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

Six level of organization

- 1- Chemical level
- 2- Cellular level
- 3- Tissue level
- 4- Organ level
- 5- System level
- 6- Organismal level.

1- **Chemical level**  
Basic level

Atoms :- The smallest unit of matter  
- Essential atoms for life include carbon (C), hydrogen (H), oxygen (O)

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Nitrogen (N) phosphorus (P) calcium (Ca)  
and sulfur

Molecules :- Two or more atoms  
joined together.

- Deoxyribonucleic acid (DNA)
- Glucose

### 2- Cellular level

Molecules combine to form cells

Cell:- are the basic structural  
and functional units of an organism

→ Many kinds of cell in the body

→ Muscle cells, Nerve cells, epithelial  
cells etc.

### 3- Tissue level Organ level.

Tissues are joined together to  
form organs

• Organs :- are structures that  
composed of two or more different  
types of tissues.

→ specific function and recognizable  
shape

## Examples

→ Heart, lungs, kidneys

→ Stomach is made of several tissues

→ serous membrane, smooth muscle, and epithelial layers for digestion

## 4. System level

A system consists of related organs with a common function.

→ organ-system level

Digestive system breaks down and absorbs food.

→ it includes organs such as the mouth, small and large intestines, liver, gallbladder, and pancreas.

## 5. Tissue level

Tissues are groups of cells and materials surrounding them.

Four basic types of tissues:

→ Epithelial

→ Connective

→ Muscular

→ Nervous

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## Organismal level

All parts and systems of the body functioning together.

Example :- Human.

B) Write different between negative & positive feedback mechanism.

1. Negative Feedback systems

2. Positive Feedback systems.

1. Negative Feedback Systems

→ Reverses a change in a controlled condition

→ Regulation of blood pressure (force exerted by blood as it presses against the walls of the blood vessels)

2. Positive Feedback systems

→ strengthen or reinforce a change in one of the Normal child birth.

## Difference

Positive vs Negative Feedback The key difference between positive and negative feedback is their response to

to change positive feedback amplifies change while negative feedback reduces change. This means that positive feedback will result in more of product; more apples, more contractions or more clotting platelets.

Q2:- What is cell organelles?

A:- In cell biology, an organelle is a specialized subunit, usually within a cell, that has a specific function. The name organelle comes from the idea that these structures are parts of cells, as organs are to the body, hence organelle, the suffix -elle being a diminutive.

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 double layer of phospholipids to insulate their little compartments within the larger cells.

## Function

The cytoplasm is a fluid matrix that usually surrounds the nucleus and is bound by outer membrane of the cell. organelles are small structures within the cytoplasm that carry out functions necessary to maintain homeostasis in the cell.

B) Write down detail of any four of cell organelles,

Cell organelle is a specialized entity present inside a particular type of cell that performs a specific function.

### Four Cell organelles

#### 1 Endoplasmic Reticulum (ER)

Endoplasmic Reticulum (ER) is present as an interconnection of tubules that are connected to the nuclear membrane in eukaryotic cells.

→ There are two types of ER based on the presence or absence of ribosomes on them.

• Rough ER (RER) with ribosomes attached on the cytosolic face of Endoplasmic Reticulum and thus is involved in protein synthesis.

- Smooth ER (SER) which lacks ribosomes and has a function during lipid synthesis.

## Function

- ER contains many of the enzymes required for several metabolic processes, and the surface of the ER is essential for other operations like diffusion, osmosis, and active transport.

- one of the crucial function of ER is the synthesis of lipids like cholesterol and steroids.

### a) Golgi Apparatus

The Golgi Apparatus is the cell organelle mostly present in eukaryotic cells which is responsible for the packaging of macromolecules into vesicles so that they can be sent out to their site of action.

## Function

Golgi complex has an essential purpose of directing proteins and lipids to their destination and thus, act as the traffic police of the cell.

3- Mitochondria  
 Mitochondria are double membrane bound cell organelles responsible for the supply and storage of energy for the cell.

The oxidation of various substrates in the cell to release energy in the form of ATP is the primary purpose of mitochondria.

Function

The primary function of mitochondria is the synthesis of energy in the form of ATP required for the proper function of the cell organelles.

Mitochondria also help in balancing the amount of  $Ca^{+}$  ions within the cell and assists the process of apoptosis.

4- Nucleus

The nucleus is double membrane bound structure responsible for controlling cellular activities as well as a center for genetic materials, and its transporing. It is one of the large cell organelles occupying 10% of total space in the cell.



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A nucleus is clearly defined in the case of a eukaryotic cell, however it is absent in prokaryotic organisms with the genetic material distributed in the cytoplasm.

## Function

The nucleus is responsible for storage as well as the transport of genetic material in the form of DNA or RNA.

Q3. Write down physiology of digestion?

- Digestion is the process of mechanically and enzymatically breaking down food into substances for absorption into 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.

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Digestion is Form of catabolism or breaking down of substance, that involves two separate processes:

- 1) Mechanical digestion
- 2) Chemical digestion

### 1) Mechanical digestion

Mechanical digestion involves physically breaking down food substances into smaller particles so more efficiently undergo chemical digestion

### 2) Chemical digestion

The role of chemical digestion is to further degrade to molecular structure of 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.

# Organ Systems involved

## Gastrointestinal System

- oral cavity
- Stomach
- small intestine
- Liver
- Gall bladder
- Pancreas

## Function

Digestion is a process that converts nutrients in ingested food into forms that can be absorbed by the gastrointestinal tract. proper digestion requires both mechanical and chemical digestion and occurs in the oral cavity, stomach, and small intestine. Additionally, digestion requires the secretions from accessory digestive organs such as the pancreas, liver, and gallbladder.

The oral cavity, stomach, and small intestine function as three separate digestive compartments with differing chemical environments.

The mouth is the beginning of the digestive tract.

Chewing breaks the food into pieces that are more easily digested, while saliva mixes with food to begin the process of breaking it down into a form your body can absorb and use. From pharynx food travels to the esophagus or swallowing tube. By means of a series of contractions called peristalsis the esophagus delivers food to the stomach.

The lower esophagus sphincter keeps food from passing backwards into the esophagus.

The stomach secretes acids and powerful enzymes that continue the process of breaking down the food. When it leaves the stomach, food is the consistency of a liquid or paste. From there the food moves to the small intestine. The small intestine continues the process of breaking down food by using enzymes released by the pancreas and bile from the liver.

Bile is a compound that aids in the digestion of fat and eliminates waste products.