UNIT: 18 ORGANISATION OF LIFE

CLASS: VIII

SUBJECT: SCIENCE

I. Choose the best answer.

1. _____ is tough and thick white sheath that protects the inner parts of the eye.
   a) Sclera b) Conjunctiva c) Cornea d) Iris
2. _____ cells are specialised cells that can be transformed into any kind of cells.
   a) Nerve **b) Stem** c) Heart d) Bone
3. Maintenance of constant internal environment of the body is known as_____.
   a) homeostasis b) homeophytes c) homeokinesis d) homeophilics
4. In the absence of oxygen, glucose is broken down in to _____.
   a) lactic acid b) citric acid c) acetic acid d) nitric acid
5. The process of air passing in and out the lungs is called _____.
   a) inhalation b) exhalation **c) breathing** d) None of these
6. Osmosis is the movement of water molecules from _____.
   a) higher concentration to a region of lower concentration.
   b) lower concentration to a region of higher concentration.
   c) Both of these d) None of these
7. The erythrocyte is placed in _____ solution which has lesser concentration of solutes and greater concentration of water than in the cytoplasm.
   a) hypotonic b) hypertonic c) neutral d) acidic

II. Fill in the blanks.

1. **Cell** is the structural and functional unit of living organisms.
2. The largest cell is egg of an **Ostrich**
3. **Fermentation** is a good example for anaerobic respiration.
4. **Optic** nerve is located at the end of the eyes behind the retina.
5. The size of the cells are measured in units of **Microns**.

III. Match the following.

1. Carbohydrates	-	Glucose
2. Glucose	-	CO_2, Water and Heat
3. Protein	-	Amino acid
4. Amino acids	-	Enzymes, hormone, protein
5. Fatty acids	-	Cholesterol and other steroid

IV. State true or false. If false, correct the statement.

1) In hypotonic condition, concentration of the external and the internal solution of the organism are same. **False**

2) Diffusion is the movement of particles from an area of lower concentration to higher concentration. **False**

3) Human beings are warm blooded in nature. **True**

4) The larynx has fold of tissue which vibrate with the passage of air to produce sound. **True**

5) Aqueous humour plays an important role in maintaining the shape of the eye. **True**

V. Answer very briefly.

1. What is cell differentiation?

Our body is developed from a single cell called zygote. The zygote undergoes continuous mitotic division and forms the foetus consisting multitude of cells of different shape, size and content. Foetal cells gradually attain change in structure and function. This process is known as cell differentiation.

2. State different types of tissues.

Depending on the basis of their structure and function, tissues can be classified into four types:

1. **Epithelial** (Covering) tissue for protection.
2. **Muscular** (Contractile) tissue for movements and locomotion.
3. **Connective** (Supporting) tissue for binding different structures of body.
4. **Nervous** tissue for conduction of nerve impulses. All the complex organisms consist of only four basic types of tissues.

3. Mention the function of 'Alveoli'.

Alveoli are tiny air sacs in the lungs that are located at the end of bronchial tubes, which is microscopic in nature. It is meant for them exchange of oxygen and carbon dioxide.

4. Name the processes by which air enters and comes out of our lungs.

Inspiration (Inhalation)

The process of taking air into the lungs is called **inspiration** or inhalation. The process of expelling air from the lungs is called **expiration or exhalation.**

5. Differentiate osmoconformers and osmoregulators.

Osmoconformers	Osmoregulators
These organisms try to maintain the osmolality of their body matching with their surroundings. Most of the invertebrates, marine organisms are osmoconformers.	These organisms maintain their internal osmolality, which can be extremely different from that of the surrounding environment, through physiological processes

6. Define - Metabolism.

Metabolism is the sum of chemical reactions by which living organisms sustain their life. Metabolism consists of anabolism (the buildup of substances) and catabolism (the breakdown of substances).

VI. Answer briefly.

1. Define - Prokaryotic cell.

In some organisms like bacteria, cyanobacteria and mycoplasma, the true nucleus is absent. These organisms are called prokaryotes.

