4. LIFE ON EARTH

Improve your learning (Page 58-59)

1) Examples of Living and Non-living Things in Surroundings

Living Things: Humans, dogs, cats, birds, insects, trees, grass, flowers, bacteria, fungi.

Non-living Things: Table, chair, car, book, pen, rock, water, air, house, phone.

2) Common Features of Living and Non-living Things

Both living and non-living things share the following physical properties:

Mass: Both have weight.

Shape: Both have a definite shape (though some living things, like amoebas, can change shape).

Occupy Space: Both take up space in the environment.

3) Characteristic Features of Living and non-living Things

Living Things:

Growth: Increase in size or number of cells (e.g., a plant growing taller).

Reproduction: Ability to produce new organisms (e.g., humans having babies).

Response to Stimuli: React to environmental changes (e.g., plants bending toward light).

Respiration: Use oxygen to release energy (e.g., humans breathing).

Nutrition: Obtain and use food for energy (e.g., animals eating, plants photosynthesizing).

Excretion: Remove waste from the body (e.g., sweating in humans).

Movement: Some form of locomotion or internal movement (e.g., animals walking, plant leaves turning).

non-living Things:

Lack growth, reproduction, respiration, and response to stimuli.

May have mass, shape, and occupy space but do not perform life processes.

Examples: Rocks, tables, and cars remain static unless acted upon externally.

4) Why Are Plants Called Autotrophs?

Plants are called **autotrophs** because they produce their own food through **photosynthesis**. They use sunlight, carbon dioxide (CO2), and water to synthesize glucose (food) in the presence of chlorophyll, releasing oxygen as a byproduct. This self-sustaining process distinguishes them from heterotrophs, which rely on other organisms for food.

5) Example of Plants Showing Response to Stimuli

Plants respond to external stimuli, a characteristic of living things. An example is the **touch-me-not plant (Mimosa pudica)**, which closes its leaves when touched. This rapid response to physical touch (a stimulus) demonstrates sensitivity to the environment, a process called **thigmotropism**.

6) Differences Between Living and non-living Things

Feature	**Living Things**	**non-living Things**
Growth	Grow through cell division (e.g., humans, plants).	Do not grow (e.g., rocks remain static).
Reproduction	Reproduce to produce offspring (e.g., animals, seeds).	Cannot reproduce (e.g., tables).
Response to Stimuli	Respond to changes (e.g., plants bend to light).	No response (e.g., a chair doesn't react).
Respiration	Use oxygen to release energy (e.g., breathing).	No respiration (e.g., cars don't breathe).
Nutrition	Require food for energy (e.g., eating, photosynthesis).	No need for food (e.g., stones).
Excretion	Remove waste (e.g., sweating, urination).	No waste removal (e.g., pens).

Feature	Living Things	non-living Things
Lifespan	Have a definite lifespan (e.g., humans live ~70 years).	No lifespan (e.g., rocks exist indefinitely).

7) Different Living Things Have Different Lifespans

Yes, different living things have varying lifespans depending on their species. Examples:

Mayfly: ~1 day (shortest lifespan among insects).

Housefly: ~1 month.

Dog: ~10–15 years.

Human: ~70–80 years.

Elephant: ~60–70 years.

Tortoise: ~100–150 years.

Bristlecone Pine (tree): ~5,000 years (one of the longest-living organisms).

8) Agreement with Rani's Statement About Microorganisms

Yes, I agree with Rani's statement. There are many organisms that cannot be seen with the naked eye, called **microorganisms**. These include:

Bacteria: Single-celled organisms (e.g., *Escherichia coli* in the gut).

Fungi: Such as yeast used in baking.

Protozoa: Like *Amoeba* found in freshwater.

Algae: Microscopic plants in water. **Example**: *Bacteria* in yogurt are living organisms that aid digestion but are invisible without a microscope.

9) Differences Between Autotrophs and Heterotrophs

Feature	Autotrophs	Heterotrophs
Definition	Organisms that produce their own food.	Organisms that depend on others for food.

Feature	Autotrophs	Heterotrophs
Food Source	Use sunlight or chemicals (e.g., photosynthesis).	Consume other organisms or organic matter.
Examples	Plants, algae, some bacteria (e.g., cyanobacteria).	Animals, fungi, most bacteria, humans.
Process	Photosynthesis or chemosynthesis.	Ingestion, absorption, or decomposition.

10) Comparison of Modes of Reproduction in Plants and Animals

Feature	Plants	Animals
Sexual Reproduction	Involves flowers, pollen, and seeds (e.g., pollination in mango trees).	Involves gametes (sperm and egg) leading to offspring (e.g., humans, dogs).
Asexual Reproduction	Occurs via runners, bulbs, cuttings (e.g., potato tubers, strawberry runners).	Less common, but occurs in some (e.g., budding in hydra, cloning in starfish).
Reproductive Organs	Flowers (stamen, pistil) for sexual reproduction.	Specialized organs like testes, ovaries.
Dispersal	Seeds dispersed by wind, water, animals.	Offspring often born live or as eggs.
Examples	Mango (sexual), potato (asexual).	Human (sexual), hydra (asexual).

Multiple Choice Questions

1) Living and non-living things are similar in possessing
Answer: **D. All**
Explanation: Both living and non-living things have mass, shape, and occupy space.

2) During photosynthesis, plants take in
Answer: **B. CO2**
Explanation: Plants absorb carbon dioxide (CO2) and release oxygen during photosynthesis.

3) Which of the following characteristics externally appears in living things?
Answer: **C. Growth**
Explanation: Growth is visible externally (e.g., a plant getting taller), while respiration, digestion, and photosynthesis are internal processes.

4) New organisms are formed by the following process
Answer: **D. Reproduction**
Explanation: Reproduction is the process by which new organisms are created.

5) Hydra and Sea anemone acquires the food with the help of
Answer: **C. Tentacles**
Explanation: Hydra and sea anemones use tentacles to capture prey.

6) During respiration which gas is inhaled
Answer: **A. O2**
Explanation: Oxygen (O2) is inhaled during respiration to produce energy.

7) Which of the following is not a unicellular organism
Answer: **D. Cat**
Explanation: A cat is a multicellular organism, while amoeba, bacteria, and yeast are unicellular.

8) An example of fungi
Answer: **A. Yeast**
Explanation: Yeast is a type of fungi, while amoeba, plasmodium, and bacteria are not.

Fill in the Blanks

9) Cell is the structural unit of a living organism.

10) Life span of an elephant is **60–70 years**.

11) Birds start their life cycle with **eggs**.

12) Living things acquire food by the process of **nutrition**.

13) Removal of waste particles from the body is called **excretion**.

14) Mimosa pudica is the scientific name of the touch-me-not plant.

15) Stem grows towards sunlight. It is an example for **phototropism**.

16) Response to stimuli is absent in **non-living things**.

Match the Following

17) Column A and Column B

i) Plants → d) Autotrophs

ii) Animals → c) Heterotrophs

iii) Living things → b) Reproduction

iv) Stomata → a) Exchange of gases

Answer: **A. i-d, ii-c, iii-b, iv-a**

18) Column A and Column B

i) Roots → b) Geotrophic movement

ii) Stem → d) Phototrophic movement

iii) Botany → a) Plants

iv) Zoology → c) Animals

Answer: **D. i-b, ii-d, iii-a, iv-c**