This Exam Includes two Exercises. It is inscribed on five pages numbered 1 and 5.
The Use of a non-programmable calculator is allowed.

مسابقة في مادة الثقافة العلمية ـ مادة الكيمياء

المدة: ساعة واحدة

(لغة انكليزية)

الاسم:.............................

الرقم: ....

Answer the Two following Exercises:

First Exercise (10 points)   Dietary Factors and Heart Disease Risk

A number of studies have demonstrated an inverse relationship between the consumption of fruits and vegetables and the incidence of cardiovascular disease…. Fruits, vegetables, whole grains, and legumes are good sources of fiber, vitamins, minerals, and phytochemicals. The vitamins (such as C and E), minerals, and phytochemicals in plant foods protect against heart disease because many have antioxidant functions. Antioxidants decrease the oxidation of LDL cholesterol and therefore are hypothesized to prevent development of plaque in artery walls.

Adequate intakes of vitamin B_6, vitamin B_{12}, and folic acid (B_9) can help protect against heart disease because they keep blood levels of the amino acid homocysteine low. ….

Niacin (B_1) is another B vitamin that may affect heart disease risk. When consumed in extremely high doses the nicotinic acid form of niacin can be used to lower blood cholesterol.

Extracted from: Smolin, l., Grosvenor, M. Nutrition: science&applications.WILEY, 2007.

Questions

1. Referring to the text :

    1.1. Pick out <u>two sentences showing the importance of vitamins</u> B in protecting against heart disease.

    1.2. The suggestion to use vitamins C and E as supplements to reduce the risk of cardiovascular disease. **Justify**.

2. Vitamins are classified into hydrosoluble vitamins and liposoluble vitamins.

    2.1. Define <u>the two terms</u> for this classification.

    2.2. Give <u>the class</u> of each of the <u>six vitamins</u> listed in the text.

3. It is advised to consume raw fruits and vegetables rather than to consume them cooked in water at high temperature. **Give** <u>two reasons</u> **justifying** this advice.

4. Choose <u>the correct answer</u>:

    4.1. The <u>chemical elements</u> that constitute <u>simple lipids</u>:

      a. C, H and N   **b**. C, H and O   **c**. H, O and N

    4.2. The <u>energetic nutrients</u> are:

      a. Vitamins and minerals   **b**. Water and fibers   **c**. Lipids and carbohydrates

5. The label of the dark chocolate « *lindt* » shows, among others, the following nutritional information per 100g:
- Carbohydrates: 23 g ;
- protein: 9.2 g ;
- total fat: 47g

Given:
- 1g of carbohydrates gives 3.75 kcal
- 1 g of proteins gives 4 kcal
- 1 g of lipids gives 9 kcal

5.1.Indicate <u>the role of cholesterol</u> in the human body.

5.2. Calculate <u>the energy value</u> of 100 g of « *lindt* ».

Second Exercise (10 points)   Treatment of Arthritis

Arthritis means inflammation of joints. This inflammation leads to stiffness, pain, instability and weakness in the body that worsens with age.

Ibuprofen (Motrin®) is a non-steroidal anti-inflammatory drug. It helps to reduce blood loss from heavy menstrual bleeding and also used for relief of symptoms of arthritis (osteoarthritis).

Many people have experienced side effects to non-steroidal anti-inflammatory drugs and other anti-inflammatory drugs, including nausea, gastrointestinal bleeding, raised liver enzymes, diarrhea, headache, dizziness, salt and fluid retention.

Extracted from: "Wikipedia, free encyclopedia, A DRUG information sheet (Drugs and Arthritis), Science Daily (Sep, 2005 Aug, 2007)".

Questions

1. Referring to the text, answer the following questions:
    1.1.   **Pick out** the four symptoms of arthritis.
    1.2.   **Give** the generic name and the trade name of the anti-inflammatory drug used for treating arthritis.
    1.3.   **Indicate** two side effects of using non-steroidal anti-inflammatory drugs.

2. **Correct** the following two statements:
    2.1. Non-steroidal anti-inflammatory drugs are used to inhibit the growth of microorganisms.
    2.2. Two symptoms of Cortisone overdose which is a steroidal anti-inflammatory drug are weight loss and nausea.

3. Match the items in column A to the **corresponding items** in column B.

Column A	Column B
a. Bactericidal antibiotics	**i.** Kill fungi
b. Fungicidal antibiotics	**ii.** Reduce the excessive gastric acid
c. Anti-acids	**iii.** Kill bacteria
d. Tranquilizers	**iv.** Relieve anxiety

4. In certain infection cases, such as otitis in infants, treatment with anti-inflammatory is associated with antibiotic.

   4.1. In case where the bacterium of otitis infection is unknown

      4.1.1. **Indicate** the nature of the spectrum of the antibiotic to be prescribed.

      4.1.2. **Justify** your choice.

   4.2. Once antibiotic treatment is started, it is very important that patient continues to take his/her antibiotic dosage as prescribed, even if he/she recovers. Justify.