1. What are the three most commonly occurring elements?

2. State one function of each of these elements:

a. Iron

b. Sulphur

c. Calcium

d. Phosphorous

e. Sodium

3. Define *organic molecule.*

5. In the space below, draw three water molecules attracted to one another by hydrogen bonding. Include labels to show the polarity of the molecules.

6. Water has many properties which are essential for life. Complete the table below.

|  |  |  |
| --- | --- | --- |
|  | Explanation | Significance to living things |
| Thermal Properties | . |  |
| Cohesion |  |  |
| Solvent Properties |  |  |

(include uses as a coolant, medium for metabolic reactions, transport medium)

7. In the space below, draw the structure of a general amino acid. Include (and label) the *amino, carboxyl* and ‘*R’ groups*.

8. In the space below, draw the generalized structures of fatty acids and glycerol.

9. Draw the structures of glucose and ribose.

10. Complete the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| *-saccharides* | examples | Plant or animal? | Function/ uses |
| Mono- | Glucose |  |  |
| Galactose | Animal | ‘brain sugar’ – less sweet/ less soluble |
|  | Plant |  |
| Di- | Lactose |  |  |
|  | plant |  |
|  | animal | Dimer of glucose, broken down from starch. |
| Poly- | Starch |  |  |
|  | animal | Insoluble storage of glucose |
|  | plant |  |

11. Using labeled diagrams, describe how a monosaccharide (glucose) is converted to a disaccharide (maltose). What is the name of this process?

12. What is the name of the process through which polypeptides, polysaccharides or triglycerides are catabolised (broken down)?

13. On a separate sheet of paper, outline condensation and hydrolysis in proteins, saccharides and triglycerides. Label the reactions and bonds formed/ broken clearly.

14. Triglycerides can have saturated or unsaturated fatty acids attached.

Differentiate between saturated and unsaturated fats in terms of:

1. Bonds in the fatty acid chain

b. Melting point/ state at room temperature

c. Origin (plants or animals)

15. State three functions of lipids: