St. Andrews Scots Sr. Sec. School

9th Avenue, I.P. Extension, Patparganj, Delhi – 110092
Class VIII (Session: 2026-2027)
Answer Key

Subject: Science **Chapter: The Invisible Living World: Beyond Our Naked Eye**

Self-Assessment:

A. Multiple Choice Questions:

1. (a) 2. (b)

B. Think and Answer:

1. Most life activities take place in the cytoplasm because it contains many cell organelles and enzymes that carry out vital chemical reactions necessary for the cell's survival.

2. Without microscopes, we would not have discovered microorganisms, cells or their functions. Our understanding of diseases, health and how living organisms work would be very limited.

Self-Assessment:

Fill in the blanks:

1. chlorophyll, chloroplasts, photosynthesis 2. starch, proteins, fats 3. large, shape

4. biconcave, surface area 5. Nerve

Self-Assessment:

Oral Questions: **(Page No. 19)**

1. The cell is called the basic structural and functional unit of life because all living organisms are made up of cells and all life processes occur within them.

2. A group of similar cells forms a tissue.

EXERCISE SECTION-A

A. Oral Questions:

1. The cell is called the basic structural and functional unit of life because all living organisms are made up of cells and all life processes take place within them.

2. Chlorophyll in chloroplasts traps sunlight and helps the plant make food through photosynthesis.

3. Amoeba and Paramecium are two microorganisms that can be seen in pond water under a microscope.

B. Multiple Choice Questions: Tick (√) the correct options:

1. (b) 2. (b) C. 3. (b)

Assertion-Reason Based Questions:

1. (a)

2. (d) Explanation: The assertion is false because animal cells do not have large central vacuoles; instead, they have small and many vacuoles. The reason is true, as in plant cells, vacuoles are large and help maintain the cell's shape and store substances, while in animal cells, they are smaller and more numerous.

D. Case-Based Questions:

Case 1:

1. Lactobacillus bacterium is responsible for changing milk into curd.

2. The bowl was kept in a warm place because warmth helps bacteria multiply faster and speed up the curdling process.

3. Milk changes into thick, tangy curd because bacteria convert milk sugar (lactose) into lactic acid, which thickens and sours the milk.

Case 2:

1. The four main groups of microorganisms they identified are bacteria, fungi, protozoa and algae.

2. They could not see these organisms with the unaided eye because microorganisms are extremely small and can only be viewed through a microscope.

3. Protozoa are animal-like microorganisms that cannot make their own food, whereas algae are plant-like and contain chlorophyll to prepare their food through photosynthesis.

SECTION-B

A. Very Short Answer Questions:

1. Robert Hooke and Antonie van Leeuwenhoek.

2. Red blood cell.

3. Amoeba (unicellular) and Rhizopus (multicellular).

B. Short Answer Questions:

1. An onion peel cell has a cell wall and a regular shape, while a cheek cell lacks a cell wall and has an irregular shape.

2. Farmers grow legumes because they have Rhizobium bacteria in their root nodules that fix nitrogen, improving soil fertility.

3. Microorganisms decompose dead plants and animals, recycling nutrients and cleaning the environment.

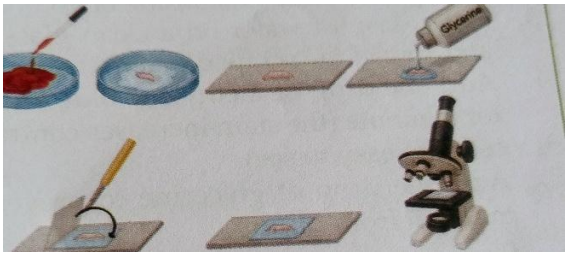
C. Long Answer Questions:

1. **Materials required**

Onion, Safranin, Glycerine, Compound microscope. Slides, Coverslips, forceps etc.

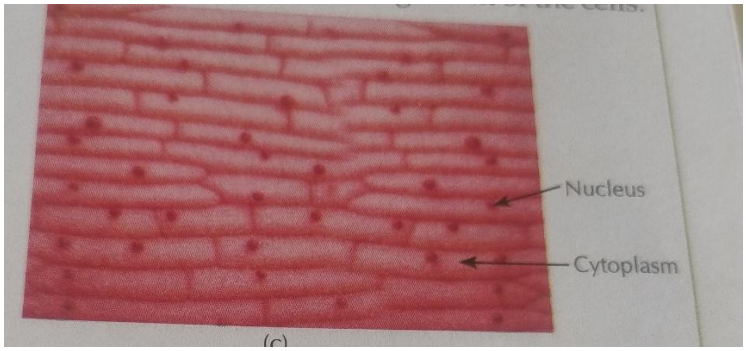
Procedure

1. For the **onion peel experiment**, cut an onion into two halves and remove a transparent membranous structure which is known as epidermal peel.
2. Take the peel with the help of a forceps in a watch glass containing water.
3. Add a few drops of safranin and let it stand for staining.
4. Wash the peel with water to remove extra stain
5. Transfer the peel on a glass slide with a brush.
6. Add a drop of glycerine over the peel and place the coverslip gently.
7. Remove extra stain/ glycerine with a blotting paper.
8. Observe the **onion peel under microscope**.



Observations

- Red coloured cells with prominent colour on the periphery were observed.
- Rectangular cells with thin cytoplasm are present enclosed within the cell wall.
- Vacuole is large and centrally placed.
- Nucleus is round in shape, deeply stained and present in each cell close to the periphery.



Structure of onion peel under the microscope

Conclusion

The **onion peel cell** contains a large vacuole, prominent nucleus, thin cytoplasm and rectangular cells with a cell wall. Therefore, we can conclude that the above **onion peel cell** is a type of plant cell.

2. In plant cells, the large central vacuole stores food and waste and maintains shape; in animal cells, small vacuoles store materials temporarily and help remove waste.

3. Microalgae produce oxygen, absorb carbon dioxide and are used as food, biofuel and in medicines, helping maintain ecological balance.

4. A muscle cell is long and spindle-shaped for movement, a nerve cell is long and branched to transmit messages and a red blood cell is biconcave to carry oxygen efficiently.

D. Application-Based Questions:

1. During winter, the bowl of milk is wrapped in a cloth to keep it warm because warmth helps Lactobacillus bacteria multiply faster, converting milk into curd.

2. Microorganisms such as Methano bacterium decompose organic waste in a biogas plant to produce biogas. This gas is used as fuel and the leftover slurry is used as manure, benefiting villagers economically and environmentally.

E. Picture-Based Questions:

1. (b) The onion peel cell has a cell wall.

2. (a) Rhizobium bacteria.

(b) It fixes atmospheric nitrogen into the soil, improving soil fertility.

F. Life Skills:

1. Spoilt bread or curd should not be eaten because harmful microbes grow on them and can cause food poisoning or illness.

2. Encourage people to keep separate bins for biodegradable and plastic waste, explain how composting helps and organise awareness drives about reducing plastic use and supporting recycling.