**Course Title: Basic Biochemistry**

**MLT**

**Summer Semester**

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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: Define Metabolism and also explain the types of metabolism.**

**Ans:** **METABOLISM:**

A set of all the chemical reaction occurs in living organisims to maintain normal process of life.

OR

Metabolism is the chemical reactions in the body's cells that change food into energy. Our bodies need this energy to do everything from moving to thinking to growing. Specific proteins in the body control the chemical reactions of metabolism is called Metabolism.

**TYPES OF METABOLISM:**

**Anabolism:** Formation/ synthesis of molecules=anabolism

OR

Anabolism is the process by which the body utilizes the energy released by catabolism to synthesize complex molecules. These complex molecules are then utilized to form cellular structures that are formed from small and simple precursors that act as building blocks.

**Basic stages of anabolism:**

* Involves production of precursors such as amino acids, monosaccharides, isoprenoids and nucleotides.
* Involves activation of these precursors into reactive forms using energy from ATP.
* Involves the assembly of these precursors into complex molecules such as proteins, polysaccharides, lipids and nucleic acids.

**Catabolism:** Break down of larger molecules to get energy=catabolism

OR

Catabolism is the set of metabolic processes that break down large molecules.These complex molecules are broken down to produce energy necessary for various functions in the body. The energy is utilized for building or anabolic processes.

**Catabolism in different organisms:**

**in organotrophs,** in this process organic sources are used as a source of energy.

**in lithotrophs,** in this process inorganic substrates are used

**in phototrophs,** in this process sunlight is used as chemical energy.

**Q 2: What are the macromolecules found in Plasmalema?**

**Ans:** The principal components of the plasma membrane are lipids (phospholipids and cholesterol), proteins and carbohydrates group that are attached to some of the lipids and proteins. A phospholipid is a lipid made of glycerol, two fatty acid tails, and a phosphate-linked head group.

**There are major biological macromolecules Found in Plasma Membrane:**

**LIPIDS:**

Phospholipid

Cholesterole

**PROTEINS:**

Transport protein

Receptor protein

Recognition protein

**CARBOHYDRATES:**

Oligosaccharides

**Q3: Briefly explain the formation of Urea.**

**Ans:** **UREA CYCLE:**

Urea cucle is also called krebs Henseleit cycle.A normal man daily consumed 300gm of carbohydrates, 100gm of protein and 100gm of lipids so after the metabolism of such substances about 16.5gm of Nitrogen is excreted per day. In which 95% is excreted through kidney and 5% is in the form of feces.

**Major Path Way:**

The major pathway of nitrogen excretion in human being is urea which is synthesized in the liver release into the blood stream and excreted by the kidneys.

**Site Of Synthesis:**

Urea formation takes place in the liver and all the enzymes involved in urca formation are isolated from liver tissues.

Steps Involved

**There are 5 steps involved in urea cycle.**

1. Synthesis of carbomyl phosphate.

2. Synthesis of citrulline

3. Synthesis of arginiosuccinate

4. Cleavage of argininsuccinate.

5. Cleavage of arginine to form ornithine and urea,

**Enzymes Involved In Urea Cycle;**

Following enzymes are involved in urea cycle:

1. Carbomyl synthetase

2. Ornithine transcarbomylase

3. Arginino succinate synthetase

4. Arginino succinase

5. Arginase

**Process:**

**Synthesis of carbomyl phosphate:**

In the first step Ammonium ion, CO2 and ATP combine phosphate together to form carbomyl phosphate in the presence of enzyme called carbomyl synthetase. .

**Synthesis of citrulline:**

In the second step the carbomyl reacts with omithine in the presence of catalyst called omithine trans carbomylase. Which will fom citrulline and inorganic phosphate.

**Synthesis of argininosuccinate:**

In the 3rd step the citrulline formed in the 2nd step, now reacts with amino group of aspartate to form argininosuccinate. This process occurs in the presence of an enzyme called Argininosuccinate synthetase.

**Cleavage of argininosuccinate:**

In the 4th step the cleavage of argininosuccinate occurs in the presence of an enzyme called arginino succinase which results in the formation of arginine and fumarate.

**Cleavage of Arginine:**

In the last step, the cleavage of Arginine occur in the presence of an enzyme called Argi nase which results in the formation of omithine and urea. The ornithine produce in the final step is used as a substrate in the 2nd step for the formation of Citrulline.

**ADVANTAGE:**

Ammonia is a toxic substance which is produced during metabolism of dietary protein, carbohydrate and lipids. So with the help of urea cycle, toxic ammonia is converted into non toxic substance called urea.

**Q4: Discuss the function of Saccharides.**

**Ans:** Saccharides and their derivatives include many other important biomolecules that play key roles in the immune system, fertilization, preventing pathogenesis, blood clotting, and development. Carbohydrates are central to nutrition and are found in a wide variety of natural and processed foods.

**Function Of Saccharides or Carbohydrates:**

* Provide energy (ATP) to drive metabolic process (GLYCOLYSIS).
* Energy storages molecules, e.g GLYCOGEN.
* Structural component is cell wall.
* Component found in coenzyme (FAD) and nucleic acids.

**Q5: Enlist the Acidic, Aliphatic and Basic amino acids.**

**Ans:**

**1) Acidic and their amid.**

\* Aspartate.

\* Glutamate,

\* Aspargine

\* Glutamine

**2)Aliphatic:**

Glycine

\* Alanine.

\* Valine

\* Leucine

\* Isoleucine

**3) Basic Amino Acid:**

\* Histidine.

\* Lysine.

\* Arginine.

**THE END**