Acids, Bases and Salts

Multiple Choice Questions

1. Identify a compound which contains replaceable hydrogen.
(a) An acid (b) A base
(c) A salt (d) Both (a) and (b)

2. Which acid is present in an apple?
(a) Citric acid (b) Malic add
(c) Tartaric acid (d) Formic acid

3. Which of the following is a mineral acid?
(a) HCl (b) H_2SO_4
(c) HNO_3 (d) All of the above

4. Which acid completely dissociates when dissolved in water?
(a) An oxyacid (b) A strong acid
(c) A weak acid (d) A hydra acid

5. Which acid is weak among mineral acids?
(a) H_2SO_4 (b) H_2CO_3
(c) HCl (d) HNO_3

6. Which of the following is a strong acid?
(a) Lactic acid (b) Ascorbic acid
(c) Formic acid (d) Sulphuric acid

7. Which of the following is made up of bases?
(a) Antacid tablet (b) Soap
(c) Toothpaste (d) All of the above

8. Which of the following is formed by the reaction of an acid with a base?
(a) A salt (b) An indicator
(c) A vitamin (d) All of the above

9. Identify the salt which contains both negative or positive ions.
(a) A basic salt (b) A normal salt
(c) An acidic salt (d) A double salt

10. Which of the following is a strong base?
(a) Ammonium hydroxide
(b) Sodium hydroxide
(c) Magnesium hydroxide
(d) Copper hydroxide

11. Which of the following is a dibasic acid?
(a) HCl (b) H_3PO_4
(c) HNO_3 (d) H_2SO_4

12. Identify the type of product formed in the given chemical equation.

$$Pb(OH)_2 + HNO_3 \rightarrow Pb(OH)NO_3 + H_2O$$

(a) An acidic salt (b) A basic salt
(c) A base (d) An acid

13. An excess of dilute sulphuric acid reacts with both aqueous barium hydroxide and aqueous barium chloride respectively. In what way are the two reactions the same?
(a) A gas is evolved.
(b) An insoluble salt is formed.
(c) Their final pH is 7.
(d) A base is produced.

14. What is the colour of Copper (II) Chloride formed in the given chemical equation?

$$\underset{(black)}{CuO} + 2HCl \rightarrow \underset{(?)}{CuCl_2} + H_2O$$

(a) Blue (b) Green
(c) Blue-green (d) Both (a) and (b)

15. Identify the pH of a solution that turns blue litmus red.
(a) 8 (b) 6
(c) 9 (d) 10

16. Which solution does not conduct electricity?
(a) Glucose (b) Alcohol
(c) Sulphuric acid (d) Both (a) and (b)

17. Which acid is used in lead storage batteries?
(a) H_2SO_4 (b) HNO_3
(c) HCl (d) CH_3COOH

18. Identify the acid used in the manufacture of glass.
(a) Ascorbic acid (b) Boric acid
(c) Phosphoric acid (d) Tartaric acid

19. A solid element 'X' is a non-metal. It can form
(a) an acidic oxide. (b) a basic oxide.
(c) a salt. (d) a metallic salt.

20. Which gas is passed through dry slaked lime to produce bleaching powder?
(a) H_2 (b) O_2
(c) Cl_2 (d) N_2

21. Which ion is commonly found in an acid and a base?
(a) H^+ (b) OH^-
(c) Cl (d) Both (a) and (b)

22. Identify the acid used for producing explosives.
(a) HNO_3 (b) H_2SO_4
(c) H_2SO_3 (d) HCl

23. Which compound is added to acidic lake water to prevent killing of fishes?
(a) Potassium chloride
(b) Ferrous sulphate
(c) Calcium carbonate
(d) Ammonium chloride

24. Identify the weakest acid from the following.
(a) H_2SO_4 (b) HNO_3
(c) H_2SO_3 (d) HCl

25. A milk man adds a very small amount of baking soda to fresh milk. Why?
(a) To increase the rate of fermentation
(b) To decrease the rate of fermentation
(c) To increase its quality
(d) To make paneer

26. Which of the following occur(s) due to water of crystallisation?
(a) Crystals of salts obtain their shape.
(b) Crystals of salts obtain their colour.
(c) Crystals of salts form a part of crystal structure.
(d) All of the above

