**Course Title: Biochemistry I**

**Micro 2nd**

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**Marks: 50**

**Note:**

**There are FIVE questions, each carry 10 marks with grand total of 50 marks.**

**ATTEMPT all questions and Avoid copy paste material as it may deduct your marks.**

Q1. Define Enzyme Inhibition. Enlist the factors that affect the activity of enzymes.

**Enzyme Inhibition**

An enzyme inhibitor is a molecule that binds to an enzyme and decreases its activity By binding to enzymes' active sites, inhibitors reduce the compatibility of substrate and enzyme and this leads to the inhibition of Enzyme-Substrate complexes' formation, preventing the catalyzation of reactions and decreasing (at times to zero) the amount of product produced by a reaction. It can be said that as the concentration of enzyme inhibitors increases, the rate of enzyme activity decreases, and thus, the amount of product produced is inversely proportional to the concentration of inhibitor molecules. Since blocking an enzyme's activity can kill a pathogens or correct a metabolic imbalance, many drugs are enzyme inhibitors.

**FACTORS EFFECTING THE ACTIVITY OF ENZYME**

Knowledge of basic enzyme kinetic theory is important in enzyme analysis in order both to understand the basic enzymatic mechanism and to select a method for enzyme analysis. The conditions selected to measure the activity of an enzyme would not be the same as those selected to measure the concentration of its substrate. Several factors affect the rate at which enzymatic reactions proceed – 1)Temperature

2) PH

3) Enzyme concentration

4) Substrate concentration

5)The presence of any inhibitors or activators.

Q2. What are the functions of Saccharide? Also write down its types.

**FUNCTION OF SACCHARIDES**

Saccharides are what we commonly know as sugars, The are composed of carbon, Hydrogen and oxygen and are used in the body for everything from the manufacture of DNA to respiration in cells.

Saccharides main function in the body is in respiration, a process without which living creatures could not exist, they are perfect for this job as they oxidize very easily. Only 10% of any sugar can be active or in straight chain form at any one time, the other 90% of the sugars are tied up in a circular form of the sugar which ties up the active group of the sugar, hence preventing it from reacting. H

**TYPES**

The saccharides are divided into four chemical groups:

1)monosaccharides

2) disaccharides

3) oligosaccharides

4) polysaccharides.

Q3. Classify the BLOOR classification of lipids.

**CLASSIFICATION OF LIPIDS**

Lipids are classified into mainly 3 types.

1)Simple lipids are fats/oil & Wax.

2)Compound or Complex lipid are divided into Phospholipid (Glycerophospholipid & Shpingophospholipid), Glycolipid & Lipoprotein.

3) Derived lipids are fatty acids, glycerol, steroids/sterols, polyisoprenoids, fat soluble vitamins

Q4. Discuss fatty acid and its types with example.

**FATTY ACIDS**

In chemistry, particularly in biochemistry, a fatty acid is a carboxylic acid with a long aliphatic chain, which is either saturated or unsaturated. Most naturally occurring fatty acids have an unbranched chain of an even number of carbon atoms, from 4 to 28

**TYPES**

Fatty acids can be divided into four general categories:

1)saturated

2)monounsaturated

3)polyunsaturated

4)trans fats.

Q5. Briefly explain the models of enzyme substrate interaction.

**ENZYME SUBSTRATE INTERACTION**

There are two theories explaining the enzyme-substrate interaction.

In the lock-and-key model, the active site of an enzyme is precisely shaped to hold specific substrates. In the induced-fit model, the active site and substrate don't fit perfectly together; instead, they both alter their shape to connect.

Whatever the case, the reactions that occur accelerate greatly — over a millionfold — once the substrates bind to the active site of the enzyme. The chemical reactions result in a new product or molecule that then separates from the enzyme, which goes on to catalyze other reactions.