

**This Exam Includes Two Exercises .It Is Inscribed on Two Pages numbered 1 and 2.
The Use of a Non-Programmable Calculator is Allowed.
Answer The Following Two Exercises:**

Exercise 1(10 points)

Ketogenic Diet

A healthy ketogenic diet should consist of about 70% fat, 25-30% protein and no more than 5% of carbohydrates per day.

Your cells normally use glucose, as their main source of fuel. However, most of your cells can also use other fuel sources, including fatty acids and ketones.

When your carbohydrates intake is very low, glycogen stores are reduced and levels of the hormone insulin decline. This allows fatty acids to be released from fat stores in your body. These acids are converted into ketones in the liver. If ketone production is high, ketones can build up in the blood causing ketosis.

Each individual will potentially have a different carbohydrates intake limit to achieve and maintain ketosis, depending on the total number of calories they eat and their daily activity levels. Generally, an intake of 5–10% of total calories from carbohydrates will produce ketosis which is advised for people who want to promote weight loss, control their blood sugar levels, or reduce their heart disease risk factors.

Eating fish such as salmon is advised for a ketogenic diet.

Document-1 shows the nutrition facts of 85g of cooked salmon

the nutrition facts of 85g of cooked salmon	
	10.5 g of fat
	18.79 g of protein
	0 g of carbohydrate

Document-1

Given: 1g of carbohydrates provides 4 kcal; 1g of protein provides 4 kcal; 1g of fat provides 9 kcal.

Questions:

- Referring to the text , answer the following questions :
 - Name the carbohydrates present in human body.
 - Specify why eating salmon can help achieve ketosis.
 - List three advantages for a ketogenic diet.
- Distinguish, based on their structure, between a saturated fatty acid and unsaturated fatty acid.
- Indicate the three main functions of lipids in the organism.
- Glycogen is an energetic nutrient.
 - Copy and complete the following schematic representation:

Glycogen $\xrightarrow{\text{digestion}}$ $\xrightarrow{\text{Cellular Oxidation}}$ + + energy

- Specify whether this pathway is an anabolism or catabolism pathway.
- Determine the energy value of 100g of cooked salmon.

Exercise 2 (10 points)

Aspirin® is dangerous or not?

The Bayer Company released a molecule, acetylsalicylic acid, in 1899 and gave it the name Aspirin®. The many properties of Aspirin® make it one of the most widely consumed drugs in the world. It is an antipyretic, analgesic and anti-inflammatory in high doses. It also has "anticoagulant" properties: in other words, it thins the blood.

A scientific research studies the link between taking Aspirin® (medicinal drug with anticoagulant properties) and micro-bleeding in the brain for elderly. This study shows that anticoagulants and cerebral micro-bleeding are "linked".

Aspirin® competes with Paracetamol®. This later is an analgesic and fever reducer, but has no gastric effects. On the other hand, Paracetamol® has irreversible harmful effects on the liver at very high doses.

Nowadays, self-medication by Aspirin®, by its effects on the stomach and on the blood, makes it a drug that requires delicate and precise handling. It is replaced by Paracetamol® if it is to fight against mild or moderate pain. On the other hand, Aspirin® remains very useful for the prevention of cardiovascular risks within the limit of 84 mg per day.

https://www.lexpress.fr/actualite/societe/sante/l-aspirine-peut-elle-etre-dangereuse_754281.html

Questions:

- Referring to the text , answer the following questions :
 - 1.1. What is the therapeutic class of Aspirin®?
 - 1.2. Name another drug that belongs to the same class of Aspirin®.
 - 1.3. List two therapeutic effects of Aspirin®.
- A medicinal drug is generally made up of two types of ingredients. Name these two types and give the role of each one.
- Aspirin® exists in tablet form. Give three other formulations of medicinal drugs.
- Answer by "true" or "false" :
 - 4.1. Aspirin® is recommended for people with cardiovascular disease.
 - 4.2. Aspirin® is prescribed for a person with an ulcer.
- Match each analgesic in column (A) to the corresponding therapeutic effect in column (B).

Column A

- a- Anti -rheumatics
- b- Antipyretics
- c- Narcotics

Column B

- i- Reduce fever
- ii- Reduce severe pain
- iii Reduce inflammation of the muscles

- Antibiotics are another class of medicinal drugs.
 - 6.1. Define an antibiotic.
 - 6.2. Antibiotics are classified as broad spectrum antibiotic and narrow spectrum antibiotic. Indicate the case in which the broad spectrum antibiotic is prescribed.

أسس تصحيح مادة الكيمياء

Exercise 1(10 points)

Ketogenic Diet

Part of Q	Answer	Mark
1.1.	The carbohydrates present in human body: glucose and glycogen	1
1.2.	Salmon is rich in fat and protein and does not contain carbohydrate so eating salmon can help achieve ketosis.	1
1.3.	The three advantages for a ketogenic diet : - promote weight loss - control their blood sugar levels - reduce their heart disease risk factors.	1.5
2.	In a saturated fatty acid all the carbon –carbon bonds are single covalent bonds (C-C). While in unsaturated fatty acid there is at least one double covalent bond between two carbon atoms in the hydrocarbon chain (C=C).	1
3	The three main functions of lipids in the organism: -Source of energy in the human body -Constitute the main components of cell membrane. - Play a biological role in chemical synthesis within the human body.	1.5
4.1	Glycogen $\xrightarrow{\text{digestion}}$ glucose $\xrightarrow{\text{Cellular Oxidation}}$ water+carbon dioxide+ energy	1.25
4.2	Catabolism, since large molecules are broken down into smaller ones associated with the release of energy.	1
5.	The energy value of 85 of cooked salmon = (18.79 x 4) + (10.5 x 9) = 169.66 Kcal The energy value of 100 of cooked salmon = 169.66 x 100/85 = 199.6 Kcal	1.75

Exercise 2 (10 points)**Aspirin® is dangerous or not?**

Part of Q	Answer	Mark
1.1.	The therapeutic class of Aspirin® : Analgesic	0.5
1.2.	Paracetamol®.	0.5
1.3.	Two therapeutic effects of Aspirin: antipyretic and anti-inflammatory.	1
2.	The two types of ingredients: - Active ingredient: responsible for the pharmaceutical action of the drugs. - Inert ingredient: drug additives that contribute to the tablet size, shape, flavor, and the appearance.	2
3.	Three other formulations of medicinal drugs: Capsules, liquid, sprays, ointments, suppositories...	1.5
4.1.	True	0.5
4.2.	False	0.5
5.	a. iii b. i c. ii	1.5
6.1.	Antibiotics are chemicals produced by one microorganism (natural antibiotics), or by chemical synthesis to kill or inhibit the growth of other microorganisms.	1
6.2.	The broad spectrum antibiotic is prescribed when the invading microorganism is unknown.	1