

Answer the following exercises

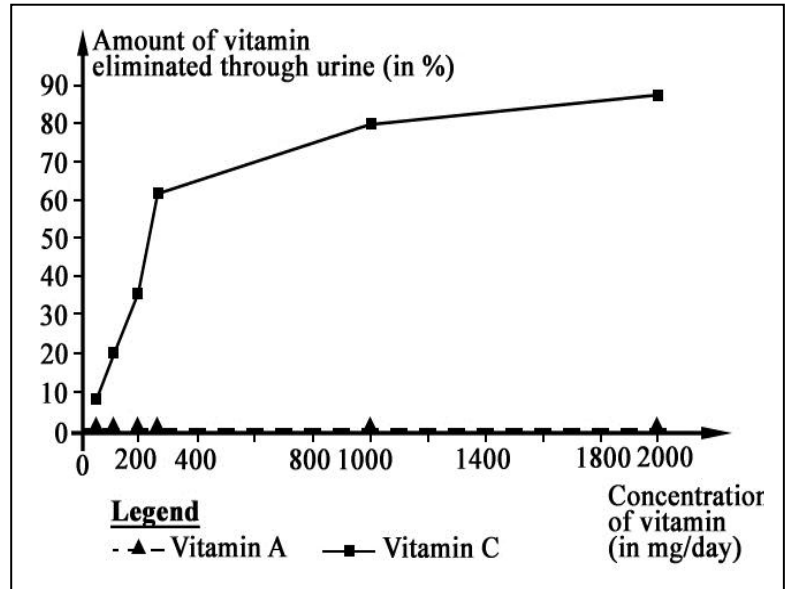
Exercise 1 (7 points)

Vitamins

Vitamins are organic substances necessary for the body; however they have no proper energetic value. Being not synthesized in sufficient quantities in the body, vitamins should be provided in the food diet. In case of avitaminosis, the deficiency in vitamins contributes to the development of severe diseases such as scurvy or beriberi... Also, in case of hypervitaminosis, the excess of certain vitamins is toxic.

It is common to group vitamins according to their solubility and to contrast between liposoluble vitamins and hydrosoluble vitamins. The following document shows the elimination of two vitamins through urine, a hydrosoluble one, the vitamin C, and a liposoluble one, the vitamin A, as a function of the ingested dose.

- Pick out the effect:
 - 1-1 Of a deficiency in vitamins.
 - 1-2 Of an excess in vitamins.
- Distinguish between liposoluble vitamins and hydrosoluble vitamins.
- Show, by referring to the adjacent document that hydrosoluble vitamins are eliminated while liposoluble vitamins are stored in the body.
- Justify the following statement: « It is not advisable to a healthy individual to take vitamins supplements».
- Indicate the role of each of vitamins A and C.
- Name two other vitamins, a liposoluble one and a hydrosoluble one.



Exercise 2 (6 points)

Osteoporosis

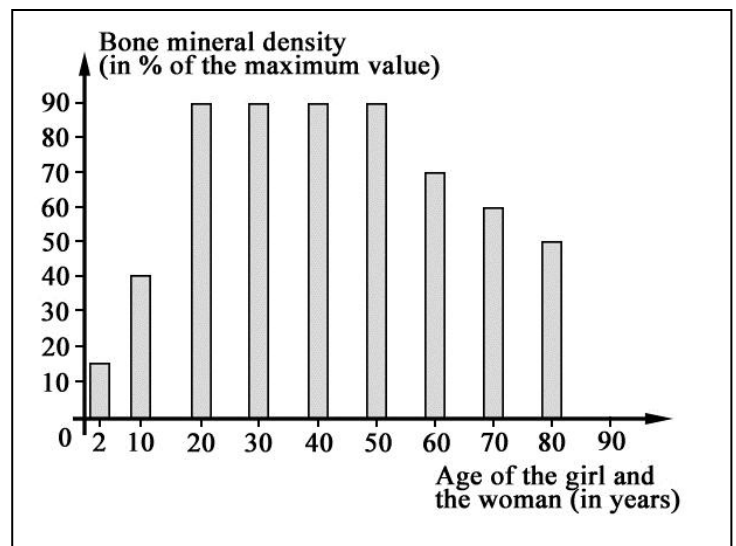
Osteoporosis is a nutritional disease. It mainly affects women and is characterized by fragile bones and by an increased risk of fracture. The hardness of bones is essentially due to calcium salts and to proteins which enter in their structure. In order to detect this disease we measure the mineral density of bones which corresponds to the concentration of calcium fixed by the bones. This density depends on the adopted food diet, mainly during the growth period, and on other factors such as genetic factors.

Document 1

- 1- Pick out from the text :
 - 1-1- The characteristics of osteoporosis.
 - 1-2- The definition of mineral density of bones.
- 2- Name two foods and one vitamin that are necessary to build a strong skeleton.

Researchers monitored the bone mineral density, in women, from childhood to old age. The results are presented in document 2.

- 3- Interpret these variations.
- 4- Justify the following statement. «Preventive measures against osteoporosis should be adopted very early in the life an individual».



Document 2

Exercise 3 (7 points)

Binge Drinking

The «binge drinking» consists of a quick ingestion of high quantities of alcohol in order to reach drunkenness rapidly. A national authority examines a law project concerning binge drinking and aiming to make arrangements to alert the young population and to forbid the alcoholization among adolescents.