27. Which of the following compounds dissolves in water to give a solution with a pH greater than 7?
(a) Calcium carbonate
(b) Copper (ll) hydroxide
(c) Sodium hydroxide
(d) Sulphur dioxide

28. Which calcium compound does NOT increase the pH of acidic soils?
(a) Calcium carbonate (b) Calcium hydroxide
(c) Calcium oxide (d) Calcium sulphate

29. A white compound produces a mixture of gases when heated. This mixture turns moist universal indicator paper red and relights a glowing splinter. What does this mixture contain?
(a) An acidic gas and hydrogen
(b) An acidic gas and oxygen
(c) An alkaline gas and hydrogen
(d) Both (a) and (b)

30. Compound 'X' in the aqueous form reacts with ammonium carbonate to give an acidic gas. What is compound 'X'?
(a) Calcium hydroxide (b) Ethanoic acid
(c) Sodium hydroxide (d) Sulphuric acid

Previous Contest Questions

1. Which of the following is NOT a salt?
(a) Sodium chloride (b) Slaked lime
(c) Lead sulphide (d) Zinc nitrate.

2. Which of the following will not change the pH of 10 cm^3 of dilute HCl when added to the acid?
(a) 5 cm^3 of pure water
(b) 20 cm^3 of pure water
(c) 10 cm of conc. HCl
(d) 20 cm^3 of dil. HCl

3. Which of the given substances is used in the following applications?

(i) It is used as a fire proofing material.
(ii) For sealing gaps in laboratory apparatus.
(iii) It is used in making toys.

(a) Bleaching powder (b) Plaster of Paris
(c) Baking soda (d) Washing soda

4. Which of the following is a salt of strong acid and a weak base?
(a) K_2SO_4 (b) $CaSO_4$
(c) NH_4Cl (d) $MgCl_2$

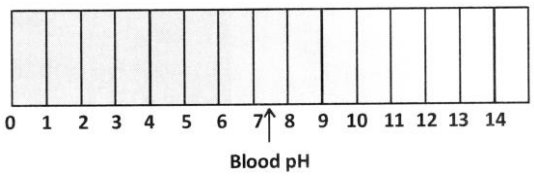
5. Who devised pH scale?
(a) Sorenson (b) Bohr
(c) Somerfield (d) Arrhenius

6. What happens when zinc is added to sodium hydroxide solution in a beaker and warmed?
(a) Zinc granules do not undergo any change.
(b) White coat is formed over zinc granules.
(c) Zinc granules dissolve in sodium hydroxide solution, liberate hydrogen and sodium zincate is formed.
(d) Neutralisation takes place and zinc hydroxide and water are formed.

7. Abhi added a few m/ of cone. Sulphuric acid to zinc granules. Which of the following reactions takes place when metal zinc reacts with it?
(a) $Zn + 2H_2SO_4 \rightarrow ZnSO_3 + 2H_2O + 2SO_2$
(b) $Zn + 2H_2SO_4 \rightarrow Na_2ZnO_2 + H_2$
(c) $Zn + 2H_2SO_4 \rightarrow ZnSO_4 + SO_2 + 2H_2O$
(d) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

8. By A substance 'X' reacts with dilute nitric acid to produce a colourless gas. This gas is dissolved in water to form a solution with pH value less than 7. Identify the substance 'X'.
(a) Sodium chloride (b) Sodium oxide
(c) Sodium hydroxide (d) Sodium carbonate

9. On a pH scale, pH of blood is shown below.



What is the nature of blood?
(a) Neutral (b) Highly alkaline
(c) Slightly alkaline (d) Slightly acidic

10. In an accident at a factory, some nitric acid was spilled. Which substance, when added in excess, would neutrallise the acid without leaving traces of alkaline solution?
(a) Aqueous ammonia
(b) Aqueous sodium hydroxide
(c) Calcium carbonate
(d) Water

Answers with Solutions

Multiple Choice Questions

1. (a) The compound which contains a replaceable hydrogen is an acid.

2. (b) The acid present in apples is malic acid. Its formula is $C_4H_6O_5$.

