

# ASSIGNMENT FOR PHYSIOLOGY

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## Q.1

**Explain homeostatic mechanism regarding the control of calcium in the body with reference to parathyroid hormone and calcitonin.**

### Answer:

- Calcium metabolism or calcium homeostasis is the mechanism by the body maintain adequate calcium level.
- Calcium release from bone is regulated by parathyroid hormone.
- Calcitonin stimulates incorporation of calcium in bone.
- Parathyroid hormone regulate level of calcium in blood.

#### **Control of Calcium level in the body:**

Calcitonin is involved in helping to regulate level of calcium and phosphate in the blood opposing the action of parathyroid hormone.

#### **Calcitonin reduce calcium level in the blood by two main mechanisms:**

It inhibits the activity of osteoclasts, which are the cells responsible for breaking down the bone.

#### **Reference to Parathyroid Hormone:**

Parathyroid hormone regulate calcium level in the blood, largely by increasing the level when they are too low. It does the this through it's action on the kidneys, bones and intestine:

##### **BONES:**

Parathyroid hormones stimulates the release of calcium for large calcium store in the bone into the blood stream.

#### **Parathyroid Hormones Maintain Homeostasis:**

Parathyroid hormone increases blood calcium levels when they drop too low. Conversely, Calcitonin, which is released from the thyroid gland, decreases blood calcium levels when they become too high.

## Q.2

**Classify enzymes and their function in digestion.**

### ANSWER

#### Classification of Enzymes

According to the International Union of Biochemists (IUB-1961), enzymes can be divided into 6 classes based on nature.

#### **1. Oxidoreductase:**

Catalyze removal or addition of hydrogen atom, oxygen atom or electron from one substrate to another. They are also called oxidases, reductases or dehydrogenases.

**Example:** Cytochrome Oxidase, Alcohol dehydrogenase.



#### **2. Transferases:**

Catalyzes transfer of functional group like phosphate group, sulphur and also atoms etc.

**Example:** Kinases, Transaminases.



#### **3. Hydrolases:**

Catalyzes hydrolysis reaction that is breakdown of covalent bond to introduction of water.

**Example:** Sucrose + H<sub>2</sub>O ↔ Glucose + Fructose

#### **4. Lyases:**

catalyzes the breaking (an "elimination" reaction).

**Example:** ATP



#### **5. Isomerases:**

Catalyze the rearrangement of molecular structure to isomer include epimerization and cis-trans isomerization.

**Example:** Isomerases. Epimerizes



## 6. Ligases:

Catalyze synthesis of various bond coupled with breakdown of energy containing substrate. Usually ATP and molecule to substrate.

Example: Carboxylase



### The ROLE OF ENZYME IN DIGESTION

- Chemical digestions could not take place without the help of digestive system
- An enzyme is a protein that speed up chemical reaction in the body.
- Digestive enzymes speed up chemical reaction that breakdown large food molecules into small molecules.

#### ***Digestive Enzymes and there Functions***

- Amylase produces in the mouth. It helps the large starch molecules into small sugar molecules.
- **Pepsine**, produces in the stomach.
- **Trypsine**, produces in pancreas.
- **Pancreatic lipase**, produces in pancreas.
- **Deoxyribonuclease and ribonuclease**, produces in the Pancrease.

### Q.3

*Give clinical differentiation between hypothyroidism and hyperthyroidism.*

#### **ANSWER**

The difference **b/w** two diseases relates to Hormone Level.

#### **HYPOTHYROIDISM**

This is a condition that thyroid hormones decrease in a bloodstream.

Hypothyroidism leads to **decrease** in thyroid hormones.

Following are the common **SYMPTOMS** of this disease:

- Slow metabolism
- Obesity
- Long sleeping patterns
- Low heartbeat (cardiac output)
- Low blood pressure

Following are **CAUSES** of this disease:

- Not enough iodine in food
- Hashimoto's disease
- Antithyroid medication toxicity
- Pituitary tumor

#### **HYPERTHYROIDISM**

**H**yperthyroidism leads to an **increase** in thyroid hormone production. However, it is not uncommon to have an overactive thyroid and then an underactive thyroid, or vice versa.

Following are the common **SYMPTOMS** of this disease:

- Fast metabolism
- Polyphagia

- Short sleeping patterns
- Fast heartbeat

Following are **CAUSES** of this disease:

- Having too much of iodine
- Greaves disease
- Thyroid replacement toxicity
- Toxic nodular goiter