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DEPARTMENT : MLT 1st SEMESTER

SECTION:B

PAPER :Basic biochemistry (theory)

INSTRUCTOR: Sana khaN

Q1: Define Metabolism and also explain the types of metabolism.

Ans: METABOLISM a term that is used to describe all chemical reactions involved in maintaining the living state of the cells and the organism. Metabolism can be conveniently divided into two categories

Catabolism/ Anabolism

Catabolism: the break down of molecules to obtain energy .

Anabolism: the synthesis of all compounds needed by the cell.

There are three basic metabolism types:

Endomorphs:

Endomorphs have a larger bone structure and more overall body fat — evolutionarily speaking, you're better at storing nutrients than the other two types. Endomorphs generally have thicker arms and legs with a round body. It can be hard for an endomorph to lose weight, but not impossible! They typically have strong leg muscles and weaker upper body muscles.

A typical endomorph will have body characteristics like these:

- **Round body**

- **Medium to large joints + bones**
- **Gain muscle and fat easily**
- **Strong leg muscles**
- **Find it hard to lose weight**
- **Fatigues easily**
- **Slow metabolism**

Mesomorphs:

Mesomorphs typically have an athletic, medium build and can gain muscle easily. Unfortunately, they also gain fat easily too, so they need to be careful not to overeat—which many tend to do because they take their naturally athletic body for granted. Mesomorphs should get a decent mix of strength training and cardio, and try to cut back on their carb intake if they want to lose weight.

A typical mesomorph will have body characteristics like these:

- **Athletic**
- **Medium-sized body structure**
- **Strong**
- **Broad shoulders**
- **Gains muscle easily**
- **Responds well to exercise**
- **If they have extra body fat, they tend to carry it in the lower body**

Ectomorphs:

Think that one skinny friend who tends to eat whatever she wants without putting on a pound. That's an ectomorph. Ectomorphs are typically slender with small joints and a light build. They have a narrow frame and fast metabolism, meaning they're often able to overeat without gaining much weight. If you fall under this metabolic type and are looking to maintain a healthy weight while getting stronger, it's key to get enough protein and often recommended to eat smaller meals more often. Also, if you're not already, be sure you're incorporating strength training into your weekly workouts.
A typical ectomorph will have body characteristics like these:

- **Thin, lean body**
- **Flat chest**
- **Small shoulders**
- **Not muscular**
- **Fast metabolism**
- **Prone to periods of hyperactivity**
- **Hard to gain weight**

Q 2: What are the macromolecules found in Plasmalema?

A macromolecule is a very large molecule, such as protein, commonly composed of the polymerization of smaller subunits called monomers.

Plasmalema are lipids (phospholipids and cholesterol), proteins, and carbohydrate groups 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.

Protein/lipids/nucleic acids these macro molecules are found in Plasmalema.

Q3: Briefly explain the formation of Urea.

Uric acid :-

Uric acid is a chemical created when the body breaks down substances called purines. Purines are normally produced in the body and are also found in some foods and drinks. Most uric acid dissolves in the blood and travels to the kidneys, from there it passed out in urine .

Process of uric acid formation:-

- **Catabolism of purines:-**

The catabolic reaction of adenosine or Guanosine give the end product of uric acid .

Steps involved:-

- **Conversion of nucleotide to nucleoside .**
- **Conversion of nucleoside to ionsine .**
- **Synthesis of hypoxanthine.**
- **Formation of xanthine .**

Xanthine is a product on the pathway of purine degradation. It is created from guanine by guanine deaminase. It is created from hypoxanthine by xanthine oxidoreductase. It is also created from xanthosine by purine nucleoside phosphorylase.

Adenine is converted to adenosine or inosine monophosphate (IMP), either of which, in turn, is converted into inosine (I), which pairs with adenine (A), cytosine (C), and uracil (U).
Purine nucleoside phosphorylase intraconverts inosine and hypoxanthine.

Q4: Discuss the 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.

The four primary functions of carbohydrates in the body are to provide energy, store energy, build macromolecules, and spare protein and fat for other uses. Glucose energy is stored as glycogen, with the majority of it in the muscle and liver.

Polysaccharides generally perform one of two functions: energy storage or structural support. Starch and glycogen are highly compact polymers that are used for energy storage. Cellulose and chitin are linear polymers that are used for structural support in plants and animals, respectively.

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

Acidic - aspartic acid (gif, interactive), glutamic acid (gif, interactive) Basic - arginine (gif, interactive), histidine (gif, interactive), lysine (gif, interactive) Hydroxylic - serine (gif, interactive), threonine (gif, interactive) Sulphur-containing - cysteine (gif, interactive), methionine (gif, interactive).

Aliphatic : Alanine, isoleucine, leucine, proline, and valine, are all aliphatic amino acids. Methionine is sometimes considered an aliphatic amino acid even though the side chain contains a sulfur atom because it is fairly non-reactive like the true aliphatic amino acids

Basic: The 9 essential amino acids are: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. These are basic amino acids .

Thank you Mam