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Q1: (A) Write down six level of organization in detail.

Ans:- Before you begin to study the different structures and functions of the human body, it is helpful to consider its basic architecture; that is, how its smallest parts are assembled into larger structures. It is convenient to consider the structures of the body in terms of fundamental levels of organization that increase in complexity, such as (from smallest to largest): chemicals, cells, tissues, organs, organ systems, and an organism.

Levels of Structural Organization of the Human Body: *The organization of the body often is discussed in terms of six distinct levels of increasing complexity, from the smallest chemical building blocks to a unique human organism*

The Levels of Organization

To study the chemical level of organization, scientists consider the simplest building blocks of matter: subatomic particles, atoms and molecules. All matter in the universe is composed of one or more unique pure substances called elements. Examples

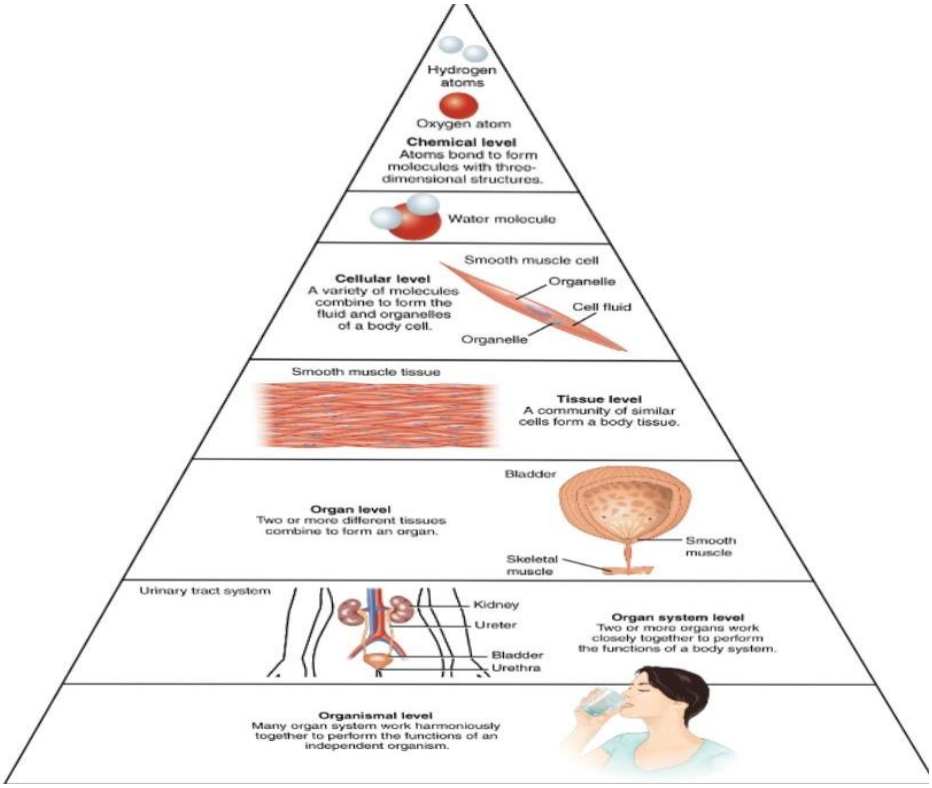
of these elements are hydrogen, oxygen, carbonu, nitrogen, calcium, and iron. The smallest unit of any of these pure substances (elements) is an atom. Atoms are made up of subatomic particles such as the proton, electron and neutron. Two or more atoms combine to form a molecule, such as the water molecules, proteins, and sugars found in living things. Molecules are the chemical building blocks of all body structures.

A **cell** is the smallest independently functioning unit of a living organism. Single celled organisms, like bacteria, are extremely small, independently-living organisms with a cellular structure. Humans are multicellular organisms with independent cells working in concert together. Each bacterium is a single cell. All living structures of human anatomy contain cells, and almost all functions of human physiology are performed in cells or are initiated by cells.

A human cell typically consists of flexible membranes that enclose cytoplasm, a water-based cellular fluid, with a variety of tiny functioning units called organelles. In humans, as in all organisms, cells perform all functions of life.

A **tissue** is a group of many similar cells (though sometimes composed of a few related types) that work together to perform a specific function. An organ is an anatomically distinct

structure of the body composed of two or more tissue types. Each organ performs one or more specific physiological functions. An organ system is a group of organs that work together to perform major functions or meet physiological needs of the body.



(B) Write difference between negative and positive feedback mechanism.

