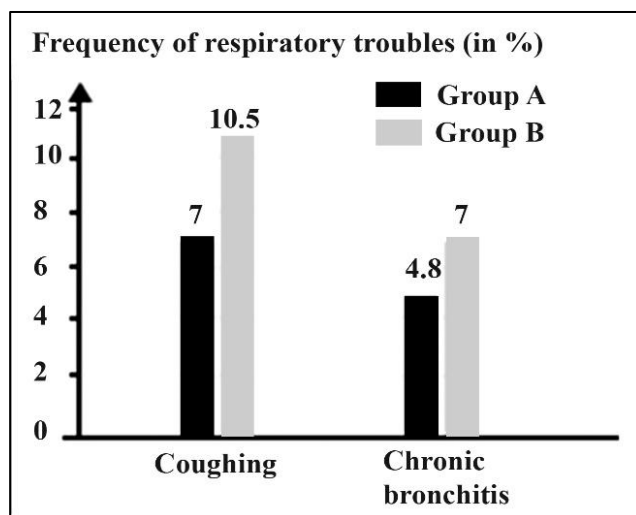
Passive smoking

Passive smoking is defined as involuntary inhalation of the cigarette smoke produced by one or more smokers found in the same area along non-smokers.

1. **Pick out**, from the text, the definition of passive smoking.

The document below represents the frequency of the respiratory troubles in two groups of non-smokers:

- Group A: Individuals not exposed to cigarette smoke.
- Group B: Individuals exposed to cigarette smoke.



2. **Recopy and complete** the table below:

	Frequency of respiratory troubles (in %)	
	Coughing	Chronic Bronchitis
A: Without smoke		
B: With smoke		

3. **Justify** the following statement:

“Inhibition of smoking in closed public areas is a major action that protects non-smokers.”

Exercise 4 (5 points)

Celiac disease

The intestinal villi increase the surface area of intestinal wall.

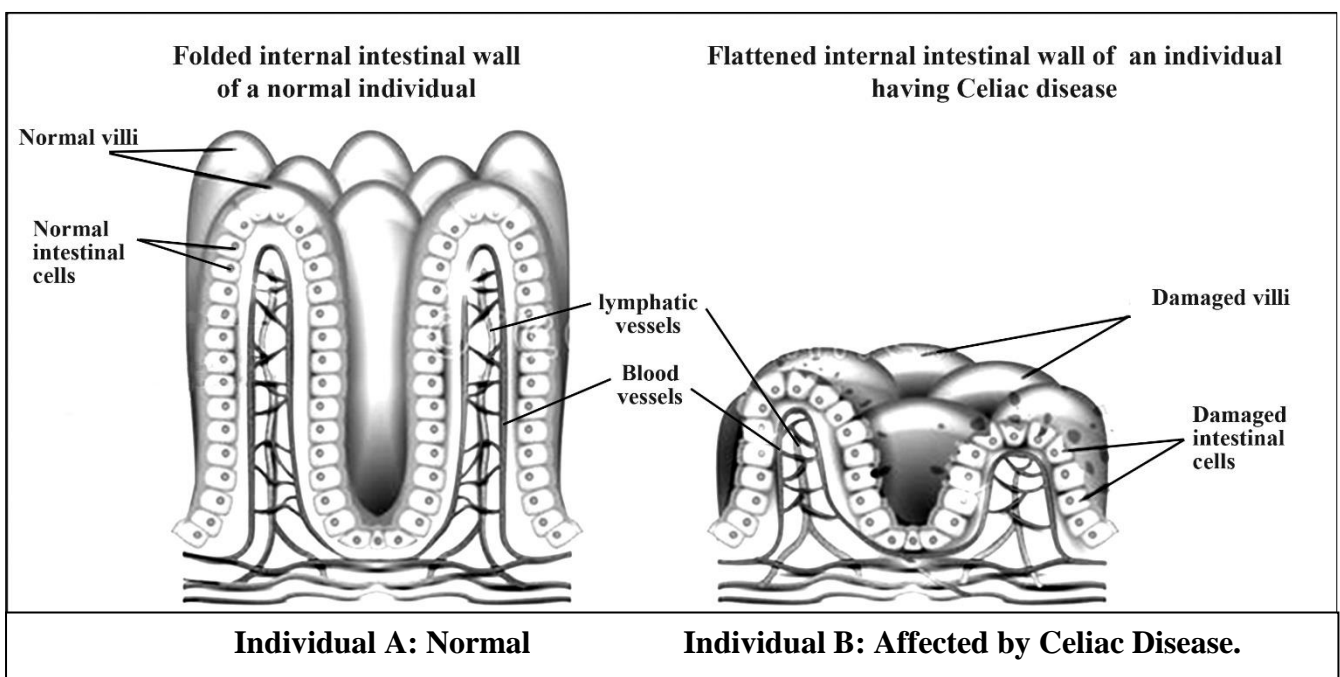
1-1. **Indicate** from the text the role of intestinal villi.

1-2. **Choose** the three characteristics of the intestinal wall.

- The size of the surface.
- The thickness of the wall.
- The thinness of the wall.
- The richness in capillaries.
- The richness in proteins.

There are individuals who are affected by a disease called “Celiac disease”. When these individuals eat food rich in gluten, they suffer from diarrhea, fatigue and anemia.

The document below represents the inner wall of the small intestine in a normal individual A and another individual B affected by celiac disease.



2-1. Recopy and complete the table by referring to the document.

	Aspect of villi	Aspect of the inner wall of the intestine	Vascularization
A: Normal individual			
B: Affected Individual			

Certain individuals affected by Celiac disease present digestive troubles due to gluten.

2-2. Choose the characteristics of the inner wall of the intestinal in the individual affected by this disease.

- Poor vascularization of the inner wall of the small intestine.
- A small surface of the inner wall of the intestine.
- A large number of intestinal cells.
- A large surface area of the inner wall of the small intestine.

This disease can slow down the growth of the infant although he consumes a balanced food diet.

3. How can Celiac disease decrease the growth in the affected infant?