

**RAVI MATHS TUITION CENTER , CHENNAI- 82. WHATSAPP -
8056206308**

Acids, Bases And Salts MCQ TEST

10th Standard

Science

64 x 1 = 64

- 1) A solution turns red litmus blue; its pH is likely to be?
(a) 1 (b) 4 (c) 5 (d) 10
- 2) A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains.
(a) NaCl (b) HCl (c) LiCl (d) KCl
- 3) 10 ml of a solution of NaOH is found to be completely neutralised by 8 ml of a given solution of HCl. If we take 20 ml of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralise it will be
(a) 4 ml (b) 8 ml (c) 12 ml (d) 16 ml
- 4) Which one of the following types of medicines is used for treating indigestion?
(a) Antibiotic (b) Analgesic (c) Antacid (d) Antiseptic
- 5) What happens when a solution of an acid is mixed with a solution of a base in a test tube?
(a) The temperature of the solution increases (b) The temperature of the solution decreases
(c) The temperatures of the solution remains the same (d) Salt formation takes place
(a) (i) only (b) (i) and (iii) (c) (ii) and (iii) (d) (i) and (iv)
- 6) An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?
(a) Baking powder (b) Lime (c) Ammonium hydroxide solution (d) Hydrochloric acid
- 7) During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to
(a) absorb the evolved gas (b) moisten the gas (c) absorb moisture from the gas
(d) absorb Cl⁻ ions from the evolved gas
- 8) Which of the following salts does not contain water of crystallisation?
(a) Blue vitriol (b) Baking soda (c) Washing soda (d) Gypsum
- 9) Sodium carbonate is a basic salt because it is a salt of
(a) Strong acid and strong base (b) weak acid and weak base (c) strong acid and weak base
(d) weak acid and strong base
- 10) Calcium phosphate is present in tooth enamel. Its nature is
(a) basic (b) acidic (c) neutral (d) amphoteric
- 11) A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?
(a) Lemon juice (b) Vinegar (c) Common salt (d) An antacid

12) Which of the following gives the correct increasing order of acidic strength?

- (a) Water < Acetic acid < Hydrochloric acid (b) Water < Hydrochloric acid < Acetic acid
(c) Acetic acid < Water < Hydrochloric acid (d) Hydrochloric acid < Water < Acetic acid

13) If a few drops of a concentrated acid accidentally spills over the hand of a student, what should be done?

- (a) Wash the hand with saline solution
(b) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogen carbonate
(c) After washing with plenty of water apply solution of sodium hydroxide on the hand
(d) Neutralise the acid with a strong alkali

14) Sodium hydrogen carbonate when added to acetic acid evolves a gas. Which of the following statements are true about the gas evolved?

- (i) It turns lime water milky
(ii) It extinguishes a burning splinter
(iii) It dissolves in a solution of sodium hydroxide
(iv) It has a pungent odour

- (a) (i) and (ii) (b) (i), (ii) and (iii) (c) (ii), (iii) and (iv) (d) (i) and (iv)

15) Common salt besides being used in kitchen can also be used as the raw material for making.

- (i) washing soda
(ii) bleaching powder
(iii) baking soda
(iv) slaked lime

- (a) (i) and (ii) (b) (i), (ii) and (iv) (c) (i) and (iii) (d) (i), (iii) and (iv)

16) One of the constituents of baking powder is sodium hydrogen carbonate, the other constituent is

- (a) hydrochloric acid (b) tartaric acid (c) acetic acid (d) sulphuric acid

17) To protect tooth decay we are advised to brush our teeth regularly. The nature of the toothpaste commonly used is

- (a) acidic (b) neutral (c) basic (d) corrosive

18) Which of the following statements is correct about an aqueous solution of an acid and of a base?

- (i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base

- (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)

19) The pH of the gastric juices released during digestion is

- (a) less than 7 (b) more than 7 (c) equal to 7 (d) equal to 0

20) Which of the following phenomena occur, when a small amount of acid is added to water? (i) Ionisation (ii) Neutralisation (iii) Dilution (iv) Salt formation

- (a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (ii) and (iv)

21) Which one of the following can be used as an acid-base indicator by a visually impaired student?

- (a) Litmus (b) Turmeric (c) Vanilla essence (d) Petunia leaves

22) Which of the following substance will not give carbon dioxide on treatment with dilute acid?

- (a) Marble (b) Limestone (c) Baking soda (d) Lime

23) Which of the following is acidic in nature?

- (a) Lime juice (b) Human blood (c) Lime water (d) Antacid

24) Which of the following is used for dissolution of gold?

- (a) Hydrochloric acid (b) Sulphuric acid (c) Nitric acid (d) Aqua regia

25) Which of the following is not a mineral acid?

- (a) Hydrochloric acid (b) Citric acid (c) Sulphuric acid (d) Nitric acid

26) Which among the following is not a base?

- (a) NaOH (b) KOH (c) NH_4OH (d) CH_3CH_2OH

27) Which of the following statement is not correct?

