Class 8 Science – Microorganisms: Friend and Foe (Advanced Worksheet)

Section A: Multiple Choice Questions (MCQs)

1. Which of the following pairs shows both microorganisms used in nitrogen fixation and antibiotic production, respectively?
   A) Rhizobium and Penicillium
   B) Lactobacillus and Rhizobium
   C) Penicillium and Lactobacillus
   D) Rhizobium and Aspergillus

2. Which of these statements is incorrect about viruses?
   A) They reproduce only inside host cells
   B) They are considered living only inside cells
   C) They can be killed by antibiotics
   D) They can cause diseases in plants, animals, and humans

3. Lactobacillus is used in the production of:
   A) Curd
   B) Bread
   C) Alcohol
   D) Vinegar

4. In which of the following processes is yeast not involved?
   A) Bread making
   B) Wine production
   C) Antibiotic production
   D) Fermentation

5. Which microorganism is used in producing alcohol from sugar?
   A) Lactobacillus
   B) Rhizobium
   C) Penicillium
   D) Saccharomyces

Section B: Assertion and Reason

Choose:
(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, R is false.
(D) A is false, R is true.

6. Assertion (A): Viruses are placed in a separate category from other microorganisms.
Reason (R): Viruses can perform all life functions on their own.

7. Assertion (A): Some bacteria are essential for the nitrogen cycle.
Reason (R): These bacteria convert atmospheric nitrogen into proteins directly in human blood.

Section C: Case-Based Questions

A food manufacturing company uses Lactobacillus to prepare curd and Saccharomyces cerevisiae for fermentation. The production unit is regularly sterilized, but last month, a viral outbreak occurred in the factory workers. The factory had to temporarily shut down.

8. Which two types of microorganisms are intentionally used in the factory?
9. Why is sterilization important in such factories?
10. Why couldn't the company use antibiotics to control the viral outbreak?

Section D: Short Answer (Application/Reasoning-Based)

11. Why does milk spoil faster in summer than in winter? (Hint: microbial activity)
12. A farmer uses a chemical fertilizer instead of bio-fertilizer. What possible long-term problems might arise?
13. Why is Pasteurization important in milk packaging? What will happen if pasteurized milk is not stored properly?
14. How do microbes help in cleaning the environment? Give one real-life example.
15. Explain how microorganisms can be both helpful and harmful in agriculture.

Section E: Higher-Order Thinking (HOTS)

16. A person stores bread in a moist, warm environment. After 2 days, a black, fuzzy growth appears.
a) Identify the microorganism type and name.
b) How does it reproduce?
c) Why did it grow faster in this condition?
17. Why are vaccines given in advance even before a person gets infected?
18. Imagine a world where all microorganisms are destroyed. Write two good and two bad effects of this.
19. Why should antibiotics be taken for the full prescribed course, even if the patient feels better in 2 days?
20. Differentiate between biodegradable and non-biodegradable waste. How do microorganisms help in managing biodegradable waste?