Introduction to Biochemistry

What is the difference between an inorganic and organic compound?

ORGANIC compounds contain the elements **CARBON** and **HYDROGEN.**

- ✓ Examples of organic compounds are:
  - --**CH_4** (methane)
  - --**$C_6H_{12}O_6$** (simple sugar – glucose)

INORGANIC compounds contain any combination of elements including carbon **OR** hydrogen

- ✓ Examples of inorganic compounds are:
  - --**H_2O** (water)
  - --**CO2** (carbon dioxide)
  - --**SO_2** (sulfur dioxide)

What four elements are found in all living organisms?

- ✓ Carbon (C)
- ✓ Hydrogen (H)
- ✓ Oxygen (O)
- ✓ Nitrogen (N)

Other elements are found in the body in **trace** amounts include:

- ✓ Iron
- ✓ Calcium
- ✓ Sulfur
- ✓ Potassium
- ✓ Magnesium
- ✓ Phosphorus
- ✓ Chlorine
- ✓ Sodium

What are the four major groups of organic compounds found in all living organisms?

- ✓ **Carbohydrates:** sugars and starches
- ✓ **Lipids:** fats, oils and waxes
- ✓ **Proteins**
- ✓ **Nucleic Acids:** DNA and RNA

Carbohydrates: (sugars and starches)

- ✓ Building blocks are repeating units of **simple sugars like glucose**
- ✓ Glucose is used as an **immediate source of energy** by most living organisms
- ✓ Extra sugar as starches (lots of simple sugars linked in a chain)

Lipids: fats, waxes, and oils

- ✓ Building blocks are **fatty acids and glycerol**
- ✓ Used as a **reserve energy source** by most living organisms
- ✓ Lipids also make up parts of the cell including the cell membrane

Proteins:

- ✓ Building blocks are repeating units of **amino acids**
- ✓ There are four major functions of proteins in living things:
  --**hormones** are chemical messengers that help to regulate life processes
  --**structural body parts** such as hair, nails, part of cell membranes
  --**pigments** such as hemoglobin and chlorophyll
  --**enzymes** which control the rate of chemical reactions (also known as **organic catalysts**)

Nucleic Acids:

- ✓ Building blocks are repeating units of **nucleotides**
- ✓ Include DNA and RNA
- ✓ **Store the hereditary (genetic information)** within the chromosomes found in the nuclei of cells.

Please answer the following questions:

1. Inorganic or Organic: Examine the compounds listed below. Write a capital letter **O** if you think the compound is organic or a capital **I** if you think it is inorganic.

_____NH_3 _____H_2SO_4
_____C_6H_6 _____CO_2
_____HCl _____$C_{12}H_{22}O_{11}$

2. What are the four most common elements found in living things?

3. For the following trace elements, please write the chemical symbol next to each element (you may need your textbook or reference for this).

_____Iron _____Magnesium
_____Calcium _____Phosphorus
_____Sulfur _____Chlorine
_____Potassium _____Sodium

4. Please fill in the chart below.

Organic Compound	Building Blocks	Functions in Living Organisms
Carbohydrates		
Lipids		
Proteins		
Nucleic Acids		