**PROTEIN**

**A labelled diagram to represent enzyme activity:**

The active site and the substrate are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_.

Examples of **catalytic** enzymes

* Pepsin – catalyses the breakdown of \_\_\_\_\_\_\_
* Lact**ase** – catalyses the breakdown of \_\_\_\_\_\_\_
* Sucr**ase** – catalyses the breakdown of \_\_\_\_\_\_\_
* RNA polymer**ase** – catalyses the build-up of \_\_\_\_

**Protein Function**

Each type of protein has a specific function. Proteins can act as \_\_\_\_\_\_\_, which catalyse chemical reactions. A \_\_\_\_\_\_\_\_ is a substance that reduces the energy required for a reaction to happen. Enzymes are not \_\_\_\_\_\_\_\_ by the reactions they catalyse, so are recyclable.

The substance an enzyme acts on is called a \_\_\_\_\_\_\_\_\_.

Reactions can be \_\_\_\_\_\_\_\_\_, which means a substrate is broken down, or \_\_\_\_\_\_\_\_, which means a substrates are built up.

The general word equation for a reaction is therefore:

Catabolic example: enzyme + \_\_\_\_\_\_\_\_\_ 🡪 enzyme + p\_\_\_\_\_\_\_

Anabolic example: enzyme + \_\_\_\_\_\_\_\_\_\_ 🡪 enzyme + p\_\_\_\_\_\_\_

**Levels of Protein Structure**

Primary –

Secondary –

Tertiary –

Quaternary -

**Protein** – Composed of the elements C, H, O and N (and sometimes S or P)

* Proteins are \_\_\_\_\_\_\_\_ (chains of single units bonded together). The monomers that make up a protein are \_\_\_\_\_ acids. There are 20 different amino acids.
* It is the order and combination of amino acids that determine the shape of a protein. The \_\_\_\_\_ of a protein determines it’s function.
* The synthesis of protein basically involves:

1. \_\_\_ – This stores the information for producing/sequencing the amino acids in a protein.
2. \_\_\_\_ – which carries the protein code from DNA to a ribosome.
3. \_\_\_\_\_\_\_\_\_ (Free or on the Rough Endoplasmic Reticulum) Which translate the mRNA into a protein by combining amino acids together.

**Other protein functions**

**Transport proteins –**

**Structural proteins –**

**Keywords:**

**Enzyme**

**Amino – acid**

**Denature**

**Optimum level**

**Polymer**

**Monomer**

**Catabolic**

**Anabolic**

**Factors affecting enzyme activity**

**Temperature:** Different enzymes function optimally at different temperatures. All tend to follow a certain pattern though. As temperature \_\_\_\_\_\_\_\_\_, enzyme activity also increases, up to an optimum point, then as temperature continues to increase, enzyme activity will \_\_\_\_\_\_\_\_. This is illustrated in the graph below.

Enzyme activity

Temperature

**pH –** the acidity of the environment can affect enzyme activity. Follows the same pattern as above for temperature.

**Why enzymes stop working**

Enzymes can become \_\_\_\_\_\_\_\_\_ when the temperature or pH is outside their tolerance levels.

Denaturation occurs when extreme temperatures or pH break the \_\_\_\_\_ between amino acids that make up the protein. When these bonds break, the protein loses it’s shape. When a protein loses it’s shape, it cannot bind to a \_\_\_\_\_\_\_\_\_, and therefore cannot catalyse a \_\_\_\_\_\_\_\_.

A labelled diagram to represent this;