- (a) All metal carbonates react with acid to give a salt, water and carbon dioxide
(b) All metal oxides react with water to give salt and acid
(c) Some metals react with acids to give salt and hydrogen
(d) Some non-metal oxides react with water to form an acid

28) Match the chemical substances given in Column (A) with their appropriate application given in Column (B).

Column (A)	Column (B)
(A) Bleaching Powder (B) Baking Soda (C) Washing Soda (D) Sodium Chloride	(i) Preparation of glass (ii) Production of H_2 and Cl_2 (iii) Decolourisation (iv) Antacid

- (a) A - (ii), B - (i), C - (iv), D - (iii) (b) A - (iii), B - (ii), C - (iv), D - (i)
(c) A - (iii), B - (iv), C - (i), D - (ii) (d) A - (ii), B - (iv), C - (i), D - (iii)

29) Equal volumes of hydrochloric acid and sodium hydroxide solutions of same concentration are mixed and the pH of the resulting solution is checked with a pH paper. What would be the colour obtained?

- (a) Red (b) Yellow (c) Yellowish green (d) Blue

30) Which of the following is (are) true when HCl (g) is passed through water? (i) It does not ionise in the solution as it is a covalent compound. (ii) It ionises in the solution (iii) It gives both hydrogen and hydroxyl ion in the solution (iv) It forms hydronium ion in the solution due to the combination of hydrogen ion with water molecule

- (a) (i) only (b) (iii) only (c) (ii) and (iv) (d) (iii) and (iv)

31) Which of the following statement is true for acids?

- (a) Bitter and change red litmus to blue (b) Sour and change red litmus to blue
(c) Sour and change blue litmus to red (d) Bitter and change blue litmus to red

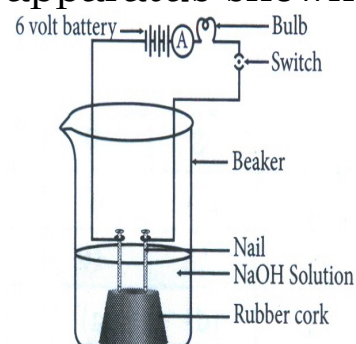
32) Which of the following are present in a dilute aqueous solution of hydrochloric acid?

- (a) $H_3O^+ + Cl^-$ (b) $H_3O^+ + OH^-$ (c) $Cl^- + OH^-$ (d) unionised HCl

33) Identify the correct representation of reaction occurring during chloralkali process

- (a) $2NaCl(l) + 2H_2O(l) \rightarrow 2NaOH(l) + Cl_2(g) + H_2(g)$
- (b) $2NaCl(aq) + 2H_2O(aq) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$
- (c) $2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(aq) + H_2(aq)$
- (d) $2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$

34) In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus shown below was set up.



which among the following statement(s) is (are) correct?

- (i) Bulb will not glow because electrolyte is not acidic
- (ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction.
- (iii) Bulb will not glow because circuit is incomplete.
- (iv) Bulb will not glow because it depends upon the type of electrolytic solution.

- (a) (i) and (iii) (b) (ii) and (iv) (c) (ii) only (d) (iv) only

35) Which one of the following will turn red litmus blue?

- (a) Vinegar (b) Baking soda solution (c) Lemon juice (d) Soft drinks

36) Which one of the following will turn blue litmus red?

- (a) Vinegar (b) Lime water (c) Baking soda solution (d) Washing soda solution

37) Methyl orange is

- (a) Pink in acidic medium, yellow in basic medium
- (b) Yellow in acidic medium, pink in basic medium
- (c) Colourless in acidic medium, pink in basic medium
- (d) Pink in acidic medium, colourless in basic medium

38) Lime water is

- (a) CaO (b) Ca(OH)₂ (c) CaCO₃ (d) CaCl₂

39) The nature of calcium phosphate is present in tooth enamel is

- (a) Basic (b) Amphoteric (c) Acidic (d) Neutral

40) Which of the following salts has no water of crystallization?

- (a) Blue vitriol (b) Washing soda (c) Baking soda (d) Gypsum

41) The role of quick lime in soda lime (mixture) is to

- (a) Absorb moisture present in soda lime (b) Increase the efficiency of soda lime
- (c) Increase the pH of soda lime (d) Take part in reaction with NaOH

42) The pH of a solution of HCl is 4. This shows that the molarity of the solution is

