INDIAN SCHOOL AL WADI AL KABIR

Class: XI	**DEPARTMENT OF SCIENCE: 2025 – 2026** **SUBJECT: BIOLOGY**	**Date: 10/11/2025**
Worksheet: 14	**UNIT- I- Diversity in the living world** **CHAPTER 3 Biological classification**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

I. MULTIPLE CHOICE QUESTIONS (1M)

1. Some bacteria thrive in extreme environmental conditions, such as absence of oxygen, high salt concentration, high temperature and acidic pH. Name them.
   A. Cyanobacteria
   B. Eubacteria
   C. Archaebacteria
   D. Streptococcus
2. The imperfect fungi that decompose litter and help in mineral cycling are known as:
   A. Basidiomycetes
   B. Deuteromycetes
   C. Ascomycetes
   D. Zygomycetes
3. What is the main basis of classification in the five-kingdom system?
   A. Possess RBC
   B. Cell structure
   C. Asexual Reproduction
   D. Mode of digestion
4. Genes of Tobacco Mosaic Virus are _____.
   A. Double-stranded RNA
   B. Single-stranded RNA
   C. Double-stranded DNA
   D. Proteinaceous
5. Phylogenetic classification is based on _____.
   A. Overall similarities
   B. Habit of plants
   C. Common evolutionary descendants
   D. All of these

Two statements are given - one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct

explanation of the Assertion (A).
C. Assertion (A) is true, Reason (R) is false.
D. Assertion (A) is false, Reason (R) is true.

6. Assertion(A): Phycomycetes are generally called algal fungi.
Reason(R): It is believed that phycomycetes have evolved from algae.

7. Assertion (A): Kingdom-Protista forms a link between monerans and the other organism like plants, animal and fungi.
Reason (R): Protist reproduce sexually and asexually by a process involving cell fusion and zygote formation.
8. Assertion (A): Several ruminant animals contain methanogens within their gut.
Reason(R): Methanogens help in the production of methane from dung of ruminants.

II. VERY SHORT ANSWER TYPE QUESTIONS(2M)

9. What is the nature of cell walls in diatoms?
10. i) Mention any two adaptive features of leaves of gymnosperms.
ii) Give one example of branched and unbranched Gymnosperms.
11. Plants are autotrophic. Can you think of some partially heterotrophic plants?
12. Why is Neurospora extensively used in genetic experiments?

III. SHORT ANSWER TYPE QUESTIONS (3M)

13. A. State two economically important uses of:
(a) Heterotrophic bacteria
(b) Archaebacteria
B. Who discovered Viroids? Name one plant disease caused by Viroids.
14. Who proposed the five-kingdom classification? Compare all the kingdoms on the basis of their nutritional requirement.
15. Describe briefly the major groups of protozoa.

IV. CASE STUDY BASED QUESTIONS (4M)

16. A group of students visited a lake that recently experienced an algal bloom, making the water appear reddish. Upon investigation, they identified a single-celled, eukaryotic organism with a rigid cellulose plate in its cell wall and two flagella. During the bloom, this organism had multiplied rapidly. After a few weeks, the students returned to find the lake water had cleared, and a thick layer of fine, gritty white powder had settled at the bottom
A. Which group of protists is the organism causing the algal bloom?
B. What is the composition of the fine white powder found at the bottom of the lake?
C. Explain the consequence of the "red tide" caused by the organism.
D. Based on the characteristics described, explain why this organism is classified under Kingdom Protista and not Plantae.

V. LONG ANSWER TYPE QUESTIONS (5M)

17. A. Give a comparative account of the classes of kingdom Fungi under the following:
(i) mode of nutrition (ii) mode of reproduction
B. How are viroids different from viruses?
C. How can some cyanobacteria fix atmospheric nitrogen?

18. How many types of bacteria are there? Explain with the help of diagrams?

Answer Key

Q. No.	Answer
I.	**MULTIPLE CHOICE QUESTIONS (1M)**
1	C. Archaebacteria
2	B. Deuteromycetes
3	B. Cell structure
4	B. Single-stranded RNA
5	C. Common evolutionary descendants
	ASSERTION & REASONING
6	A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
7	B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
8	C. Assertion (A) is true, Reason (R) is false.
II	**VERY SHORT ANSWER TYPE QUESTIONS(2M)**
9	The nature of cell walls in diatoms is that they are made of silica, consist of two thin overlapping shells, are almost indestructible, and contribute to the formation of diatomaceous earth.
10	i) In conifers (gymnosperms), the needle-like leaves reduce the surface area. Their thick cuticle and sunken stomata also help to reduce water loss. ii) Unbranched (Cycas) or branched (Pinus, Cedrus).
11	Plants have autotrophic mode of nutrition as they contain chlorophyll pigment. Thus, they have the ability to prepare their own food by the process of photosynthesis. However, some insectivorous plants are partially heterotrophic. They have various means of capturing insects so as to supplement their diet with required nutrients derived from insects, causing proliferation of growth. The examples include pitcher plant (Nepenthes), Venus fly trap, bladderwort, and sundew plant.
12	Neurospora is used in genetic experiments for three reasons. (1) It can easily be grown in a nutrient medium containing simple organic substances, mineral salts, vitamins, and hormones in the lab. (2) Its life cycle is very short. (3) It is very easy to introduce mutations in Neurospora by using X-rays.
III	**SHORT ANSWER TYPE QUESTIONS (3M)**
13	A. (a) Heterotrophic bacteria • Curd and cheese production: Used for fermenting milk.

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Antibiotic and vitamin production: A source for many medicines.

(b) Archaebacteria

Biogas production: Methanogens produce methane from organic waste.
Enzyme production: Provide specialized enzymes for industrial use.

