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**IQRA NATIONAL UNIVERSITY**

**Mid Term Examination**

**PHYSIOLOGY**

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**BS(HND)**

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**Mid-Term Assignment**

**Course Title: Human Physiology Instructor: Dr Sara Naeem Total Marks: 30**

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1. **Differentiate between the following**
2. **Positive and negative feedback mechanism**

**Positive feedback mechanism**:

In positive feedback mechanism the output enhances the original stimulus.

It strengthens or reinforces a change in one of the body’s control conditions.

An example of a positive feedback system can be child birth. During labour, a hormone named as oxytocin is released that intensifies and speeds up the uterine contractions. The increase in contractions causes more oxytocin to be released and the cycle goes on until the baby is delivered. The birth ends up the release of oxytocin and ends the positive feedback mechanism.

Another example of a positive feedback mechanism can be blood clotting. If a vessel gets damaged the platelets moves towards the injured area and releases chemicals that attract more platelets. The platelets then continue to pile up and release chemicals until a clot is formed.

**Negative feedback mechanism:**

In a negative feedback mechanism, the output reduces the original effect of the stimulus

It reverses a change in control condition.

Regulating Blood sugar: Every time you eat, a negative feedback mechanism controls the level of sugar in your [blood](https://biologydictionary.net/blood/). The main sugar found in your blood is glucose. Your body absorbs the glucose from your bloodstream and deposits it into your blood. This increases the concentration of glucose and stimulates your pancreas to release insulin. As a result, glucose concentrations are depleted in the blood. The negative feedback mechanism in this system can be seen in how high glucose levels lead to the pathway turning on, which leads to a product meant to lower the glucose level. When glucose becomes too low, the pathway shuts off. Another example can be regulation of blood pressure, force exerted by blood as it presses again walls of the blood vessels.

The main difference between a positive and negative feedback is their response to change, positive feedback amplifies change while negative feedback reduces the change.

1. **Smooth and rough endoplasmic reticulum**

**Smooth endoplasmic reticulum:**

Smooth endoplasmic reticulum is not bounded by the ribosomes and is known for storing the lipids and proteins.

It contains many circular marks which are the interlocking tubular sheets.

It is found near the cell membrane.

It originates from rough endoplasmic reticulum by giving off the ribosomes.

It mainly produces lipids and protein and function for detoxification.

**Rough endoplasmic reticulum**:

Rough endoplasmic reticulum is bounded by ribosomes and store proteins.

It looks like arrangement of the double membranes which are spotted with the rhibosomes

It appears like consisting of the parallel sheets of membrane.

It originates from nuclear membrane.

It is found near the cytoplasm of the eukaryotic cells.

It produces, secretes and export proteins and some hormones.

The main difference between these two is that the Smooth Endoplasmic Reticulum is not bounded by the ribosomes and is known for storing the lipids and proteins. Meanwhile, the Rough Endoplasmic Reticulum is bounded by the ribosomes and store proteins.

1. **Lysosomes and peroxisomes**

**Lysosomes:**

Lysosomes are rough spherical bodies enclosed by a single membrane. They are manufactured by the [Golgi apparatus](https://www.biology-pages.info/G/Golgi.html) and contain over 50 different kinds of hydrolytic enzymes including [proteases](https://www.biology-pages.info/P/P.html#protease) lipase nuclease polysaccharidase.The [pH](https://www.biology-pages.info/P/pH.html) in lysosome is about 5. They also contain hydrolase. This is the enzyme that is responsible for digestion.

**Perixosomes :**

Perixosomes contain three oxidative enzymes such as catalase, d amino oxidase and uric acid oxidase. This is the enzyme that is responsible for digestion. Peroxisomes are about the size of lysosomes (0.5–1.5 µm) and like them are enclosed by a single membrane. They also resemble lysosomes in being filled with enzymes. New peroxisomes are formed by the fusion of vesicles released by the [endoplasmic reticulum](https://www.biology-pages.info/P/ProteinKinesis.html) with vesicles released by mitochondria in humans. Once formed, peroxisomes can then increase their number by division and growth.

1. **Pepsin and pepsinogen**

**Pepsin**:

The pepsin is the active form of a digestive enzyme which breaks down the proteins into shorter chains of amino acids.

**Pepsinogen:**

Pepsinogen is the inactive form or the enzymes of pepsin.

The difference between pepsin and pepsinogen is that pepsin is the active form of a digestive enzyme that breaks down proteins into shorter chains of the amino acids while pepsinogen is the inactive form or the zymogen of pepsin. Basically, pepsin and pepsinogen are two types of proteases present in the stomach.

1. **Peptic ulcer and duodenal ulcer**

**Peptic ulcer**

A peptic ulcer is a sore on the lining of your stomach’s small intestine or esophagus. A peptic ulcer in the stomach is known as gastric ulcer.

**Duodenal ulcer**

A duodenal ulcer is a peptic ulcer that develops in the first part of the small intestine (duodenum).

1. **What is portal triad? Give clinical significance of portal triad.**

**Portal triad:**

Portal triad is a distinctive component of a hepatic lobule found running among each of the lobule corners that consists of branches of the hepatic artery proper hepatic portal vein and bile ducts as well as other structures.

**Functions :**

Oxygenation zones are numbered inside the diamond shaped echinus in red. The zone closest to the central vein is zone three. Zone closest to the portal triad is the zone one.

Portal triads are composed of three major tubes, branches of the hepatic artery carry oxygenated blood to the hepatocytes whereas branches of the portal vein carry blood with nutrients from the small intestine. The bile duct carries bile products away from the hepatocytes, to the larger ducts and gall bladder.

**Clinical Significance:**

Bringing fibrosis is a type of fibrosis seen in several types of liver injury describes fibrosis from the central vein to the portal triad. Nutrients exit the hepatic portal vein through sinusoids and move into hepatocytes, liver cells that perform metabolic functions.

1. **Give properties of cell membrane structure**

**Cell Membrane:**

The cell membrane is also known as plasma membrane. It is a double layer of lipids and proteins that surrounds a cell and separates the cytoplasm (the contents of the cell) from the surrounding environment. It is selectively permeable membrane which means it only let certain molecules to pass through it.

**Properties of Cell Membrane Structure:**

The cell membrane undergoes continual changes both in its molecular composition and on its structure. It plays an important role in the economy of the cell.

The membrane is involved in intake (endocytosis) and secretion of large particles i.e. macrophages involved in the immune defense system.

They contain receptors and channels that allow specific molecules, such as ions, nutrients, wastes, and metabolic products that mediate cellular and extracellular activities to pass between organelles.The membrane is also the first target of physical chemical and biological agents such as thermal and mechanical stress toxins hormones viruses’ microbes etc. Finally the plasma membrane participates actively in the process of cellular organization during the complete process of morphogenesis.

**THE END**