1. Which of the following macromolecules serves as the primary source of immediate energy in cells?
   a) Proteins
   b) Lipids
   c) Carbohydrates
   d) Nucleic acids

2. What type of bond links amino acids together in a protein?
   a) Glycosidic bond
   b) Peptide bond
   c) Phosphodiester bond
   d) Hydrogen bond

3. Which macromolecule is responsible for storing genetic information?
   a) Proteins
   b) Lipids
   c) Carbohydrates
   d) Nucleic acids

4. What is the monomer of carbohydrates?
   a) Nucleotide
   b) Monosaccharide
   c) Amino acid
   d) Fatty acid

5. Which type of lipid is the main structural component of cell membranes?
   a) Triglycerides
   b) Steroids
   c) Phospholipids
   d) Waxes

6. **Compare and contrast** the structure and function of saturated and unsaturated fatty acids.

7. **Explain** the role of enzymes in macromolecule breakdown. Provide an example of an enzyme and its substrate.

8. **Describe** how dehydration synthesis and hydrolysis reactions are involved in the formation and breakdown of macromolecules.

9. **Explain** the difference between a **monosaccharide, disaccharide, and polysaccharide**, and provide an example of each.

10. **Describe** the structural differences between DNA and RNA.

11. **Identify** the primary function of each of the four macromolecule types and provide an example of where they are found in the human body.

9. A patient is diagnosed with lactose intolerance, which results from a deficiency of the enzyme lactase.
    - a) What type of macromolecule is lactase?
    - b) How does lactase normally function in the digestion of lactose?
    - c) Explain why individuals with lactose intolerance experience digestive discomfort.

10. A scientist is analyzing an unknown organic molecule and finds that it contains carbon, hydrogen, and oxygen in a 1:2:1 ratio.

- a) Identify the macromolecule type.
- b) What test could the scientist use to confirm the presence of this macromolecule?
- c) What is the function of this macromolecule in living organisms?

11. **Lipids are essential for life and serve multiple functions.**

    a) Describe the difference between **triglycerides, phospholipids, and steroids** in terms of structure and function.

    b) Explain why saturated fats are typically solid at room temperature while unsaturated fats are liquid.

    c) Discuss the potential health effects of consuming excessive saturated and trans fats.

12. **Proteins have a wide range of functions in the human body.**

- a) Describe the four levels of protein structure.
- b) Explain the importance of protein shape for enzyme function.
- c) How can factors such as pH and temperature affect protein structure and function?