



# CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-XII

Subject: Biology

Chapter Name : Microbes in Human Welfare (Chap : 8)

Total : 6 Marks (expected) [MCQ(2)-2 Marks, CBQ(1)-4 Marks]

Level - 2

**MCQ Type :**

1. Which step in sewage treatment is mainly responsible for the reduction in BOD?  
 A Chlorination  
 B Primary sedimentation  
 C Formation of flocs by aerobic microbes  
 D Anaerobic digestion

**Hint : BOD decreases when organic matter is oxidised**

2. Which pair is incorrectly matched?  
 A *Trichoderma* - Cyclosporin A  
 B *Monascus purpureus* - Statins  
 C *Aspergillus niger* - Citric acid  
 D *Saccharomyces cerevisiae* - Penicillin

**Hint : Identify the wrong antibiotic producer**

3. Biogas plant mainly depends upon the activity of:  
 A Methanogens only  
 B Eubacteria only  
 C Cyanobacteria  
 D Fungi

**Hint : Methane production is the final step**

4. Activated sludge consists of:  
 A Anaerobic bacteria and fungi  
 B Free-floating microbes  
 C Flocs of bacteria and fungal filaments  
 D Protozoans only

**Hint : Flocs are essential**

5. Which of the following is not a function of lactic acid bacteria in curd?  
 A Improves nutritional quality  
 B Produces antibiotics  
 C Increases vitamin B<sub>12</sub>  
 D Coagulates milk proteins

**Hint : Think of LAB benefits mentioned in NCERT**

6. Which microbial product is immunosuppressive in nature?  
 A Streptokinase  
 B Cyclosporin A  
 C Statin  
 D Penicillin

**Hint : Used during organ transplantation**

7. The secondary treatment of sewage is also called:  
 A Physical treatment  
 B Chemical treatment  
 C Biological treatment  
 D Mechanical treatment

**Hint : Involves microbes**

8. Which of the following organisms is obligate anaerobe?  
 A *Nitrosomonas*  
 B *Methanobacterium*  
 C *Azotobacter*  
 D *Lactobacillus*

**Hint : Survives only without oxygen**

9. Which component of floc mainly helps in aggregation?  
 A Cell wall  
 B Flagella  
 C Extracellular polysaccharides  
 D Pili

**Hint : Sticky substance**

10. Which treatment ensures safe drinking water by killing pathogens?  
Ⓐ Aeration Ⓑ Floc formation Ⓒ Chlorination Ⓓ Sludge digestion

**Hint : Final step**

**Assertion and Reason:**

**Directions:** Read the following questions and choose any one of the following four responses.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.  
B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.  
C: Assertion is correct but Reason is wrong.  
D: Assertion is wrong but Reason is correct.

1. **Assertion (A):** Activated sludge is rich in aerobic microbes.

**Reason (R) :** These microbes reduce BOD by oxidising organic matter.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

**Hint : Check relationship.**

2. **Assertion (A):** Statins are prescribed to patients with heart diseases.

**Reason (R) :** Statins inhibit HMG-CoA reductase.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

**Hint : Enzyme involved in cholesterol synthesis.**

3. **Assertion (A):** Primary sewage treatment reduces BOD significantly.

**Reason (R) :** It removes suspended organic matter mechanically.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

**Hint : Compare with secondary treatment.**

4. **Assertion (A):** Methanogens are found in rumen of cattle.

**Reason (R) :** They help in cellulose digestion by producing methane.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

**Hint : Methane is by-product, not digestive enzyme.**

5. **Assertion (A):** Antibiotics are effective against viral infections.

**Reason (R) :** Viruses lack metabolic machinery.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

**Short Answer Questions :**

1. Explain why secondary sewage treatment is more effective than primary treatment.

**Hint : Role of microbes and BOD**

2. State three differences between primary and secondary sewage treatment.

**Hint : Process, microbes, outcome**

3. How do statins lower blood cholesterol levels?

**Hint : Enzyme inhibition**

4. Mention three advantages of lactic acid bacteria in fermented foods.

**Hint : Nutrition + safety**

5. Why are methanogens called obligate anaerobes?

**Hint : Oxygen sensitivity**

6. Name the organism producing cyclosporin A and state its medical importance.

**Hint : Transplant surgery**

7. What is BOD? Why is it an important parameter in sewage treatment?

**Hint : Organic load**

**Long Answer Questions :**

1. Describe the complete process of secondary sewage treatment with diagrammatic explanation.

**Hint : Aeration tank → flocs → activated sludge → BOD reduction**

2. Explain the production and uses of biogas in detail.

**Hint : Three groups of microbes**

3. Discuss the role of microbes in industrial production of antibiotics and enzymes.

**Hint : Penicillin, streptokinase**

4. Explain the contribution of microbes in human health and medicine.

**Hint : Antibiotics, statins, cyclosporin A**

5. Describe how sewage water can be converted into a resource.

**Hint : Treated water + biogas + manure**

**Case Based Questions:**

1. A city uses a multi-stage sewage treatment plant before releasing water into a river.

(a) Identify the stage where flocs are formed.

**Hint : Aeration tank**

(b) Name the microbes present in flocs.

**Hint : Bacteria + fungi**

(c) What happens to activated sludge?

**Hint : Inoculum + digester**

(d) Why is BOD checked before release?

**Hint : Pollution indicator**

2. The gas produced by the action of bacteria on biomass is called biogas or gobar gas. A rural household uses gobar gas plant for energy. The technology for biogas production from cow dung was developed by IARI (Indian Agricultural Research Institute) and KVIC (Khadi & Village Industries Commission)

(a) Name the main microorganism involved.

**Hint : Methane producer**

(b) Why must the digester be airtight?

**Hint : Anaerobic condition**

(c) Mention two by-products of biogas plant.

**Hint : Slurry**

(d) State one ecological benefit.

**Hint : Waste recycling**

3. Study the diagram given below and answer the following questions:

- Name the components gaining entry from A into the chamber.
- Mention the group of bacteria and conditions in which they act on the components that entered from A into the digester.
- What happens to excess sludge?

**Hint : Anaerobic digester**

- State one reason why this process reduces water pollution.

**Hint : Lower BOD**

**A|N|S|W|E|R** \_\_\_\_\_

**MCQs**

1. (C)	3. (A)	5. (B)	7. (C)	9. (C)
2. (D)	4. (C)	6. (B)	8. (B)	10. (C)

**Assertion-Reason**

1. (A)	2. (A)	3. (D)	4. (B)	5. (D)
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