3. (d) Acids prepared from the minerals of the earth are called mineral acids. HCl, H_2SO_4 and HNO_3 are mineral acids.

4. (b) A strong acid ionises completely when dissolved in water.

5. (b) Carbonic acid (H_2CO_3) is a weak mineral acid.

6. (d) Sulphuric acid ionizes completely when dissolved in water. Hence, it is a strong acid.

7. (d) Antacid tablet, soap and toothpaste are made up of bases.

8. (a) A salt is formed during neutralization reaction.

9. (d) A double salt contains both negative or positive ions.

10. (b) Sodium hydroxide is a strong base.

11. (d) H_2SO_4 is a dibasic acid as it contains two replaceable hydrogen's.

12. (b) The product $Pb(OH)NO_3$ formed is a basic salt.

13. (b) In both the cases, precipitation occurs. A white precipitate of $BaSO_4$ is formed as shown below.

(i) $Ba(OH)_2 + H_2SO_4 \rightarrow BaSO_4 + 2H_2O$

(ii) $BaCl_2 + H_2SO_4 + 2HCl$

14. (c) When black copper (II) oxide reacts with dilute HCl, it dissolves in the acid to form a blue-green solution of copper (II) chloride salt.

15. (b) Solutions which turn blue litmus red are acidic solutions. Their pH is below 7.

16. (d) Glucose and alcohol do not produce hydrogen ions or some other ions in solution form. Due to the absence of ions, they do not conduct electricity.

17. (a) H_2SO_4 is used in lead storage batteries.

18. (b) Boric acid enhances the chemical composition of glass by improving the temperature resistance. Hence, it is widely used to prepare borosilicate and other heat resistant glassware.

19. (a) Element 'X' is a non-metal which combines with atmospheric oxygen to form an acidic oxide like $SO_2, SO_3, P_2O_3, P_2O_5, N_2O_5$ etc.

20. (c) Whence gas is passed through dry slaked lime, bleaching powder is produced.
$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$

21. (d) An acid has H^+ ion and a base has OH^- ion. H^+ and H^+ ions are common to both an acid and a base.

22. (a) HNO_3 is used to produce explosives like nitroglycerine, dynamite, T.N.T. etc.

23. (c) Calcium carbonate is added to acidic lake water which neutralizes the acidic effect and prevents the fishes being killed.

24. (c) H_2SO_3 - sulphurous acid is a weak acid because it ionises partially in water to form few hydrogen ions.

25. (b) A milk man adds a very small amount of baking soda to fresh milk to decrease the rate of fermentation.

26. (d) Water of crystallization forms a part of 1 crystal structure. They also obtain their shape and colour.

27. (c) Sodium hydroxide is an alkali that dissolves in water to form a solution of pH as greater than 7.

28. (d) Calcium sulphate is an insoluble salt that does not react with acidic soil and increase its pH.

29. (b) An acidic gas turns universal indicator paper red and d, relights the glowing splinter.

30. (d) Compound 'X' is Sulphuric acid that reacts with ammonium carbonate to form a weak, acidic, ammonium sulphate along with carbon dioxide gas and water.

Previous Contest Questions

1. (b) Slaked lime or $Ca(OH)_2$ is not a salt.

2. (b) Plaster of Paris is used in all the given applications.

3. (c) NH_4Cl is a salt of strong acid (HCl) and a weak base (NH_4OH).

4. (a) Sorenson devised pH scale.

5. (c) Zinc granules dissolve in sodium hydroxide solution to liberate hydrogen and produce sodium zincate.

6. (c) Zinc gives off SO_2 when it reacts with concentrated sulphuric acid which is an oxidising agent.

7. (d) Sodium carbonate on reaction with dilute nitric acid produces CO_2 gas. This gas dissolves in water to produce carbonic acid whose pH is less than 7.

8. (c) pH from 7.1 to 14 is called alkaline pH. Hence, the pH of blood is between 7 and 8 so, it is slightly alkaline.

9. (b) By adding excess of aqueous sodium hydroxide solution on spilled nitric acid, it undergoes neutralization without leaving traces of alkaline solution.

10. (d) 20 cm^3 of dil. HCl when added to the same amount of dil. HCl will not change its pH.