

This Exam Includes Two Exercises. It is Inscribed on 2 Pages Numbered from 1 to 2.

The Use of A Non –Programmable Calculator Is Allowed.

Answer The Two Following Exercises:

First Exercise (10points)

Soya

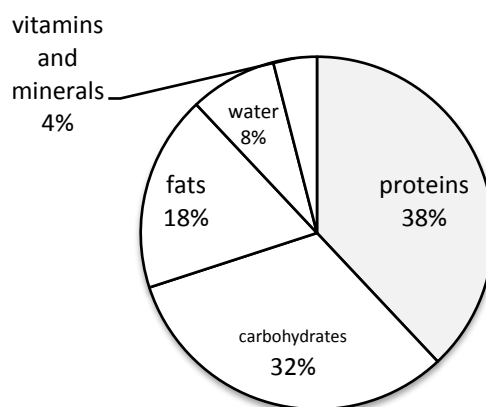
All experts agree that we should balance our intake between plant and animal proteins....

Reducing our intake of animal foods (meat, sausages, dairy products...) in favor of plant foods allows to limit our intake of saturated fats and to increase our fiber intakes as well as other micronutrients intakes (vitamins, minerals..).

Soya bean is a legume rich in vegetable proteins of high quality since they contain the eight amino acids essential to our body.

Soya bean does not contain cholesterol. It contains good fats, mostly unsaturated, including the famous Omega 3 and Omega 6 which are essential to our health.

Soyabean is lactose –free but it contains sucrose and complex carbohydrates.



Average nutrient composition of soya beans

www.sojasun.com/les-bienfaits-du-vegetal.html

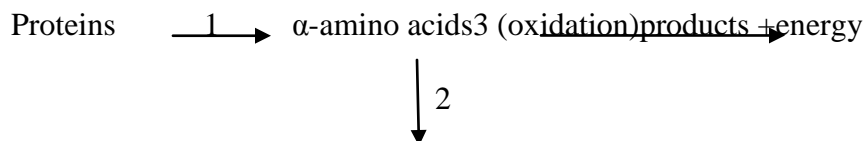
Questions:

1- Referring to the text, answer the following questions :

1.1- Specify the importance of plant foods in our diet.

1.2- Justify that people with lactose intolerance can use soya bean in their diet.

2- The digestion of proteins in the body can be represented by the following transformations:



New proteins

2.1- Write the general formula of an α -amino acid.

2.2- Pick-up from the table below the transformations that represent catabolism and the one that represents anabolism.

Transformation(s)	1	2	1 and 2	3

2.3- Name two products of the transformation 3 (oxidation).

- 3- Calculate the energy provided by the fats contained in 50 g of soya beans knowing that 1 g of fat produces 9 Kcal.
- 4- Justify the presence of hydrosoluble and liposoluble vitamins in soya beans.
- 5- Given below, the average daily requirements of the body in some minerals found in soya bean:

Mineral	Ca	Fe	Mg	Zn
Average daily requirement	800 mg	14 mg	375 mg	15 mg

- 5.1- Classify these minerals as macro minerals and trace minerals.
- 5.2- Give, for each of those minerals, one role in the human body.

Second Exercise (10 points) Meningitis

Meningitis is an inflammation of the membranes (meninges) surrounding the brain and the spinal cord. The "hallmark" signs and symptoms of this condition, including headaches, severe fever and a stiff neck... Most cases of meningitis are caused by a virus (viral meningitis). Meningitis can be also caused by bacteria (bacterial meningitis) or by fungi (fungal meningitis)

Acute bacterial meningitis requires prompt treatment with intravenous antibiotics and, more recently, cortisone medications, to ensure recovery and reduce the risk of complications. The antibiotic or combination of antibiotics that doctor may choose depends on the type of bacteria causing the infection. The doctor may recommend a broad-spectrum antibiotic until he or she can determine the exact cause of the meningitis. Antibiotics can't cure viral meningitis. Treatment of mild cases of viral meningitis usually includes: bed rest, plenty of fluids, and over-the-counter pain medications to help reduce fever and relieve body aches. (Aspirin is not recommended).

Fungal meningitis is treated with antifungal medications.....