Document 1 shows the evolution of this habit in young people in a population during the last ten years.

Document 2 shows the consequences of alcoholization on health.

	Drunkenness	
	1 time /year	3 times /year
2004	33%	15%
2014	46%	29%

Document 1

- 1- Draw a histogram showing the variation of the percentages of drunkenness as function of years.
- 2- Pick out the definition of the “binge drinking” and that of the ethylic coma.
- 3- Draw out the cause of the cerebral damage.
- 4- Justify, referring to documents 1 and 2, the alert raised by the national authority.

The consumption of a high quantity of alcohol can provoke an ethylic coma. It is a toxic or a metabolic coma that encompasses muscle weakness, respiratory difficulties, reduction of arterial pressure and reduction of body temperature. Ethylic coma is dangerous and may lead to death!

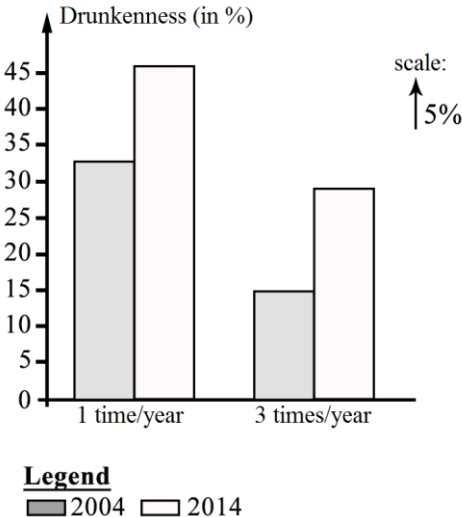
Chronic alcoholization leads to deficiencies in two vitamins, B1 and PP. This deficiency provokes the degeneration of neurons that will finally be destroyed. This cerebral damage is irreversible. The intellectual capacities are definitely reduced.

Document 2

مسابقة في الثقافة العلمية
مادة علوم الحياة
اسس التصحيح

Part of the ex	Exercise 1 Vitamins	Mark 7 pts
1-1	The deficiency in vitamins contributes to the development of severe diseases such as scurvy or beriberi.	1/2
1-2	The excess of certain vitamins is toxic.	1/2
2	Hydrosoluble vitamins are soluble in water whereas liposoluble vitamins are soluble in fats.	1
3	The amount of eliminated vitamin C is 8 % when the ingested dose is 50 mg/day. This amount increases rapidly to reach 90% when the ingested dose increases to 200 mg/day. Since vitamin C is hydrosoluble, thus hydrosoluble vitamins are eliminated. Whereas the amount of eliminated vitamin A is almost nil and constant for all the ingested doses. Thus vitamin A is not eliminated; it is stored. Since vitamin A is liposoluble, thus liposoluble vitamins are stored.	1 1/2
4	In the case of taking hydrosoluble vitamins supplements, the body eliminates the excess. So it's a loss. In the case of taking liposoluble vitamin supplements, the organism stores the excess; this may lead to toxicity by hypervitaminosis. Thus it's dangerous to take liposoluble vitamins in supplementary doses. This justifies why it is not advisable to a healthy individual to take vitamins supplements.	1 1/2
5	Vitamin A: important for vision, allows to fight against infections, necessary for children's growth, maintains the integrity of skin and mucosa. Vitamin C : favors iron absorption and fights against anemia, stimulates the body defenses (anti-infections role)	1
6	Hydrosoluble vitamin: B Liposoluble vitamin : D, E or K.	1

Part of the ex.	Exercise 2 Osteoporosis	Mark 6 pts
1-1	Osteoporosis affects women and is characterized by fragile bones and by an increased risk of fracture.	1
1-2	The mineral density of bones corresponds to the concentration of calcium fixed by the bones.	1
2	Milk, eggs. Vitamin D	1 1/2
3	The mineral density of bones increases from 15% to reach a maximum of 90% from the age of 2 years till the age of 20 years. Thus bones are formed before adult age. This density remains constant till the age of 50 years. However, it decreases gradually to 50% at the age of 80 years. Thus bones get degraded during aging.	11/4
4	The document shows that the bones formation is done before the age of 20 years (15 to 90%), that's why a food diet rich in proteins and calcium is necessary during childhood and adolescence in order to allow the formation of a strong bones, and allows the compensation of the loss during aging.	11/4

Part of the ex	Exercise 3 Binge drinking	Mark 7 pts
1	<p>Histogram showing the variation of the percentages of drunkenness as function of years</p>  <p>Legend 2004 2014</p>	2
2	<p>Binge drinking: consists of a quick ingestion of high quantities of alcohol in order to reach drunkenness rapidly. Ethylic coma: It is a toxic or a metabolic coma that encompasses muscle weakness, respiratory difficulties, reduction of arterial pressure and reduction of body temperature.</p>	2
3	<p>The cerebral damage is due to the degeneration of neurons by lack of vitamins B1 and PP</p>	1
4	<p>Drunkenness has increased from 15% to 29% between 2004 and 2014 for three drunkenness/year and 33% to 46% for one drunkenness/year (document 1). Thus there is an increase in excessive alcoholization in young people. Since alcoholization leads to ethylic coma and to irreversible brain damages (document 2), therefore the alert raised by the national authority to forbid the binge drinking is justified.</p>	2