

اسم: \_\_\_\_\_  
رقم: \_\_\_\_\_  
مسابقة في الثقافة العلمية : مادة الكيمياء  
المدة: ساعة واحدة

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:

### Exercise 1 (10 points)

### Frosties “Sugar Frosted Flakes of Corn”

A food product found in the Lebanese market where the ingredients are: corn, sugar, salt and barley malt flavoring. The label on a box of this product shows among others the indications presented in document-1

#### Given:

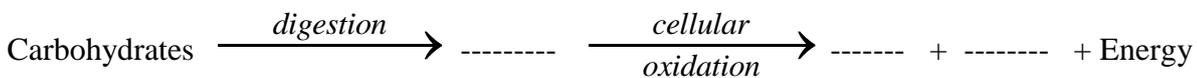
- 1 g of proteins provides 4 Kcal;
- 1 g of carbohydrates provides 4 Kcal;
- 1 g of lipids provides 9 Kcal.

Nutritional Facts per 100 g	
Energy value: 375Kcal	
Fat	0.6 g
Carbohydrate	88 g
Fiber	2 g
Protein	4.5 g
Vitamin D	4.2 µg
Vitamin B <sub>12</sub>	2.1 µg
Vitamin B <sub>1</sub>	0.91 µg
Calcium	456 mg
Iron	8 mg

Document-1

### Questions

- List the five types of nutrients needed for a balanced diet.
- Pick out, from the text, one food additive.
- Corn flakes are important source of fiber. Indicate the importance of fiber in the human diet.
- Vitamins are classified into hydrosoluble and liposoluble.
  - 4.1. Give the meaning of each term.
  - 4.2. Indicate the class of each vitamin mentioned in document-1.
- For an adult, the daily need of calcium is 900 mg and that of iron is 18 mg. Classify these two minerals into trace-mineral and macro-mineral.
- Fats and oils are simple lipids that are derived from saturated and unsaturated fatty acids respectively. Choose the correct answer:  
The covalent bonds between the carbon atoms, in a molecule of saturated fatty acids are:
  - double covalent bonds.
  - simple and double covalent bonds.
  - simple covalent bonds.
- The high energy value of “Sugar frosted Flakes of Corn” is mainly due to its high content in carbohydrates. Recopy and complete the following schematic representation:



- Verify the energy value provided by 100g of the above “Sugar frosted Flakes of Corn”.

**Exercise 2 (10 points)****Augmentin® 625mg**

Antibiotics are medicinal drugs used to kill or inhibit the growth of bacteria and fungi. They are chemicals produced by microbiological culture or by chemical synthesis.

The treatment by an antibiotic is very delicate, once antibiotic treatment is started it is recommended that patients continue antibiotic therapy as prescribed. Interruption of the treatment favors the development of bacteria resistance.

Augmentin® 625mg is an antibiotic containing principally two active ingredients: amoxicillin and clavulanic acid. This medicinal drug doesn't have any effect on viral infections as flu (common cold).

Augmentin® is used to treat the following infections:

Middle-ear infection, sinus infection, urinary tract infection, bone infection and joint infection.

Augmentin® has many side effects: it provokes stomach upset and diarrhea...

This drug should be stored out of reach of children and conserved at a temperature below 25°C.

**Questions**

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

- 1.1. List two ways to prepare an antibiotic.
- 1.2. Name the active ingredients of Augmentin®.
- 1.3. Give two infections treated by Augmentin®.
- 1.4. Specify whether it is advisable to treat an adult suffering flu (common cold) with Augmentine®.

2. State whether each statement is true or false:

- 2.1. A resistant bacterium can be killed by all types of antibiotics.
- 2.2. Diarrhea is a side effect caused when intestinal floras are disturbed by the antibiotic.

3. Augmentin® is a medicinal drug formulated into tablets. List two other formulations of medicinal drugs.

4. Antibiotics are classified into narrow spectrum antibiotics and broad spectrum antibiotics.

Indicate the case for which a physician prescribes a narrow spectrum antibiotic and the case for which a physician prescribes a broad spectrum antibiotic.

5. Flu (common cold) is sometimes accompanied with fever.

5.1. Choose, from document-1, the medicinal drug that is convenient to eliminate the fever. Justify.

<b>Medicinal drug</b>	Aspirin®	Maalox®	Valium®
<b>Pharmaceutical effect</b>	Anti-pyretic	Anti-acid	Tranquilizer

**Document-1**

5.2. In which case each of the other two medicinal drugs in document-1 is prescribed?

## Exercise 1 (10 points)

## Frosties “Sugar Frosted Flakes of Corn”

Part of the Q	Answer	Mark
1.	The five nutrients are : Carbohydrates-Lipids- Proteins-Vitamins -Minerals	1.25
2.	The food additive present in the text is :malt barely flavoring	0.5
3.	The importance of fiber in the human diet : -Facilitates the digestion -Prevents constipation -Prevents colon cancer	0.5
4.1.	Hydrosoluble : soluble in water Liposoluble : soluble in lipids	1
4.2.	The hydrosoluble vitamins are: vitamins B <sub>1</sub> and B <sub>12</sub> . The liposoluble vitamin is : Vitamin D.	0.75
5.	Calcium is a macromineral because its daily need =900 mg which is greater than 100 mg Iron is a trace mineral because its daily need =18 mg which is less than 20mg	2
6.	c- simple covalent bonds	0.5
7.	Carbohydrates $\xrightarrow{\text{digestion}}$ monosaccharide $\xrightarrow{\text{cellular oxidation}}$ CO <sub>2</sub> +H <sub>2</sub> O+ Energy	1.5
8.	E = (0.6 x 9) + (88 x 4) + (4.5 x 4) = 375.4 Kcal The energy value provided by 100g is verified.	2

**Exercise 2 (10 points)****Augmentin<sup>®</sup> 625mg**

<b>Part of the Q</b>	<b>Answer</b>	<b>Mark</b>
<b>1.1.</b>	The two ways to prepare an antibiotic: microbiological culture Chemical synthesis.	<b>1</b>
<b>1.2.</b>	the active ingredients of Augmentin <sup>®</sup> are: Amoxicillin and clavulanic acid.	<b>1</b>
<b>1.3.</b>	Middle-ear infection, sinus infection, urinary tract infection, Bone infection and joint infection.	<b>1</b>
<b>1.4.</b>	It is not advisable to treat an adult suffering flu (common cold) with Augmentine <sup>®</sup> since it's a viral infection.	<b>1</b>
<b>2.1.</b>	False	<b>0.5</b>
<b>2.2.</b>	True	<b>0.5</b>
<b>3.</b>	Liquid, suppository, spray, capsule, cream, ...	<b>1</b>
<b>4.</b>	Physician prescribes a narrow spectrum antibiotic when the invading microorganism is identified. Physician prescribes a broad spectrum antibiotic when the invading microorganism is unknown.	<b>1.5</b>
<b>5.1.</b>	Aspirin is the convenient medicinal drugs since it is an anti-pyretic used to reduce fever.	<b>1</b>
<b>5.2.</b>	Maalox used to treat the problems caused by excessive gastric acid. Valium used to relieve anxiety, excitement, and restlessness	<b>1.5</b>