2. Tabulate the differences between aerobic and anaerobic respiration.

Aerobic	Anaerobic
Aerobic respiration takes place in the presence of oxygen.	Anaerobic respiration takes place in the absence of oxygen.
The end products of aerobic of	The end products of anaerobic

respiration are carbon dioxide and water.	respiration are CO_2 and ethanol or lactic acid.
Common in all higher plants and animals.	Common in certain micro organisms and human muscle cell.

3. Why the human eye is compared with camera?

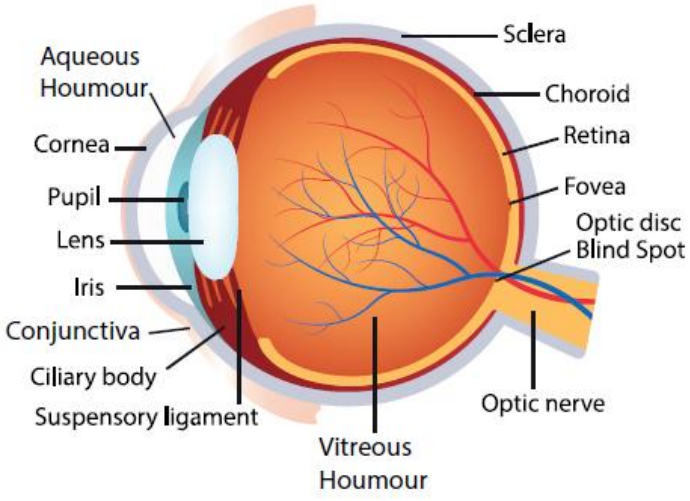
The human eye can be compared to a camera as both functions by gathering, focusing, and transmitting the light through the lens for creating an image of an object.

4. Which organ and organ system help to maintain homeostasis?

- Homeostasis is a property of human biological system where the **self-regulating** process tends to maintain the balance for the survival.
- Behavioural and physiological responses are the two important regulating mechanisms that maintain the stability of homeostasis.
- All the processes of integration and coordination of function are mediated by nervous and hormonal system.
- The liver, kidney, and brain (hypothalamus), autonomic nervous system and the endocrine system help to maintain homeostasis.

VII. Answer in detail.

1. Draw the structure of human eye and label its parts.



2. Explain osmosis with an example.

Osmosis:

Osmosis is the movement of solvent particles across a semipermeable membrane from a dilute solution into a concentrated solution.

The solvent moves to dilute the concentrated solution and equalize the concentration on both sides of the membrane.

The movement of liquids in and out of cells is dependent on the concentration of the solution surrounding it. There are three types of situations in which this could vary.

Isotonic:

Here the concentration of external and internal solution of the organism are the same.

Hypotonic:

Here the external solution concentration is less compared to the concentration of the inner solution of an organism. In this case water will rush into the organism.

Hypertonic:

Here the external solution concentration is greater than the concentration of the inner solution of an organism. In this case the water will rush out of the organism.

3. Differentiate between inhalation and exhalation.

Inhalation	Exhalation
The muscles of the diaphragm contract	The Muscles of the diaphragm relax.
The diaphragm goes downward	The diaphragm goes upward
The ribs move upwards and outwards	The ribs move downwards
The volume of thoracic (chest) cavity increases	The volume of thoracic (chest) cavity decreases
Air enters the lungs through the nose	Air goes out of the lungs through the nose.

4. List out the different types of metabolism with an example.

Metabolism

Metabolism is the sum of chemical reactions by which living organisms sustain their life. Metabolism consists of anabolism (the buildup of substances) and catabolism (the breakdown of substances).

a. Anabolism

Anabolism or constructive metabolism, is all about building and storing. It supports the growth of new cells, the maintenance of body tissues, and the storage of energy for use in the future. During anabolism, small molecules are changed into larger, more complex molecules of carbohydrate, protein, and fat.

