

1. Discuss the relationship between (a) pH and hydrogen ion concentration (b) pH and hydroxide ion concentration?
2. A decrease in pH of 1 unit represents how much of an increase in hydrogen ion concentration?
3. Why is it necessary to maintain the pH of water nearly 7?
4. What is a buffer solution? Give examples.

5. Where do you find the adverse effects of turbidity in environmental engineering? Mention two instances.
6. Discuss the significance of determination of turbidity in sanitary engineering.
7. Discuss the nature of materials causing turbidity in
 - a. River water during flash flood
 - b. Polluted river water
 - c. Domestic wastewater
8. What is the standard unit of turbidity?
9. What are NTU and JTU?

10. What is the application of determination of settleable solids?
11. Explain the significance of determination of total solids in sanitary engineering.
12. How will the volatile solids affect the strength of sewage? Why?
13. Why do you determine the fixed solids by igniting at 600°C? How will the result be affected, if it has magnesium carbonate content?
14. What significant information is furnished by the determination of volatile solids?
15. What is sludge volume index?

16. Which is the major form of alkalinity? How is it formed?
17. What is excess alkalinity? How do you express it?
18. Why do we take 0.02 N H₂SO₄ for the titration?
19. The water where algae are flourishing is alkaline. Why? Will there be diurnal variation in pH?
20. Why does the pH change on aerating the water?
21. For efficient coagulation the water must be alkaline. Why?
22. Why do we use CO₂ free distilled water for analysis?

23. Discuss the source and nature of acidity.
24. Discuss the significance of carbon dioxide and mineral acidity.
25. Can the pH of a water sample be calculated from a knowledge of its acidity? Why?
26. Can the carbon dioxide content of a wastewater sample known to contain significant concentrations of acetic acid be determined by the titration procedure? Why?

1. Explain the significance of high chloride in water.
2. What are the sources of chloride in water?
3. Explain the need for blank correction.

4. Why must be the sample pH neither high nor low?
5. Why the normality of silver nitrate solution is taken as zero?
6. Would the analytical result by Mohr's method for chlorides be higher, lower, or the same as the true value if an excess indicator were accidentally added to the sample? Why?
7. What are the methods of determination of chlorides?
8. Why do the water has lower content of salt than sewage?

1. How are the iron and manganese removed from water?
2. Explain the significance of Fe and Mn in environmental engineering.
3. In what oxidation state must the manganese be for colorimetric measurement?

1. Discuss the environmental significance of dissolved oxygen.
2. Most of the critical conditions related to dissolved oxygen deficiency occur during summer months. Why?
3. Why do we use 0.025 N sodium thiosulphate solution for the titration?
4. The turbulence of water should be encouraged. Why?
5. Draw the oxygen saturation curve.

1. In what forms does nitrogen normally occur in natural waters?
2. Discuss the significance of nitrate nitrogen analysis in water pollution control.
3. Differentiate between nitrite nitrogen and nitrate nitrogen.
4. Discuss the application of nitrate nitrogen data.
5. What are the various methods available for the determination of nitrate nitrogen?

1. Why is alum preferred to other coagulants?
2. What is the difference between coagulation and flocculation?
3. What are coagulant aids?
4. Write the significance of pH in coagulation using alum.
5. What factors affect the sedimentation of a discrete particle setting in a quiescent liquid?

1. What use is made of the B.O.D. test in water pollution control?
2. List five requirements, which must be completed with, in order to obtain reliable B.O.D. data.
3. List five requirements of satisfactory dilution water for B.O.D. test.
4. What are the three methods that can be used to control nitrification in the 5 days B.O.D. test at 20°C?
5. What are the factors affecting the rate of biochemical oxidation in the B.O.D. test?

1. Differentiate between B.O.D. and C.O.D.

2. Discuss the application of C.O.D. analysis in environmental engineering practice.
3. What are the interferences during C.O.D. test? How this can be eliminated?
4. Why ferroin is used as indicator in the C.O.D. test?
5. Why 0.25 N standard dichromate solution is used in the test?

1. What are E.coli? Are they harmful to human beings? Why is their presence tested in the waters to be supplied for domestic consumption?
2. What is coliform index?
3. Define MPN.