1. Which unit operation is primarily responsible for removing large debris from wastewater?

a) Chemical clarification
b) Sedimentation
c) Grit chamber
d) Biological treatment

Answer: c) Grit chamber

Explanation: A grit chamber is designed to remove heavy solids such as sand, gravel, and other inorganic materials from wastewater through sedimentation. This preliminary treatment step helps protect downstream equipment and processes from abrasion and damage.

2. What is the purpose of using screens in wastewater treatment?

a) To remove dissolved organic matter
b) To remove large debris and solids
c) To neutralize acidic components
d) To enhance biological activity

Answer: b) To remove large debris and solids

Explanation: Screens are used in preliminary treatment to capture large objects and debris from wastewater, preventing them from entering subsequent treatment processes where they could cause blockages or damage equipment.

3. Which unit operation involves the settling of suspended solids under the influence of

gravity?

a) Chemical clarification
b) Filtration
c) Sedimentation
d) Disinfection

Answer: c) Sedimentation

Explanation: Sedimentation is the process by which suspended solids settle to the bottom of a tank or basin due to gravity. This helps in the removal of particulate matter from wastewater, making it clearer and cleaner.

4. What is the primary function of chemical clarification in wastewater treatment?

a) To disinfect the wastewater
b) To remove dissolved gases
c) To enhance biological activity
d) To remove fine suspended particles

Answer: d) To remove fine suspended particles

Explanation: Chemical clarification involves the addition of chemicals to wastewater to coagulate and flocculate fine suspended particles, allowing them to settle out more effectively during sedimentation.

5. Which microorganisms are primarily responsible for biological treatment in wastewater?

a) Viruses
b) Protozoa
c) Bacteria
d) Fungi

Answer: c) Bacteria

Explanation: Bacteria play a crucial role in biological treatment processes such as activated sludge, where they break down organic matter present in wastewater into simpler compounds through biochemical reactions.

6. In a wastewater treatment plant, what is the purpose of a grit chamber?

a) To remove dissolved pollutants
b) To remove heavy solids
c) To neutralize acidic components
d) To disinfect the wastewater

Answer: b) To remove heavy solids

Explanation: A grit chamber is designed to remove heavy inorganic solids such as sand, gravel, and grit from wastewater, preventing damage to downstream equipment and processes.

7. Which unit operation involves the addition of chemicals to promote the aggregation of fine particles in wastewater?

a) Sedimentation

b) Filtration
c) Chemical clarification
d) Disinfection

Answer: c) Chemical clarification

Explanation: Chemical clarification involves the addition of coagulants and flocculants to wastewater to promote the formation of larger particles, which can then be more easily removed during sedimentation.

8. What role do microorganisms play in biological wastewater treatment?

a) Breaking down organic matter
b) Removing dissolved gases
c) Settling suspended solids
d) Neutralizing acidic components

Answer: a) Breaking down organic matter

Explanation: Microorganisms, particularly bacteria, play a vital role in biological wastewater treatment by metabolizing organic matter present in the wastewater, converting it into simpler compounds such as carbon dioxide and water.

9. Which preliminary treatment process is designed to remove settleable solids from wastewater?

a) Screens
b) Grit chamber

c) Chemical clarification
d) Filtration

Answer: b) Grit chamber

Explanation: A grit chamber is specifically designed to remove settleable solids, such as sand, gravel, and grit, from wastewater through the process of sedimentation.

10. What is the purpose of preliminary treatment processes in wastewater treatment plants?

a) To disinfect the wastewater
b) To remove dissolved pollutants
c) To protect downstream equipment
d) To adjust the pH of the wastewater

Answer: c) To protect downstream equipment

Explanation: Preliminary treatment processes such as screening and grit removal are essential for protecting downstream equipment and processes in wastewater treatment plants by removing large debris, grit, and other materials that could cause damage or operational issues.