


<p>المادة: الكيمياء – اللغة الإنكليزية  الشهادة: الثانوية العامة  الفرع: الإجتماع والإقتصاد - الآداب والإنسانيات  نموذج رقم: 2 / 2019  المدة: ساعة واحدة</p>	<p>الهيئة الأكاديمية المشتركة  قسم: العلوم</p>	 <p>المركز التربوي  للبحوث والإنماء</p>
--	--	--

**This Exam Is Composed of Two Exercises. It Is Inscribed on Two Pages, Numbered 1 and 2. Answer The Two Following Exercises:**

### Rice Syrup

#### Exercise 1 (10 points)

Cereal syrups such as barley malt are obtained from the brewing of malt (sprouted cereal).

By an enzymatic work at controlled temperature, this malt releases the maltose, slow sugar which is the main constituent of these syrups.

Malt and cereal syrups are good natural sweeteners obtained from starch. They can successfully replace cane sugar in hot drinks, desserts and pastries. They are well suited for molded pasta as soon as cakes, madeleines, sponge cakes, biscuits...

The rice syrup has a rather pronounced flavor with a slight taste of honey and will be perfect to replace sugar sucrose in your pastry recipes not only for sponge cake, biscuits, pancakes, waffles, cakes but also to sweeten your hot drinks, herbal teas ...

Rice syrup is a good source of energy during physical and mental activities. It also provides minerals and is therefore nutritionally preferable to cane and beet sugars from advanced refining.

<b>Energetic value : 1314 kJ</b>	
<b>Fat</b>	0.4 g
<b>Carbohydrates</b>	80 g
<b>Protein</b>	1.1 g
<b>Sodium chloride</b>	0.11 g
<b>Potassium</b>	84 mg
<b>Magnesium</b>	30 mg
<b>Document-1</b>	

**Document-1** represents the average nutritional value corresponding to 100 g of rice syrup.

**Given:** 1 g of carbohydrate provides 16 kJ;  
1 g of lipids provides 38 kJ;  
1 g of protein provides 17 kJ.

#### Questions:

- Referring to the text and document -1, answer the following questions:
  - Pick out all carbohydrates.
  - Classify these carbohydrates into monosaccharides, disaccharides and polysaccharides.
  - Name three minerals present in the rice syrup.
  - Explain how to prepare cereal syrups.
- Give the names of the chemical elements constituting carbohydrates.
- Write the word equation of the synthesis reaction of sucrose.
- The rice syrup contains a small amount of fat; it is rich in fat soluble vitamins.
  - Name the other class of vitamins and distinguish soluble vitamins.
  - Is excessive consumption of fat-soluble vitamins toxic to our body? Justify.
  - Compare the molecular structure of a saturated fatty acid and an unsaturated fatty acid.
- Verify, referring to document-1, the energy value corresponding to 100 g of rice syrup.
- Lactose is the sugar of milk. Soya milk has almost identical qualities to cow's milk, with one difference: vegetable milk contains neither calcium nor lactose. For some children, digestion and absorption of milk sugar is a problem.
  - Name this problem.
  - State two of its symptoms.

## Exercise 2 (10 points)

## Function of Medicinal Drugs

Proteins are little molecular machines that perform most of the necessary actions to keep a cell alive. These machines are too small to be seen, one might therefore believe that it is impossible to influence their operation. The drugs are small molecules that bind to proteins and alter their function. Some highly effective drugs like antibiotics or anticancer drugs are used to completely disable some dangerous molecular machines. These drugs can kill bacteria or cancer.

Other molecules, such as aspirin, slightly block some proteins for a few hours. By using these drugs, we can modify the inside of our cells and thus block the pain signals.

Some drugs, such as penicillin, have been discovered in nature. Other drugs such as HIV protease inhibitors have been created by studying the target structure on the protein to design new active molecules.

Pharmacists have developed many medications that help people change their organic function. The drug Orlistat (Xenical) blocks the action of pancreatic lipase and reduces the amount of fat absorbed during feeding. Atorvastatin (Lipitor) and simvastatin (Zocor) lower cholesterol levels by blocking the action of HMG-CoA reductase, an enzyme involved in cholesterol synthesis. These medications can be used in addition to a diet and exercise to help lose weight and regulate cholesterol levels, and control heart disease.

