



# 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?

(A) Aeration

(B) Floc formation

(C) Chlorination

(D) 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) A

(B) B

(C) C

(D) D

**Hint : Check relationship.**

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

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

(A) A

(B) B

(C) C

(D) 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) A

(B) B

(C) C

(D) 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) A

(B) B

(C) C

(D) 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) A

(B) B

(C) C

(D) 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:

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

**Hint : Anaerobic digester**

- (d) State one reason why this process reduces water pollution.

**Hint : Lower BOD**

## ANSWER

### 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
------	------	------	------	------

