

Mid-Term Assignment

Course Title :Human PhysiologyI

DT plus Rad1

St semester

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Marks:30

Note:

☒ Attempt all questions, all questions carry equal marks.

☒ Answer Briefly and to the point, avoid unnecessary details

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

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

Q2:(A) What are cell organelles?

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

Q3:(A) Write down physiology of digestion.

Ans1:

Part A:

Six Levels Of Organization:

i. Atom:

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.

ii. Cell:

cell is the smallest independently functioning unit of a living organism. Even bacteria, which are extremely small, independently-living organisms, have a cellular structure. 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.

iii. Tissue:

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.

iv. Organ:

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.

v. Organ system:

An organ system is a group of organs that work together to perform major functions or meet physiological needs of the body.

Vi. Organism:

The organism level is the highest level of organization. An organism is a living being that has a cellular structure and that can independently perform all physiologic functions necessary for life. In multicellular organisms, including humans, all cells, tissues, organs, and organ

systems of the body work together to maintain the life and health of the organism.

Part b:

Difference between Positive and Negative Feedback

- 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.

- 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.

1. 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.

1. 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.

1. 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.

Ans 2:

Part a:

Cell Organelle:

- Cell organelle is a specialized entity present inside a particular type of cell that performs a specific function.
- There are various cell organelles, out of which, some are common in most types of cells like cell membranes, nucleus, and cytoplasm. However, some organelles are specific to one particular type of cell-like plastids and cell walls in plant cells.

Part b:

Ribosomes:

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.

Endoplasmic 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).

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.

Chloroplasts

In plants and some algae, organelles known as [chloroplasts](#) serve as the site of photosynthesis. Chloroplasts contain a pigment known as chlorophyll, which captures the sun's energy to transform water and carbon dioxide into glucose for food. Chloroplasts allow autotrophic organisms to meet their energy needs without consuming other organisms.

Ans 3:

Physiology Of Digestion:

Introduction:

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.

Explanation:

- 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.
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