**Course Title: Introductory Biochemistry**

**HND**

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**Max Marks: 30**

**Note: There are FIVE questions, each carry 6 marks with grand total of 30 marks.**

**ATTEMPT all questions.**

**Avoid copy paste material, as it may deduct your marks.**

Q1: What are the macromolecules found in Plasmalema?

Q2: Write a note on that protein whose stabilizing factor is only H- bond.

Q3: Classify monosaccharides on the basis of number of C-atom along with example.

Q4: Briefly explain amino acids on the basis of polarity of R-group.

Q5: Discuss the Bilaminar structure of Cell membrane.

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**QUESTION#1:**

What are the macromolecules found in plasmalemma?

**ANSWER:**

**PLASMALEMMA:**

The cell membrane is also known as plasmalemma. It is the outermost boundary of cytoplasm. This boundary basically controls the entrance and exit of molecules and ions. The plasmalemma is located in both animal and plant cell. In plant cell plasmalemma is located between cytoplasm and cell wall but as compared to animal cell the plasmalemma is located externally because it does not have a cell wall.

**MACROMOLECULES IN PLASMALEMMA:**

There are three very main macromolecules found in plasmalemma, ie:

1. Lipids
2. Protein
3. Carbohydrates

**LIPIDS:**

The phospholipid present in lipids form a boundary to isolate the cell content from the environment, this boundary helps the cell to enter only selective molecules in it.

Cholestrol increases the bilayer strength flexibility. It is found in the core of membrane.

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**PROTEINS:**

The transport protein present in plasmalemma basically regulates the movement of water soluble substances.

The receptor protein plays a role in intercellular cell communication which happens only in between the cells.

The recognition protein helps to recognize different molecules and ions present in the plasmalemma.

**CARBOHYDRATE:**

In carbohydrate oligosaccharides or polysaccharides are present which help in cells signalling.

**QUESTION#2:**

Classify monosaccharides on the basis of number of C-atom along with example.

**ANSWER:**

**MONOSACCHARIDES**:

These are simple sugars which can not be further hydrolized.

They are further classified into following groups:

1. Triose:

3-C

Glyceral aldehyde

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1. Tetrose:

4-C

Erythrose

1. Pentose:

5-C

Ribose

1. Hexose:

6-C

Glucose and fructose.

**QUESTION#3:**

Briefly explain amino acids on the basis of polarity of R-group.

**ANSWER:**

**AMINO ACIDS:**

Amino acids are organic compounds. They contain amine and carboxyl functional group. They are the building blocks of protein. The side chain(R-Group)is linked with every amino acid. They are involved in almost every body function that is growth, development, healing and repair, normal digestion and providing energy to the body.

**POLARITY OF R-GROUP:**

On the basis of polarity of R-group amino acids are divided into two categories.

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1. Hydrophobic amino acid:

These are those amino acids which have the tendancy to avoid water molecules because hydrophobic are water hating amino acids.

Example:

Alanine, valine, leucine, isoleucine , proline , phenylalanine, methionine, tryptophan.

These are amino acids which are hydrophobic in nature.

1. Hydrophilic amino acid :

These are those amino acids which can link up or associate with water molecule because they are water loving amino acids.

Example:

Glycine, cytosine, aspartic acid, serine, threonine, tyrosine, glutamine, asparagine, lysine, histigine.

These are amino acids which are hydrophilic in nature.

**QUESTION#4:**

Discuss the bilaminar structure of cell membrane.

**ANSWER:**

**BILAMINAR STRUCTURE:**

This structure was presented by two scientists Gorter and Grendel.

In their structure they explained that cell membrane is made of layers of lipids. Thy are arranged in two ways that is hydrophobic and hydrophilic. The outer region shows hydrophilic end which is water loving. The inner end is hydrophobic which is water hating in nature.

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**QUESTION#5:**

Write a note on that protein whose stabilizing factor is H-bond.

**ANSWER:**

**PROTEIN:**

protein is a macronutrient which is essential for muscle mass. It is a complex substance that consists of amino acid which is joined by peptide bond. Proteins are involved in all living organisms and it includes many biological compounds which are enzymes, hormones and antibodies.

Hydrogen bond stabilizes secondary structure which is formed by alpha helix, beta sheets, turns and loops. The hydrogen bond connected to the amino acid between different polypeptide chains in proteins structure.

Secondary structure is a protein which is stabilized by hydrogen bond.