GRADE 10

LIFE SCIENCES

THE CHEMISTRY OF LIFE

QUESTION 1

1. Define inorganic compounds and list three examples important for life.
2. Water is often called the “universal solvent.” Justify this statement by describing at least four roles of water in living organisms.
3. Explain what is meant by macro and micro elements in plants and animals. Give two examples of each.
4. Discuss the consequences of a deficiency of:
    - Iron in humans
    - Iodine in humans
    - Nitrogen in plants
5. Define the term "eutrophication" and explain how human activities contribute to it.
6. Draw a labelled diagram showing the stages of eutrophication.
7. Explain how fertiliser runoff causes long-term damage to aquatic ecosystems.
8. Describe how mineral nutrients are absorbed by plant roots and transported through the plant.
9. Differentiate between macro elements and micro elements in terms of required amounts and physiological roles.
10. Discuss at least three ways to prevent eutrophication and promote sustainable farming practices.

QUESTION 2

1. Define carbohydrates and classify them into monosaccharides, disaccharides, and polysaccharides with one example of each.
2. **Draw and label** a simple diagram of a glucose molecule (monosaccharide).
3. Describe three structural and three energy-related functions of carbohydrates in organisms.
4. Explain how to test for:
    - Starch
    - Glucose
      Include procedures, chemicals used, and colour changes.
5. Define lipids and discuss their structural and functional roles in animal cells.
6. Compare saturated and unsaturated fats in terms of structure, sources, and health impact.
7. Describe the structure of a triglyceride molecule and explain how it is formed.
8. Explain how to test for the presence of lipids in a food sample.

9. Define proteins and explain their importance to organisms. Give four examples of their biological roles.
10. Describe the **Biuret test** for proteins and interpret possible outcomes.

QUESTION 3

1. Define an enzyme and explain how it functions as a biological catalyst.
2. Draw and explain the **lock and key model** of enzyme action.
3. List three factors that affect enzyme activity and explain how each affects reaction rate.
4. Explain the terms "optimum temperature" and "optimum pH" for enzyme activity.
5. Discuss what happens to an enzyme when it is denatured.
6. Describe a real-life application of enzymes in:
    - Industry
    - Digestion
7. Differentiate between fat-soluble and water-soluble vitamins.
8. Describe the role of Vitamin C in humans and the symptoms of its deficiency.
9. Explain the role of Vitamin D in bone development and the effect of its deficiency.
10. Suggest reasons why vitamins must be taken regularly even in small amounts.