

Waste Water Treatment Quiz

Answer the questions below then check your answers.

1. Which of the following best describes waste water? (1 mark)
 - A) Water that has been purified for drinking
 - B) Water that has been used and now contains impurities
 - C) Water stored underground in aquifers
 - D) Rainwater collected from roofs

2. Waste water from homes and industry contains _____ and other _____ that must be removed before it is released into rivers. (2 marks)

3. State one reason why waste water must be treated before being released into rivers. (1 mark)

4. Which of these is not a source of waste water? (1 mark)
 - A) Rainwater runoff from roads
 - B) Sewage from homes
 - C) Steam from power stations
 - D) Effluent from factories

5. What are the two main stages that remove large solid materials from waste water? (1 mark)

6. Match each stage with its correct description: (2 marks)

Stage
a) Aeration
b) Sedimentation
c) Screening

Description
i) Large solids removed by metal grids
ii) Organic matter broken down by aerobic bacteria
iii) Solids settle as sludge at tank bottom

7. The liquid that flows from one stage of treatment to the next is called: (1 mark)

- A) Sludge
- B) Effluent
- C) Slurry
- D) Runoff

8. Fill in the blank:

During sedimentation, heavier solids settle at the bottom of the tank to form _____. (1 mark)

9. Put these stages in the correct order (number 1–4): (2 marks)

- ___ Sedimentation tank
- ___ Screening
- ___ Aeration / trickling filter
- ___ Grit and grease removal

10. What type of microorganisms are used in aeration tanks, and what do they need to survive? (1 mark)

11. Which gas is mainly produced when sludge is broken down anaerobically? (1 mark)
- A) Carbon dioxide
 - B) Methane
 - C) Hydrogen
 - D) Oxygen
12. Anaerobic digestion takes place in the absence of _____ and produces a gas mixture known as _____. (1 mark)
13. Give one useful way in which the methane produced during anaerobic digestion is used at the treatment works. (1 mark)
14. Identify and correct the error in this statement: (2 marks)
"In the aeration tank, anaerobic bacteria use no oxygen to break down organic waste."
15. The dried sludge left after digestion can be used as a soil conditioner or fertiliser. (1 mark)
16. Why would untreated sewage entering a river cause fish to die? (1 mark)
17. Which of the following pollutants is most likely to come from farms? (1 mark)
- A) Heavy metals
 - B) Oils and dyes
 - C) Fertilisers and pesticides
 - D) Plastic waste
18. Give one example of an extra treatment sometimes needed for industrial waste water. (1 mark)

19. Extended response (3 marks)

Describe the main stages of waste water treatment from when it enters the works to when it leaves.

Answer: Waste water first passes through metal screens to remove large solids (screening), then through grit channels to remove sand and grease. In sedimentation tanks, solids settle as sludge. The liquid effluent is then treated biologically in aeration tanks or trickling filters by aerobic bacteria. Finally, sludge is treated by anaerobic digestion to produce methane, and the cleaned water is discharged safely into rivers.

20. Challenge question (2 marks)

Explain how waste water treatment helps to protect both human health and the environment.

Answer: It removes harmful microorganisms and toxic substances that could cause disease or pollute drinking water sources (protecting health) and prevents oxygen depletion or poisoning of aquatic life (protecting the environment).

Answers

1. Which of the following best describes waste water? (1 mark)

- A) Water that has been purified for drinking
- B) Water that has been used and now contains impurities
- C) Water stored underground in aquifers
- D) Rainwater collected from roofs

Answer: B – Water that has been used and now contains impurities.

2. Waste water from homes and industry contains _____ and other _____ that must be removed before it is released into rivers. (2 marks)

Answer: solids; pollutants (accept impurities or harmful substances).

3. State one reason why waste water must be treated before being released into rivers. (1 mark)

Answer: To prevent pollution and protect aquatic life from harmful substances or lack of oxygen.

4. Which of these is not a source of waste water? (1 mark)

- A) Rainwater runoff from roads
- B) Sewage from homes
- C) Steam from power stations
- D) Effluent from factories

Answer: C – Steam from power stations.

5. What are the two main stages that remove large solid materials from waste water? (1 mark)

Answer: Screening and grit (settling) removal.

6. Match each stage with its correct description: (2 marks)

- a) Aeration
- b) Sedimentation
- c) Screening

- i) Large solids removed by metal grids
- ii) Organic matter broken down by aerobic bacteria
- iii) Solids settle as sludge at tank bottom

Answer: a → ii, b → iii, c → i.

7. The liquid that flows from one stage of treatment to the next is called: (1 mark)

- A) Sludge
- B) Effluent
- C) Slurry
- D) Runoff

Answer: B – Effluent.

8. Fill in the blank:

During sedimentation, heavier solids settle at the bottom of the tank to form _____. (1 mark)

Answer: sludge.

9. Put these stages in the correct order (number 1–4): (2 marks)

- ____ Sedimentation tank
- ____ Screening
- ____ Aeration / trickling filter
- ____ Grit and grease removal

Answer: 1 Screening; 2 Grit and grease removal; 3 Sedimentation tank; 4 Aeration / trickling filter.

10. What type of microorganisms are used in aeration tanks, and what do they need to survive? (1 mark)

Answer: Aerobic bacteria; they need oxygen.

11. Which gas is mainly produced when sludge is broken down anaerobically? (1 mark)
- A) Carbon dioxide
 - B) Methane
 - C) Hydrogen
 - D) Oxygen

Answer: B – Methane.

12. Anaerobic digestion takes place in the absence of _____ and produces a gas mixture known as _____. (1 mark)

Answer: oxygen; biogas.

13. Give one useful way in which the methane produced during anaerobic digestion is used at the treatment works. (1 mark)

Answer: As a renewable fuel to power equipment or generate electricity.

14. Identify and correct the error in this statement: (2 marks)
"In the aeration tank, anaerobic bacteria use no oxygen to break down organic waste."

Answer: The bacteria are aerobic, not anaerobic — they require oxygen to break down organic waste.

15. The dried sludge left after digestion can be used as a soil conditioner or fertiliser. (1 mark)

Answer: True.

16. Why would untreated sewage entering a river cause fish to die? (1 mark)

Answer: Bacteria decompose the organic matter and use up the dissolved oxygen needed by fish.

17. Which of the following pollutants is most likely to come from farms? (1 mark)

- A) Heavy metals
- B) Oils and dyes
- C) Fertilisers and pesticides
- D) Plastic waste

Answer: C – Fertilisers and pesticides.

18. Give one example of an extra treatment sometimes needed for industrial waste water. (1 mark)

Answer: Precipitation of heavy metals, chemical neutralisation, filtration, chlorination, or UV treatment. (Any one).

19. Extended response (3 marks)

Describe the main stages of waste water treatment from when it enters the works to when it leaves.

Answer: Waste water first passes through metal screens to remove large solids (screening), then through grit channels to remove sand and grease. In sedimentation tanks, solids settle as sludge. The liquid effluent is then treated biologically in aeration tanks or trickling filters by aerobic bacteria. Finally, sludge is treated by anaerobic digestion to produce methane, and the cleaned water is discharged safely into rivers.

20. Challenge question (2 marks)

Explain how waste water treatment helps to protect both human health and the environment.

Answer: It removes harmful microorganisms and toxic substances that could cause disease or pollute drinking water sources (protecting health) and prevents oxygen depletion or poisoning of aquatic life (protecting the environment).