Ans:-

Difference between Positive and Negative Feedback

1.Frequency of Positive and Negative Feedback

As compared to positive feedback, negative feedback occurs more frequently among the body's homeostatic mechanisms as many diseases is caused by the disruption of the original systemic state. It is then more familiar while positive feedback is less observed as it is less intuitive.

2.Mechanism involved in Positive and Negative Feedback

The mechanism of positive feedback supports a higher rate of production or process as an action likewise increases. Thus, the result of a reaction is magnified. On the other hand, negative feedback inhibits the rate as a certain state is enhanced. Hence, the result of a reaction is inhibited.

3.Stability of Positive and Negative Feedback

As compared to positive feedback, negative feedback is more closely associated with stability as it lessens the effects of agitations. On the contrary, positive feedback supports exponential growth which may lean towards instability.

4.Change in Positive and Negative Feedback

Negative feedback generally resists changes as it makes adjustments to bring back the system to its original state. On

the other hand, positive feedback usually supports change as a small effect is enhanced.

5.Range of Positive and Negative Feedback

As compared to negative feedback, positive feedback has a wider range as the process rate could get exponentially multiplied. Similarly, the range is reflected when positive feedback results to more products such as more hormones, platelets, and the like. On the contrary, negative feedback leads to less products.

6.Vicious Cycle in Positive and Negative Feedback

Since positive feedback amplifies the disturbance, it is related with vicious cycles which could even lead to death. For instance, a positive feedback loop occurs during fever which continually fires up metabolic changes. A vicious cycle is also observed when an inflammation leads to more damage which likewise causes inflammation. However, negative feedback is most often associated with maintaining good health by restoring homeostasis.

7.External Interruption in Positive and Negative Feedback

A positive feedback often requires an external interruption for its mechanism to stop whereas a negative feedback merely

stops on its own when the original state is actualized. For example, numerous positive feedback mechanisms occur during a progressive circulatory shock. This is characterized by declining blood pressure that can lead to heart failure. In this case, medical intervention is needed for the positive feedback to stop.

Q 2: (A) What is cell organelles?

Ans:- An organelle (think of it as a cell's internal organ) is a membrane bound structure found within a cell. Just like cells have membranes to hold everything in, these mini-organs are also bound in a double layer of phospholipids to insulate their little compartments within the larger cells.

(B) Write down detail of any four of cell organelles.

Ans:- 1. **Nucleus** the nucleus is a large organelle that stores the cell's DNA (deoxyribonucleic acid). The nucleus controls all of the cell's activities, such as growth and metabolism, using the DNA's genetic information. Within the nucleus is a smaller structure called the nucleolus, which houses the RNA (ribonucleic acid). RNA helps convey the DNA's orders to the rest of the cell and serves as a template for protein synthesis.

2.Ribosmes:- Ribosomes are the protein factories of the cell. Composed of two subunits, they can be found floating freely in the cell's cytoplasm or embedded within the endoplasmic reticulum. Using the templates and instructions provided by two different types of RNA, ribosomes synthesize a variety of proteins that are essential to the survival of the cell.

3.Endoplsmic reticulum:- The endoplasmic reticulum (ER) is a membranous organelle that shares part of its membrane with that of the nucleus. Some portions of the ER, known as the rough ER, are studded with ribosomes and are involved with protein manufacture. The rest of the

organelle is referred to as the smooth ER and serves to produce vital lipids (fats).

4.Golgi apparatus:- If the proteins from the rough ER require further modification, they are transported to the Golgi apparatus (or Golgi complex). Like the ER, the Golgi apparatus is composed of folded membranes. It searches the protein's amino acid sequences for specialized "codes" and modifies them accordingly. These processed proteins are then stored in the Golgi or packed in vesicles to be shipped elsewhere in the cell.

Q3: (A) Write down physiology of digestion.

Ans:- Digestion is the process of mechanically and enzymatically breaking down food into substances for absorption into the bloodstream. Food contains three macronutrients that require digestion before they can be absorbed: fats, carbohydrates, and proteins. Through the process of digestion, these macronutrients are broken down into molecules that can traverse the intestinal epithelium and enter the bloodstream for use in the body. Digestion is a form of catabolism or breaking down of substances, that involves two separate processes: mechanical digestion and chemical digestion. Mechanical digestion involves physically breaking down food substances into smaller particles to more efficiently undergo chemical digestion. The role of chemical digestion is to further degrade the molecular structure of the ingested compounds by digestive enzymes into a form that is absorbable into the bloodstream. Effective digestion involves both of these processes, and defects in either mechanical digestion or chemical digestion can lead to nutritional deficiencies and gastrointestinal pathologies.