Example:

Glucose ⟶ Glycogen and other sugars

Amino acids ⟶ Enzymes, hormones, proteins

Fatty acids ⟶ Cholesterol and other steroids

b. Catabolism

Catabolism or destructive metabolism, is the process that produces the energy required for all activity in the cells. In this process, cells break down large molecules (mostly carbohydrates and fats) to release energy. This energy release provides fuel for anabolism, heats the body, and enables the muscles to contract and the body to move.

Example

Carbohydrates ⟶ Glucose

Glucose ⟶ CO_2, Water and Heat

Protein ⟶ Amino acid

5. Explain the mechanism of breathing.

Inspiration (Inhalation)

- The process of taking air into the lungs is called **inspiration** or inhalation. During inspiration, the sternum is pushed up and outward and the diaphragm is pulled down.

- This increases the volume of the thoracic cavity and thus the pressure decreases. The air outside the body flows into the lungs.
- Here exchange of gases takes place between the air and the blood.

Expiration (Exhalation)

- The process of expelling air from the lungs is called expiration or exhalation. Upon exhalation, the lungs recoil to force the air out of the lungs.
- The inter costal muscles relax, returning the chest wall to its original position.
- During exhalation, the diaphragm also relaxes, moving higher into the thoracic cavity. This increases the pressure within the thoracic cavity relative to the environment.
- Air rushes out of the lungs due to the pressure gradient. This movement of air out of the lungs is a passive event.

VIII. Higher Order Thinking Questions.

1. Why do we need instant energy? Does glucose give that energy? Explain.

- Energy is needed for performing day to day activities of the body which is got through intake of food. This provides energy for all organ systems.
- Instant energy may be required in cases of extended physical activities like running or physical ailments like tiredness or giddiness.
- Glucose is the simplest form of carbohydrate. Intake of glucose help it to solubilise in the blood immediately, and is carried to organs of the body thus helping to provide instant energy digestion of carbohydrates also converts it to glucose finally.

2. How are we preparing pickles? What are the steps involved in that?

- Pickles are prepared usually by addition of excess salt. The salty solution creates a high concentration (hypertonic) in the external medium of the vegetable / fruit which is used for making pickles.
- Therefore water comes out of the vegetable and it undergoes plasmolysis and begins to shrink.
- Thus when water content is lost the pickle is able to retain its shelf life for a longer period.

IX. Value based questions.

1. Dr. Usha is a pulmonologist (Doctor for respiratory diseases). One day, a school student named Arjun, met her with respiratory problems. After diagnosis, the doctor advised him to go to playground daily and play football or basketball. She also advised him to do pranayamam in the morning.

a) Why did the doctor advise him to go to the playground?

b) What is the use of pranayamam?

- ❖ Playing is a good physical activity which helps to improve breathing and blood circulation in the body. It also helps to relieve anxiety.
- ❖ Pranayamam teaches us the proper way of breathing, slowly and deeply.
- ❖ It increases the capacity of the lungs and brings more oxygen into the body.
- ❖ It is especially very useful when one has respiratory problems and the breathing is irregular and unsteady. It improves blood circulation.

2. Explain why you are not able to breathe normally when you are in closed and crowded places?

In a closed and crowded place, the number of people are more. All of them breathe out carbon dioxide.

Therefore the amount of CO_2 in the air is much more than the amount of oxygen available for inhalation.

Therefore we find it difficult to breathe in a closed and crowded place.

3. Shylesh is a school going kid studying standard VIII. He is crazy about playing video games in mobile phones. After couple of months, his eyes turned red and he felt severe pain in his eyes. His science teacher enquired about this and advised his parents to take him to an eye doctor.

i) Impact of excessive usage of mobile phones:

1. Cell phone radiation can damage eyes and cause early cataract.
2. It can also lead to cataract in lens apart from affecting retina, cornea etc.
3. It strains the eye muscles.

4. It also caused temporary problems like dry and itchy eyes, blurry vision, pain in eyes etc.

(ii) The teacher has shown values of:

1. Empathy
2. Responsibility
3. Personal care.