<http://www.mayoclinic.org/>

Questions:

- 1- Referring to the text, answer the following questions:
 - 1.1- Give two symptoms of meningitis.
 - 1.2- Identify the case in which a broad-spectrum antibiotic is prescribed.
 - 1.3- Copy and complete the table below:

Type of meningitis	Cause of infection

- 2- Given the trade names of four medicinal drugs: Maalox[®], Valium[®], Panadol[®], and Penicillin G[®].
 - 2.1- Choose, among those drugs, the one that can be used in the case of viral meningitis. Justify.
 - 2.2- Indicate for each of the three other drugs the corresponding pharmaceutical class.
- 3- Cortisone medications are used to ensure recovery in the case of bacterial meningitis.
 - 3.1- Specify whether aspirin and cortisone belong to the same group of anti-inflammatory drugs.
 - 3.2- List two side effects of using cortisone.
- 4- Acute bacterial meningitis requires prompt treatment with antibiotics.
 - 4.1- Give the reason for which the use of large-spectrum antibiotic should be limited.
 - 4.2- Define resistant bacteria.
 - 4.3- List four advantages of using a combination of antibiotics.

مسابقة في الثقافة العلمية- مادة الكيمياء
المدة: ساعة واحدة

First Exercise (10points)

Soya

Questions	Answer	mark										
1.1	The plant foods are poor in saturated fats and rich in fibers and micronutrients	1										
1.2	People with lactose intolerance, can use soya in their diet since it is lactose-free food.	1										
2.1	The general formula of an α -amino acid is: $\begin{array}{c} \text{R} - \text{CH} - \text{COOH} \\ \\ \text{NH}_2 \end{array}$	1										
2.2	Catabolism is represented by: transformation 1 and transformation 3 Anabolism is represented by: transformation 2	1.5										
2.3	Two products of this reaction: water and carbon dioxide.	1										
3	The mass of fats is $18 / 2 = 9$ g The energy value is: $9 \times 9 = 81$ Kcal	1.5										
4	The presence of water in soybeans justifies the presence of hydrosoluble vitamins. The presence of lipids in soybeans justifies the presence of liposoluble vitamins.	1										
5.1	The macro minerals are: Ca and Mg (daily need >100 mg) The trace minerals are: Fe and Zn. (daily need <20 mg)	1										
5.2	<table border="1"> <thead> <tr> <th>mineral</th> <th>Role</th> </tr> </thead> <tbody> <tr> <td>Ca</td> <td>Forms and maintains both bones and teeth.</td> </tr> <tr> <td>Mg</td> <td>Is essential to normal muscular contraction. (contributes to protein synthesis)</td> </tr> <tr> <td>Fe</td> <td>Is a component of oxygen-carrying proteins.</td> </tr> <tr> <td>Zn</td> <td>Is a part of insulin.</td> </tr> </tbody> </table>	mineral	Role	Ca	Forms and maintains both bones and teeth.	Mg	Is essential to normal muscular contraction. (contributes to protein synthesis)	Fe	Is a component of oxygen-carrying proteins.	Zn	Is a part of insulin.	1
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Second Exercise (10 points)
Meningitis

Questions	Answer	mark								
1.1	The two symptoms of meningitis are: headaches, severe fever,(stiff neck)...	0.5								
1.2	A broad-spectrum antibiotic is prescribed when the exact cause of meningitis is unknown.	0.5								
1.3	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Type of meningitis</th> <th style="text-align: center;">Cause of infection</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Bacterial meningitis</td> <td style="text-align: center;">Bacterial infection</td> </tr> <tr> <td style="text-align: center;">Viral meningitis</td> <td style="text-align: center;">Viral infection</td> </tr> <tr> <td style="text-align: center;">Fungal meningitis</td> <td style="text-align: center;">Fungal infection</td> </tr> </tbody> </table>	Type of meningitis	Cause of infection	Bacterial meningitis	Bacterial infection	Viral meningitis	Viral infection	Fungal meningitis	Fungal infection	1.5
Type of meningitis	Cause of infection									
Bacterial meningitis	Bacterial infection									
Viral meningitis	Viral infection									
Fungal meningitis	Fungal infection									
2.1	Panadol is used in the case of viral meningitis since it reduces fever and relieve body aches	0.75								
2.2	Maalox [®] : anti acid ,Valium [®] : tranquilizer and Penicillin G [®] : antibiotic	0.75								
3.1	Aspirin and cortisone do not belong to the same group of anti-inflammatory drugs since the first is a non-steroidal anti-inflammatory drug and the second is a steroidal anti-inflammatory drug.	1								
3.2	Two side effects of using cortisone are: fluid retention, unwanted hair, a moon face appearance, and mental depression.	1								
4.1	The use of a large spectrum antibiotic should be limited since these antibiotics can kill some beneficial bacteria.	1								
4.2	Resistant bacteria are bacteria that can not anymore be eradicated by the antibiotic.	1								
4.3	<p>Four advantages of using a combination of antibiotics are:</p> <ul style="list-style-type: none"> - To treat mixed infection. - To obtain a more intensive effect, and to limit the side effects. - To prevent the emergence of resistant bacteria. - In case of emergence, when the invading microorganism is unknown. - (to permit the use of a lower dose of one of the antibiotics) 	2								