

الاسم:
الرقم:مسابقة في الثقافة العلمية - مادة الكيمياء
المدة: ساعة واحدة

This Exam Includes **Two Exercises**. It Is Inscribed On Two Pages Numbered **1** and **2**.
Use Of a Non-programmable Calculator Is Allowed.

Answer the Two Following Exercises:

First Exercise (10 points)
A Label of a Food Product

The information below represents the label of a food product.

<p>Little, crispy and special breads Ingredients: Cereal 92 % (wheat-flower, wheat-germs) – Vegetable fatty matter – Yeast – Sugar – Lactose and proteins of milk – Barley malt – Salt – Emulsifying agent: soya lecithin – Aroma – Peanut – Egg. Will be conserved in a dry and fresh place. Will be preferably consumed the date that indicated on the side of the box. Net weight: 475 g</p>	Average nutritional value for 100 g	
	Energetic value: 415 kcal – ... kJ.	
	Proteins	10.0 g
	Carbohydrates.....	70.0 g
 sugar	6.4 g
 starch	63.6 g
	Lipids	10.0 g
 Saturated.....	4.7 g
	Food fibres.....	4.3 g
	Sodium.....	0.36 g

Given: Energy value for 1 g of nutrient:

- Carbohydrates: 17 kJ ;
- Lipids: 38 kJ ;
- Proteins: 17 kJ;
- Fibers: 0 kJ;
- Sodium: 0 kJ.

Questions:

- 1- Give the name of the mineral and the names of the organic nutrients involved in the composition of this food.
- 2- Indicate the difference in structure between the saturated and unsaturated lipids.
- 3- The label includes two food additives: emulsifying agent and aroma.
 - a) Specify the role of an emulsifying agent.
 - b) Give two other food additives and specify the role of each.
- 4- Determine the mass of unsaturated lipids in 100 g of this food. Deduce the percent mass composition of saturated and unsaturated lipids in this food.
- 5- Calculate, in kJ, the energy value of 100 g of this food. Deduce, in Joule, the equivalent value of a calorie.

Second Exercise (10 points)
The Industrial Face of Chemistry

" ... Chemistry is a base of an industrial and commercial activity which is fundamental for the development of a country, ...

Natural Resources

Nothing can be manufactured from nothing. Chemistry does not know create the matter but transforms it...Therefore, chemistry needs raw materials which constitute starting points for chemistry activities.

A Structured Activity

Industrial activities take up an intermediate position between the natural resources of raw materials and their utilizations. Heavy chemistry industry elaborates compounds which are not present in the nature and have often no direct applications. Starting from these compounds, specific, acute ... and pharmaceutical chemical industries prepare commercial products for users and consumers.

A Considerable Economic Weight

Commercial, industrial and economic activity associated with all forms of chemistry is one of the most important activities in the world...

The annual business turn-over of each one of the most five important firms in this domain is 20 to 25 US billion dollars ...

An Industry within an Industry

..., the chemical industry provides an essential contribution to the development of other sectors of economy... This industry is linked ...to the sectors that provide the principal raw materials (oil products and natural gas, mines, agricultural products, electricity). This industry is also linked to other industries (paper, carton, glass...) and to service activities (transport, insurances, telecommunications...)."

Translate from: PAUL ARNAUD, Si la chimie m'était contée, Belin. Paul la science, 2002.

Questions:

- 1- State three organic and three inorganic industries in Lebanon.
- 2- " Nothing can be manufactured from nothing. Chemistry does not know create the matter but transforms it...Therefore, chemistry needs raw materials which constitute starting points for chemistry activities. "
To justify the above statement, choose choosing a chemical industry in Lebanon that uses local raw materials and another chemical industry that imports its raw materials.
- 3- The annual business turn-over of each one of the most five important firms exceeds 20 US billion dollars. This turn-over may be, partially, justified by a feasible study that should be done before the installation of any industry.
State two points that must be included in this study.
- 4- The development of some sectors of the economy is linked to the chemical industry. Justify this fact by referring to the above passage.
- 5- The impact of chemical industry on the environment is enormous.
State two pollutants that result from the chemical industry in Lebanon. Specify the industry that provides each pollutant.