Acids, Bases and Salts

Basic Concepts (Questions 1-5)

1. Define acids and bases according to Arrhenius theory. Give two examples of each from daily life.
2. What are indicators? Name three natural indicators and explain how they help in identifying acids and bases.
3. Explain the difference between strong acids and weak acids with examples.
4. What happens when an acid reacts with a base? Write the general equation for this reaction.
5. Define the pH scale. What is the pH of pure water and why is it considered neutral?

Properties and Reactions (Questions 6-12)

6. What happens when zinc granules react with dilute hydrochloric acid? Write the chemical equation and identify the gas evolved.
7. Explain what happens when an acid reacts with a metal carbonate. Give the chemical equation for the reaction between hydrochloric acid and sodium carbonate.
8. Why does tooth decay occur? How can it be prevented using the concept of pH?
9. A farmer finds that the soil in his field is too acidic. Suggest a remedy and explain why it works.
10. What is meant by water of crystallization? Give two examples of salts that contain water of crystallization.
11. Explain why aqueous solutions of acids conduct electricity.
12. What happens when sodium hydroxide solution reacts with hydrochloric acid? Write the balanced chemical equation and name the type of reaction.

Advanced Concepts (Questions 13-17)

13. Explain the concept of pH with examples. Why is the pH of lemon juice lower than that of tomatoes?
14. What are alkalis? How do they differ from bases? Give two examples of alkalis.
15. Describe the preparation of washing soda from baking soda. Write the chemical equations involved.
16. What is the difference between washing soda and baking soda? Write their chemical names and formulae.

17. Explain why plaster of Paris hardens when mixed with water. Write the chemical equation for this reaction.

Application-Based Questions (Questions 18-20)

18. A student tested four solutions A, B, C, and D using universal indicator and observed the following colors: A - red, B - green, C - blue, D - orange. Identify which solutions are acidic, basic, or neutral. Arrange them in increasing order of their pH values.
19. Explain why factory waste should be neutralized before disposing it into water bodies. What problems can arise if acidic or basic waste is directly released?
20. A baker uses baking soda in making cakes. Explain the role of baking soda in baking. What happens when baking soda is heated? Write the chemical equation.

Bonus Application Questions:

- Why do we apply baking soda on bee stings and vinegar on wasp stings?
- Explain why antacids are used to treat acidity and how they work.
- What causes acid rain and what are its harmful effects?