B. Viroids were discovered by Theodor O. Diener in 1971. One plant disease caused by viroids is potato spindle tuber disease.
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<tr><td>14</td><td>American biologist R.H. Whittaker proposed the five-kingdom classification in 1969. The classification system grouped all living organisms into five kingdoms: Monera, Protista, Fungi, Plantae and Animalia
<table>
<tr><th>Kingdom</th><th>Mode of Nutrition</th><th>Details</th></tr>
<tr><td>Monera</td><td>Autotrophic and Heterotrophic</td><td>Can be photosynthetic (using light) or chemosynthetic (using chemical energy). They can also be heterotrophic, living as saprophytes or parasites.</td></tr>
<tr><td>Protista</td><td>Autotrophic and Heterotrophic</td><td>Can be photosynthetic (like algae) or heterotrophic (like protozoans). Some are also saprotrophic.</td></tr>
<tr><td>Fungi</td><td>Heterotrophic</td><td>Mostly saprophytic, meaning they absorb nutrients from dead and decaying organic matter. They can also be parasitic or live in a symbiotic relationship.</td></tr>
<tr><td>Plantae</td><td>Autotrophic</td><td>Primarily photosynthetic, producing their own food using sunlight. A few are parasitic.</td></tr>
<tr><td>Animalia</td><td>Heterotrophic</td><td>Dependent on other organisms for food. They primarily consume food through ingestion (holozoic).</td></tr>
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<tr><td>15</td><td>Amoeboid protozoans (Sarcodines):
These are freshwater, marine, or moist soil dwellers that have no fixed shape.
They move and capture their food by putting out temporary, finger-like extensions of their cytoplasm called pseudopodia (false feet).Examples include Amoeba and the parasitic Entamoeba.
Flagellated protozoans (Zooflagellates):
Members of this group are either free-living or parasitic.
They possess flagella, which are whip-like structures used for movement.Examples include Trypanosoma, which causes sleeping sickness.
Ciliated protozoans (Ciliates):
These are aquatic organisms that move actively with the help of thousands of cilia covering their body. Due to a pellicle, they have a fixed shape.
They possess a cavity called a gullet, which opens to the outside of the cell surface.
E.g.Paramecium.
Sporozoans:
This is a diverse group of organisms that are all internal parasites.
They lack locomotory structures like cilia or flagella.
Their life cycle includes an infectious spore-like stage. Plasmodium.</td></tr>
<tr><td>IV</td><td>CASE STUDY BASED QUESTIONS (4M)</td></tr>
<tr><td>16.A</td><td>The organisms causing algal blooms belong to the group dinoflagellates, a type of marine and</td></tr>
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	freshwater protists that multiply rapidly under favourable conditions, often discoloring the water and releasing toxins.
B	The fine white powder at the bottom of the lake is siliceous (silica) shells of diatoms, collectively called diatomaceous earth.
C	During such algal blooms, toxins released by these dinoflagellates can kill many marine animals like fishes and other aquatic organisms. When the bloom ends and the algae die, their decomposition depletes the dissolved oxygen in water, further harming aquatic life and disturbing the marine ecosystem.
D	The organism (dinoflagellate) is placed under Kingdom Protista and not Plantae because, although it contains chlorophyll and can photosynthesize like plants, it is unicellular and eukaryotic, with a cell structure and organization different from multicellular plants. It shows both autotrophic and heterotrophic modes of nutrition, has flagella for movement, and its cell wall is made of cellulose and plates of silica, all of which are characteristic features of protists, not of true plants.
V	**LONG ANSWER TYPE QUESTIONS (5M)**
17 A	

Feature	**Phycomycetes**	**Ascomycetes**	**Basidiomycetes**	**Deuteromycetes**
Mode of Nutrition	Saprophytic or parasitic	Decomposers, saprophytic	Saprophytic	Decomposers, saprophytic
Mode of Reproduction	Asexual (zoospores, aplanospores); sexual (zygotes)	Asexual (conidia); sexual (ascospores)	Sexual (basidiospores)	Asexual (conidia)

B	• Viroids consist of single-stranded RNA without a protein coat, while viruses have genetic material (RNA or DNA) encased in a protein coat. • Viroids are much smaller in size compared to viruses. • Viroids infect only plants, whereas viruses infect plants, animals, and microorganisms.
C	Some cyanobacteria can fix atmospheric nitrogen because they possess specialized cells called heterocysts, which provide an anaerobic environment for the enzyme nitrogenase to convert atmospheric nitrogen into ammonia usable by plants.
18	Bacteria are classified based on their shape into three main types: 1. Coccus (Spherical) o Shape: Round or spherical. o Examples: *Streptococcus*, *Staphylococcus*. o Arrangement: Single, pairs (diplococci), chains (streptococci), clusters (staphylococci). 2. Bacillus (Rod-shaped) o Shape: Cylindrical or rod-like. o Examples: *Escherichia coli*, *Bacillus subtilis*. o Arrangement: Single or in chains. 3. Spirillum / Spirochete (Spiral-shaped) o Shape: Spiral or helical.

- Examples: *Spirillum volutans*, *Treponema pallidum*.
- Movement: Motile with flagella.

4. Vibrio (Comma-shaped)
   - Shape: Curved rods resembling a comma.
   - Examples: *Vibrio cholerae* (causes cholera).

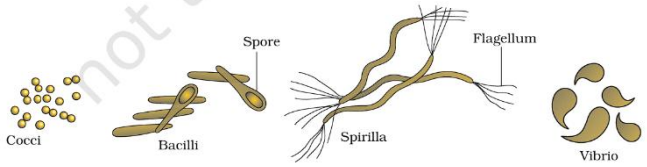

Figure 2.1 Bacteria of different shapes

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