

SCIENCE
WORKSHEET_070526
CHAPTER 02 THE INVISIBLE LIVING WORLD: BEYOND OUR NAKED EYE
(ANSWERS)

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : VIII

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A student observes a microorganism from a pond water sample under a microscope. The student notes that the organism is green and moves using specialized structures. Based on the description in the textbook, which category of microorganism is the student most likely observing?.

(a) Amoeba (b) Fungi (c) Algae (d) Bacteria

Ans. (c) Algae

The text states that some algae are single-celled, look green due to chlorophyll, and can move using specialized structures.

2. Which of the following statements about plant and animal cells is correct, based on the chapter?

(a) Both plant and animal cells have a cell wall.
(b) Animal cells have a large central vacuole, while plant cells do not.
(c) Plant cells have chloroplasts and a cell wall, which animal cells lack.
(d) Both plant and animal cells have plastids that store substances.

Ans. (c) Plant cells have chloroplasts and a cell wall, which animal cells lack.

The plant cells have an extra outer layer called a cell wall and that some plastids, like chloroplasts, contain chlorophyll. It also states that animal cells do not typically have vacuoles, and if they do, they are small.

3. If a laboratory has only a foldscope, what is its primary limitation when studying microorganisms compared to a high-powered laboratory microscope?.

(a) It cannot be used to observe unicellular organisms.
(b) It does not provide the same level of detail as a high-powered microscope.
(c) It cannot be used to observe the nuclei of cells.
(d) It is not foldable and is difficult to transport.

Ans. (b) It does not provide the same level of detail as a high-powered microscope.

Foldscopes may not provide the same level of detail as high-powered laboratory microscopes, but they make the microscopic world accessible to many people.

4. A farmer observes that his crop yield is consistently low. Based on the chapter, which microorganism, when grown with his legume crops, can help improve the soil naturally without chemical fertilizers?

(a) Lactobacillus (b) Rhizobium (c) Bread mould (d) Yeast

Ans. (b) Rhizobium

Rhizobium bacteria live in the root nodules of legumes and trap nitrogen from the air, making it useful for plants and thus helping them grow better without chemical fertilizers.

5. A group of scientists is studying a newly discovered organism. They find that its cells are prokaryotic, meaning they lack a well-defined nucleus with a nuclear membrane. According to the textbook, which of the following is most likely this organism?

(a) Algae (b) Yeast (c) Protozoa (d) Bacteria

Ans. (d) Bacteria

Bacteria do not have a well-defined nucleus and a nuclear membrane; instead, they have a nucleoid, which distinguishes them from other cells like yeast, protozoa, and algae.

6. You have a piece of dough that you want to make soft and fluffy for baking. Based on the activity in the chapter, which ingredient is essential for this purpose and why?.

(a) Sugar, because it acts as a food source for the yeast to grow.
(b) Warm water, because it helps the yeast produce lactic acid.
(c) Yeast, because it releases carbon dioxide gas which forms bubbles.
(d) Salt, because it acts as a preservative and prevents the dough from going bad.

Ans. (c) Yeast, because it releases carbon dioxide gas which forms bubbles.

Yeast releases carbon dioxide during respiration, which forms bubbles that make the dough soft and fluffy.

7. Which of the following best describes the function of a cell wall in a plant cell?

(a) It controls the movement of substances in and out of the cell.
(b) It provides rigidity and strength to the plant.
(c) It contains chlorophyll for photosynthesis.
(d) It is the site where most life processes take place.

Ans. (b) It provides rigidity and strength to the plant.

"The cell wall in the plant cell provides rigidity and strength to plants."

8. Based on the levels of organization described in the chapter, what is the correct hierarchy from the simplest to the most complex level?

(a) Organ → Cell → Tissue → Organ System → Organism
(b) Organism → Organ System → Organ → Tissue → Cell
(c) Cell → Organ → Tissue → Organ System → Organism
(d) Cell → Tissue → Organ → Organ System → Organism

Ans. (d) Cell → Tissue → Organ → Organ System → Organism

The levels of organization in this order: "Cell → Tissue → Organ → Organ system → Organism".

