This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 05

07MAY2024

Do NOT write in this box. Your MARK will be placed here.

Subject :	Chemistry
Class :	11SE
Teacher :	Mrs. Mirella Freige
Duration :	1 hour

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Frosties "Sugar Frosted Flakes of Corn" (20 points)

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 375 Kcal

Fat	0.6 g
Carbohydrate	88 g
Fiber	2 g
Protein	4.5 g
Vitamin D	4.2 µg
Vitamin B_{12}	2.1 µg
Vitamin B_1	0.91µg
Calcium	456 mg
Iron	8 mg

Document-1

Questions

1. List the five types of nutrients needed for a balanced diet.
2. Identify the three requirements of the human body.
3. Indicate the three classes of carbohydrates, then give two examples of each class.
4. Name the elements that compose the carbohydrates.
5. Pick out, from the text, one food additive.
6. Corn flakes are important source of fiber.

   Indicate the importance of fiber in the human diet.

7. Name the sugar stored in plants and that in animals.

8. Vitamins are classified into hydrosoluble and liposoluble.

   8.1. Give the meaning of each term.

   8.2. Define vitamins.

   8.3. Indicate the class of each vitamin mentioned in document-1.

9. 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.

10. Proteins are macromolecules in which the monomer units are amino acids.

   10.1. List four biological functions of proteins.

   10.2. Define essential amino acids.

   10.3. Give the name of the elements that compose proteins.

11. Fats and oils are simple lipids that are derived from saturated and unsaturated fatty acids respectively. Choose the correct answer:

   11.1. The covalent bonds between the carbon atoms, in a molecule of saturated fatty acids are:

   a. double covalent bonds.
   b. simple and double covalent bonds.
   c. simple covalent bonds.

   11.2. At room temperature, the unsaturated fatty acids are:

   a. solid
   b. liquid.

12. 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 representations:

Carbohydrates → ……. + O_2 → ….. + …… + ….. .

Lipids → …+…. + O_2 → ….. + …… + ….. .

Proteins → ……. + O_2 → ….. + …… + …..

13. Verify the energy value provided by 100 g of the above "Sugar frosted Flakes of Corn".

SE 05/20232024/Chemistry/11SE

Frosties "Sugar Frosted Flakes of Corn"

1. The five nutrients needed for a balanced diet are : (0.25 each)
- Carbohydrates
- Lipids
- Proteins
- Vitamins
- Minerals.

2. The three requirements of the human body are : (0.5 each)
- Energy provided by carbs, Lipids and sometimes proteins.
- Growth and development provided by proteins.
- Balance and proper functioning covered by vitamins and minerals.

3. Classes of carbohydrates: (0.75 each)
- Monosaccharides : Glucose - Fructose.
- Disaccharides (oligosaccharides) : Lactose - Sucrose.
- Polysaccharides : Glycogen - Cellulose.

4. Carbon, Hydrogen and Oxygen. (0.75)

5. Barley malt flavoring is a food additive. (0.25)

6. Fiber facilitates the digestion and the digestive transit, thus reduces the risk of colon cancer (1)

7. Starch is stored in plants. (0.5)
Glycogen is stored in animals. (0.5)

8.8.1: Hydrosoluble vitamins: vitamins soluble in water. (0.5)
Liposoluble vitamins: vitamins soluble in fats. (0.5)

8.2. Vitamins are organic compounds, natural or synthetic essential for the proper functioning and the balance of the human body. (1.5)

8.3. Vitamin D: Liposoluble. (0.25)
Vitamins B_1 and B_{12} are hydrosoluble. (0.5)

9. Daily need of Calcium is 900mg > 100mg, so Ca is macroelement. (0.75)
Daily need of iron is 18mg < 20mg, so iron is oligoelement (Trace-mineral) (0.75)

10. 10.1. functions of proteins: - Enzymes (0.25 each)
- Transport.
- Defense
- Structure.

10.2. Essential amino acids: essential for the human body, not synthesized by the body, they must be provided by food. (0.75)

10.3. Carbon - Hydrogen - oxygen and nitrogen. (1)

11. 11.1-c, 11.2-b. (0.5)

12. Carbohydrates $\xrightarrow{\text{digestion}}$ Glucose $+ O_2 \longrightarrow CO_2 + H_2O +$ Energy (1)
Lipids $\longrightarrow$ Fatty Acids + Glycerol $\xrightarrow{+O_2} CO_2 + H_2O +$ Energy (1)
Proteins $\longrightarrow$ Amino Acids $+ O_2 \longrightarrow CO_2 + H_2O +$ Energy. (1)

13. Energy value = $(4.5g \times 4)_{\text{Proteins}} + (88 \times 4)_{\text{Carbs}} + (9 \times 0.6)_{\text{Lipids}} = 375.4$ Kcal
Verified (1)