### Questions


- Referring to the text, answer the following questions:
  - Indicate the effects of antibiotics and aspirin on the molecular machinery (proteins).
  - Give the names of drugs that can help to lose weight and regulate cholesterol levels.
  - Penicillin is not a synthetic drug. Justify.
- The antibiotic is one of the most common drugs.
  - Define an antibiotic.
  - Indicate the two ways used to obtain an antibiotic.
  - Antibiotics are classified according to the targeted microorganisms. Give the corresponding two classes of antibiotics.
  - Distinguish the case of the prescription of a broad spectrum antibiotic from the narrow spectrum one.
- Aspirin and acetaminophen are the generic names of two common drugs. Copy and complete the table in the following document -1:

Generic Name	Brand Name	Pharmaceutical effect
Aspirin	.....	..... ..... .....
Paracetamol	.....	..... .....
<b>Document-1</b>		

4. Corticosteroids are anti-inflammatory drugs. List two effects of their overdose.

5. Match the items in column I to those of column II:

- | Column I                 | Column II  |
|--------------------------|--|
| a- An antacid            | i- is responsible for the therapeutic effect of a drug                                     |
| b- An anti-inflammatory  | ii- is a drug that relieves acute depression states.                                       |
| c- The active ingredient | iii- a basic compound is administered to neutralize stomach acids                          |
| d- An anesthetic         | iv- is a substance to fight against inflammation.  |
|                          | v- is a substance that causes local or general loss of sensation, including pain sensation |

المادة: الكيمياء – اللغة الإنكليزية الشهادة: الثانوية العامة الفرع: الإجتماع والإقتصاد - الآداب والإنسانيات نموذج رقم: 2 / 2019 المدة: ساعة واحدة	الهيئة الأكاديمية المشتركة قسم: العلوم	 المركز التربوي للبحوث والإنماء
---	---	--

أسس التصحيح

Part of question	Exercise 1 (10 points)      Rice Syrup	Mark
<b>Expected Answers</b>		
1.1.	Carbohydrates mentioned in the text are: starch, maltose and sucrose.	3/4
1.2.	Starch: polysaccharide. Maltose and sucrose: disaccharide.	1/4 1/2
1.3.	Potassium, magnesium and sodium.	3/4
1.4.	Cereal syrups such as barley malt are obtained from the brewing of malt (sprouted cereal). By an enzymatic work at controlled temperature, this malt releases the maltose, slow sugar which is the main constituent of these syrups.	1
2.	The chemical elements constituting the carbohydrate are: carbon, hydrogen and oxygen.	3/4
3.	<b>Glucose + Fructose → Sucrose + Water.</b>	3/4
4.1.	The other class of vitamins is hydro-soluble vitamins. These vitamins are soluble in water.	1/4 1/4
4.2.	Consumption of excessive amounts of fat soluble vitamins usually leads to toxic reactions because fat-soluble vitamins are dissolved and stored in adipose tissue.	3/4
4.3.	The carboxyl functional group is common. The saturated fatty acid has a saturated carbon chain; the unsaturated fatty acid has one or more than one double bond in its carbon chain.	1/2 1/2 1/2
5.	The energy value = $(0.4 \times 38) + (80 \times 16) + (1.1 \times 18) = 1313.9 \text{ K j}$ ; verified	1
6.1.	This problem is lactose intolerance.	1/2
6.2.	Two symptoms of lactose intolerance: nausea and diarrhea.	1

Part of question	Exercise 2 (10 points):      Function of Medicinal Drugs	Mark
<b>Expected Answers</b>		
1.1.	Antibiotics or anticancers are used to completely disable certain dangerous molecular machines. Other molecules, such as aspirin, slightly block certain proteins for several hours.	1/2 1/2
1.2.	Atorvastatine (Lipitor) and Simvastatine (Zocor) lower cholesterol levels	1/2
1.3.	Penicillin is a natural drug for it is discovered in nature	1/2
2.1.	An antibiotic is a substance used for killing or inhibiting the growth of microorganisms.	3/4
2.2.	An antibiotic is obtainable by microbiological culture or by synthesis.	1/2
2.3.	Antibiotics are classified according to the target microorganisms in bactericidal and fungicidal.	1
2.4.	Doctors prescribe a narrow-spectrum antibiotic when the microorganism is identified and prescribe a broad-spectrum antibiotic when the microorganism is not known.	1

	Generic Name	Brand Name	Pharmaceutical effect	
3.	Aspirin	Aspirin	- Analgesic - Antipyretic - Anti-inflammatory	1 ¾
	Paracetamol	Panadol	- Analgesic - Antipyretic	
	<b>Overdose effects:</b> 1. Weight gain and obesity. 2. Hypertension. Or others as: 3. Atrophy of muscles. 4. Muscular paralysis due to potassium deficiency in the blood (hypokalemia). 5. Increased glucose levels in the blood.			
5.	a- An antacid → iii- is a basic compound, administered to neutralize stomach acids.			½
	b- An anti-inflammatory → iv- is a substance to fight against inflammation.			½
	c- The active ingredient → i- is responsible for the therapeutic effect of a drug.			½
	d- An anesthetic → v- is a substance that causes local or general loss of sensation, including pain sensation.			½