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** The ostrich egg is considered the largest single cell in the living world.

Reason (R): All complex living organisms, whether plants or animals, begin their life as a single cell.

Ans. (b) Both A and R are true, but R is not the correct explanation of A.

Both statements are factually correct based on the text. The ostrich egg is the largest single cell, and complex life begins as a single cell. However, the reason R does not explain why the ostrich egg is so large. It is a general statement about the beginning of life, not a specific explanation for the ostrich egg's size.

10. Assertion (A): Robert Hooke's invention of a microscope, which could magnify objects 200 to 300 times, was a groundbreaking scientific discovery.

Reason (R): This tool enabled him to observe and name the basic unit of life, the 'cell', for the first time.

Ans. (a) Both A and R are true, and R is the correct explanation of A.

The invention of the microscope was groundbreaking because it allowed Robert Hooke to see and name the 'cell' for the first time, which is the basic unit of life.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Explain how the shape and structure of a nerve cell are specifically adapted to its function in the human body.

Ans. Nerve cells, also known as neurons, are responsible for carrying messages in our body. Their unique shape—elongated and branched—is perfectly adapted for this function. This structure allows them to reach different parts of the body and pass on messages quickly, which is crucial for communication within the nervous system.

12. A person prepares a pickle by adding a high concentration of salt to vegetables. Explain, based on the information in the chapter, why this method prevents microbial growth and spoilage.

Ans. The high concentration of salt in the pickle acts as a preservative. A high concentration of salt or sugar does not allow microorganisms to grow on food items. This is because the high solute concentration draws water out of the microbial cells through osmosis, dehydrating and killing them, thus preventing the spoilage of the pickle.

13. Explain the difference between unicellular and multicellular organisms with examples mentioned in the chapter.

Ans. Unicellular organisms are made up of just a single cell. Examples: bacteria and Amoeba. Multicellular organisms are made up of many cells. Examples: plants, animals, and some fungi like mould.

14. How do some microorganisms, like bacteria and fungi, act as "key players in cleaning the environment"?

Ans. Some microorganisms like fungi and bacteria are "key players in cleaning the environment" because they act on decaying plant and animal waste, breaking it down into simpler substances. These simpler substances are nutrient-rich and turn into manure, which helps to increase soil fertility. This process helps recycle waste and return important nutrients to nature.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Describe the three basic parts of a cell and briefly explain the function of each part.

Ans. The three basic parts of a cell are:

Cell membrane: This is the thin outer lining of the cell. It encloses the cytoplasm and the nucleus, separates one cell from another, and is porous, allowing essential materials to enter and waste materials to exit.

Cytoplasm: This is the space between the cell membrane and the nucleus, filled with a substance containing various cell components and compounds like carbohydrates, proteins, fats, and mineral salts. Most of the life processes of the cell take place within the cytoplasm.

Nucleus: This is the small, round structure usually in the central region of the cell. It is covered by a thin membrane and regulates all activities that occur within the cell, including growth.

16. A student observes a microscopic slide of a plant cell and an animal cell side-by-side. Based on the chapter, list three key differences the student would observe between the two cells.

Ans. A student would observe the following three key differences:

Cell Wall: The plant cell would have an extra outer layer called the cell wall, which is absent in the animal cell.

Chloroplasts: The plant cell would have tiny rod-shaped structures called chloroplasts, which are absent in the animal cell. Chloroplasts contain chlorophyll and are essential for photosynthesis.

Vacuoles: The plant cell would have a large, central vacuole that helps in storage and maintaining cell shape. In animal cells, vacuoles are either absent or are very small.

17. The process of curdling milk into curd is a common household phenomenon. Explain the role of the microorganism responsible for this process, including the specific conditions required for it to thrive.

Ans. The microorganism responsible for curdling milk is a bacterium called *Lactobacillus*. This bacterium feeds on the sugar present in the milk (lactose) and ferments it. During this process, it produces lactic acid, which makes the curd sour and causes the milk to curdle. These bacteria grow best in warm conditions, which is why a small amount of curd (containing the bacteria) is added to lukewarm milk and kept in a warm place for curd formation.

