

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.
The Use of a Non-programmable Calculator Is Allowed.**

Answer the Following Two Exercises:

Exercise 1 (10 points)

Antibiotics

The misuse of antibiotics induces often to an over consumption that leads to harmful effects on the health .This class of medicinal drugs, very effective against the microorganisms and the bacteria, is inactive against all kind of viruses. Even though the prescription of Augmentin[®] to treat throat infections, this medicinal drug does not have any effect on viral infections like rum or the rhinopharyngitis.

Moreover, every treatment with antibiotics should not be stopped even though the patient feels well and he/she has the impression to be recovered. This may develop and may accelerate the resistance of bacteria.

Antibiotics are accused to be responsible for the sensation of fatigue, but this is a myth! In fact, this fatigue is due to the huge energy consumption by the organism, to defend and to fight against the infections, that makes the patient very exhausted...

www.bloc.com/santé-médicaments

Questions:

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

1.1. Why the duration of treatment by an antibiotic should be respected?

1.2. Specify whether Augmentin[®] is effective against any type of infection.

1.3. Pick out the cause of the sensation of fatigue during the consumption of antibiotics.

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

2.1. Distinguish between broad spectrum antibiotics and narrow spectrum antibiotics.

2.2. Indicate in which case a broad spectrum antibiotic is prescribed.

2.3. Give one undesirable effect of the extended treatment by a broad spectrum antibiotics.

3. In case of a severe bacterial infection, a treatment by the three following medicinal drugs, Amoxicilin[®], Advil[®] and antipyretic like Panadol[®] is sometimes recommended.

3.1. Define an antipyretic.

3.2. Copy and complete the following table:

	Class of the medicinal drug
Advil [®]	
Panadol [®]	
Amoxicilin [®]	

3.3. Cortisone[®] belongs to the same class of medicinal drug that of Advil[®]. Choose the correct answer.

Among the side effects of Cortisone[®]:

a. Fluid retention, unwanted hair, depression.

b. Hypokalemia, obesity, hypertension.

4. A new study in Lebanon shows an increase in the consumption of tranquilizers and anti-depressants.

Match each item in column A to its corresponding item in column B

Column A

- a. Anxiety
- b. Continuous sadness , loss of interest
- c. Excitement
- d. Restlessness
- e. Crying spells

Column B

- i. Anti-depressants
- ii. Tranquilizers

Exercise 2 (10 points)

Weight Loss

To function normally, the body needs a steady supply of energy. Some of this energy must come from glucose, which is needed to fuel the brain. Between meals, the breakdown of glycogen provides glucose and the breakdown of stored fat meets other energy needs. However, if energy stores are not refilled then the body weight will decrease.

If no food is eaten for more than several hours, glycogen stores can provide glucose. Since these stores are limited, so glucose is also supplied by the breakdown of small amounts of body protein to yield amino acids, which then can be used to make glucose via gluconeogenesis....

Because protein is not stored in the body, the breakdown of protein to provide energy and glucose results in the loss of functional body proteins.

A loss of more 30% of the functional body's proteins reduces the strength of the muscles required for breathing and heart function, depresses immune function and causes a general loss of organ function.

Nutrition Science and Application

Nutrition Facts of Broccoli Serving Size: one cup (91 g)		
Energy value: 28 Kcal		
Fat 0 g		
Carbohydrates 6 g		
-Dietary fiber 2 g		
-Sugars 4 g		
Protein 3 g		
	% Daily value	
Calcium	43 mg	100 %
Vitamin K	92 µg	100 %
Vitamin C	81 mg	100 %

Energy value per 1g	
Carbohydrates	4 Kcal
Fats	9 Kcal
Protein	4 Kcal

Document -1

Questions:

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

1.1. Indicate the two sources of energy between meals.

1.2. Copy and complete the following word equation:



1.3. Pick out the effects of the loss of the functional body's protein.

2. Name the chemical elements that constitute the nutrient considered as brain fuel.

3. For most people, about 60% to 70% of the body's total energy expenditure is used for basal metabolism.

3.1. Define basal metabolism.

3.2. List three factors that affect the basal metabolism.

4. <<The breakdown of protein to provide energy and glucose results in the loss of functional body proteins.>>

Choose, from the following terms, the one that is not a functional role of protein:

- a. Enzymatic activity b. Defense c. Anti-oxidant d. Regulatory

5. In order to promote weight loss, diet must be low in energy. Broccoli, low in calories, supplies loads of nutrients. Referring to **Document -1**.

5.1. Verify the energy value in one cup of broccoli.

5.2. Justify the recommendation: <<You should incorporate more broccoli into your diet.>>

5.3. Pick out the nutrient that lowers the risk of constipation.

Exercise 1 (10 points)

Antibiotics

Part of the Q.	Answer	Mark								
1.1	Duration of treatment by an antibiotic should be respected in order to prevent the development or acceleration the resistance of bacteria.	1								
1.2	Augmentin is an antibiotic which is effective against bacterial infection but has no effect on viral infection.	1								
1.3	This fatigue is due to the huge energy consumption by the organism to defend and to fight against the infections that makes the patient very exhausted.	1								
2.1	Broad spectrum antibiotics are effective against a wide variety of microorganisms. Narrow spectrum antibiotics are effective against a specific microorganism.	1								
2.2	Broad spectrum antibiotics are prescribed when the invading microorganism is unknown.	0.75								
2.3	They might kill some beneficial bacteria such as intestinal floras.	1.5								
3.1	Antipyretics are analgesics which are used to lower or eliminate fever.	0.75								
3.2	<table border="1"> <thead> <tr> <th></th> <th>Class of the medicinal drug</th> </tr> </thead> <tbody> <tr> <td>Advil®</td> <td>Anti-inflammatory</td> </tr> <tr> <td>Panadol®</td> <td>Analgesic</td> </tr> <tr> <td>Amoxicilin®</td> <td>Antibiotic</td> </tr> </tbody> </table>		Class of the medicinal drug	Advil®	Anti-inflammatory	Panadol®	Analgesic	Amoxicilin®	Antibiotic	1
	Class of the medicinal drug									
Advil®	Anti-inflammatory									
Panadol®	Analgesic									
Amoxicilin®	Antibiotic									
3.3	a. Fluid retention, unwanted hair, depression.	0.75								
4	a - ii ; b - i ; c - ii ; d - ii ; e - i	1.25								

Exercise 2 (10 points)

Weight Loss

Part of the Q.	Answer	Mark
1.1	-The breakdown of glycogen provides glucose - The breakdown of stored fat meets other energy needs.	1
1.2	Protein $\xrightarrow{\text{break down}}$ amino acids $\xrightarrow{\text{Gluconeogenesis}}$ glucose	1
1.3	The loss of functional body's proteins reduces the strength of the muscles required for breathing and heart function, depresses immune function and causes a general loss of organ function.	1
2	Glucose is the nutrient that can be considered as brain fuel, the chemical elements are carbon, hydrogen and oxygen.	1
3.1	Basal metabolism is the basic metabolic process which keeps the body alive.	0.75
3.2	Age, body size, activity of thyroid gland and the thermogenic effect of food.	0.75
4	c. Anti-oxidant	0.75
5.1	$\text{Energy value} = E_{\text{protein}} + E_{\text{carbohydrate}} + E_{\text{lipids}} = (3 \times 4) + (4 \times 4) + (0 \times 9)$ $= 12 + 16 = 28 \text{ kcal}$	2
5.2	It is recommended to include more broccoli into your diet because of its low calories content and supply loads of nutrients and ensures 100% daily value of calcium, Vitamin k and vitamin C	1
5.3	Fiber	0.75