SECTION – D

Questions 18 carry 5 marks each.

18. Imagine you are a scientist trying to find a new way to deal with waste from a local farm. Based on the chapter, explain how you could use microorganisms to help solve this problem. Detail the process, the microorganisms involved, and the potential products that could be created from this process.

Ans. To solve the problem of farm waste, I would propose a process using microorganisms to produce biogas, a clean and renewable fuel.

Process: The process would involve collecting the farm waste, such as plant waste and animal dung. This waste would be put into a container or pit where an oxygen-free environment is maintained.

Microorganisms: Specific types of bacteria and fungi that thrive in an oxygen-free environment would be used for this purpose. These microorganisms have the ability to decompose the plant and animal waste efficiently.

Products: During the decomposition process, these microorganisms release a mixture of gases. The most important components of this mixture are methane, which is a high proportion, and carbon dioxide. This gas mixture is known as biogas.

Utilization: The biogas produced can be used as a fuel source for various purposes on the farm itself, such as for cooking, heating, or even generating electricity. This not only helps in managing the farm waste but also provides a sustainable energy source, reducing reliance on conventional fuels. This process is a great example of how microorganisms can be used to solve environmental problems like pollution and waste management.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study-1: The Tiny Food Factory

Rohit, a young chef, was fascinated by the fermentation process. He learned that many of his favorite foods, from bread to idli, rely on tiny, invisible organisms. He decided to experiment with making his own sourdough bread, which requires a starter culture of microorganisms. Rohit knew that these microbes need specific conditions to work their magic. He prepared a dough by mixing flour, water, and a pinch of sugar, and then added a small amount of yeast. He kept the bowl in a warm corner of his kitchen, away from drafts. To his delight, after a few hours, the dough had risen, become fluffy, and had a distinctive smell.



Based on the passage and the chapter, answer the following questions:

- What is the function of the sugar and warm water in Rohit's dough preparation?
- How did the yeast make the dough rise and become fluffy?
- What is the name of the process by which the yeast broke down the sugar?
- Besides yeast, name another microorganism mentioned in the chapter that helps in the fermentation of food items.

Ans. (a) The sugar in Rohit's dough acts as a food source for the yeast. The warm water provides the optimal temperature condition for the yeast to grow and carry out its life processes efficiently.

(b) When the yeast consumes the sugar in the dough, it respire and breaks down the food to release energy. A byproduct of this process is carbon dioxide gas, which forms bubbles within the dough, causing it to rise and become soft and fluffy.

(c) The process by which yeast breaks down food and releases carbon dioxide and a small amount of alcohol is called fermentation.

(d) Lactobacillus, a type of bacterium that helps in the fermentation of milk to form curd and also ferments batter for idli and dosa.

20. Case Study-2: The Ocean's Unseen Powerhouse

A marine biologist, Dr. Anya, was studying the health of a coral reef. She explained to her team that the ocean's ecosystem is heavily dependent on microscopic plant-like organisms. These tiny organisms are so abundant that they produce a significant portion of the Earth's oxygen supply. She highlighted their importance not just for oxygen production but also as a food source for aquatic life and even for humans as a health supplement. Dr. Anya also warned that their existence is threatened by human activities like pollution.



Based on the passage and the chapter, answer the following questions:

- What are the microscopic organisms that Dr. Anya is referring to?
- How do these organisms produce oxygen?
- Name two other uses of these organisms mentioned in the chapter.
- Why is it important to conserve these tiny organisms?

Ans. (a) Dr. Anya is referring to microalgae.

(b) Microalgae are plant-like organisms, and they produce their own food using sunlight through a process called photosynthesis. While doing so, they release a significant amount of oxygen into the atmosphere.

(c) Microalgae are also used by humans as health supplements and medicines, such as Spirulina and Chlorella. They can also be used to clean water and make biofuel.

(d) It is important to conserve these tiny organisms because they are responsible for producing more than half of the Earth's oxygen supply. Their role in the environment is crucial for maintaining the oxygen balance and protecting the entire ecosystem.

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