- (a) 4.0M (b) 0.4 (c) 0.0001M (d) 0.001M

- 43) A milkman added a small pinch of baking soda to fresh milk which had pH close to 6. As a result, pH of the medium
- (a) became close to 2 (b) became close to 4 (c) did not undergo any change
(d) became close to 8
- 44) In which of the following pairs, both are acidic salts?
- (a) KCl, KNO₃ (b) Na₂SO₄, K₂SO₄ (c) CH₃COONa, K₂CO₃ (d) CuSO₄, AgNO₃
- 45) The compound used for neutralisation of excess HCl in the stomach is
- (a) NaHCO₃ (b) Mg(OH)₂ (c) Both (d) None of these
- 46) Which of the following is incorrectly matched?
- (a) Tomato - tartaric acid (b) Citrus fruits - citric acid (c) Ant sting - methanoic acid
(d) Curd - lactic acid
- 47) The aqueous solution of which of the following salt will have higher OH⁻ ions?
- (a) NaCl (b) Na₂SO₄ (c) CH₃COONa (d) None of these
- 48) Which one of the following can be used as an acid-base indicator by a visually impaired student?
- (a) Litmus (b) Vanilla essence (c) Turmeric (d) Petunia leaves
- 49) Which of the following phenomenon occur when a small amount of acid is added to water?
- (i) Ionisation (ii) Dilution (iii) Neutralisation (iv) Salt formation
- (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)
- 50) Which of the following substances will not give carbon dioxide on treatment with dilute acid?
- (a) Marble (b) Limestone (c) Lime (d) Baking soda
- 51) The chemical formula of caustic potash is
- (a) NaOH (b) Ca(OH)₂ (c) NH₄OH (d) KOH
- 52) Substances exposed to atmosphere at ordinary temperature, lose their water of crystallisation are called as
- (a) hygroscopy (b) efflorescence (c) deliquescence (d) all of these
- 53) Identify the substance, having the property of deliquescence
- (a) gypsum (b) hydrated calcium chloride (c) quick lime (d) conc. sulphuric acid
- 54) The composition of aqua regia is
- (a) conc. H₂SO₄ and conc. HCl in ratio of 1 : 3 (b) conc. HNO₃ and conc. HCl in ratio of 1 : 3
(c) conc. HNO₃ and conc. HCl in ratio of 3 : 1
(d) conc. H₂SO₄ and conc. HNO₃ in ratio of 3 : 1
- 55) An element 'X' forms a solid oxide which dissolves in water forming solution which turns blue litmus paper red, 'X' is
- (a) Ca (b) Cu (c) Fe (d) P
- 56) Soda-acid fire extinguishes the fire by
- (a) cutting the supply of air (b) raising ignition temperature
(c) removing combustible substance (d) none of these

57) The formula of washing soda is

- (a) NaHCO_3 (b) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ (c) Na_2CO_3 (d) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

58) The substance which on treating with chlorine, yields bleaching powder is

- (a) quick lime (b) limestone (c) slaked lime (d) gypsum

59) If tartaric acid is not added in baking powder, the cake will taste bitter due to the presence of

- (a) sodium hydrogen carbonate (b) sodium carbonate (c) carbon dioxide
(d) same unreacted tartaric acid

60) An aqueous solution has $[\text{H}^+]$ ion concentration = $1.0 \times 10^{-7} \text{ mol L}^{-1}$. Its pH value is

- (a) +7 (b) -7 (c) 0.70 (d) 10^{-7}

61) Milk of magnesia is

- (a) solid magnesium oxide (b) insoluble magnesium hydroxide
(c) soluble magnesium hydroxide (d) insoluble magnesium carbonate

62) The pH of human blood varies between

- (a) 7.12 to 7.36 (b) 7.36 to 7.42 (c) 7.42 to 7.50 (d) 7.25 to 7.42

63) The difference of molecules of water in gypsum and Plaster of Paris is

- (a) $5/2$ (b) 2 (c) $3/2$ (d) $1/2$

64) Which of the following does not form an acidic salt?

- (a) Nitric acid (b) Carbonic acid (c) Hydrochloric acid (d) Sulphuric acid

31 x 1 = 31

65) **Assertion:** The colour of litmus solution is purple.

Reason: The litmus solution is neutral.

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false

66) **Assertion:** Onion and clove can be used to detect the acids and bases.

Reason: These are called olfactory indicators

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false

67) **Assertion:** Aqua regia, is a freshly prepared mixture of concentrated hydrochloric acid and concentrated nitric acid

Reason: The two acids (hydrochloric acid and concentrated nitric acid are mixed in the ratio of 3: 1 respectively)

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false

68) **Assertion:** Limestone, chalk and marble are different forms of calcium carbonate

Reason: It reacts with acids to give a carbonate salt, carbon dioxide and water.

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

69) **Assertion:** Milk is basic in nature

Reason : The pH of curd is 6

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

70) **Assertion:** KCl is a salt with potassium and chloride ions

Reason: It can be prepared by using hydrochloric acid and potassium hydroxide

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false.

71) **Assertion:** Lime juice has sour taste while lime water is bitter

Reason: Lime juice is an acid and lime water is a base

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

72) **Assertion:** The formula of oxide of nitrogen is N_2O_5 and H_2O is oxide of hydrogen.

Reason: N_2O_5 is acidic oxide. Na_2O is basic oxide.

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

73) **Assertion:** Acids should be used carefully

Reason: All acids are corrosive.

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

74) **Assertion:** NaHCO_3 is a basic salt.

Reason: It is a salt of strong base, NaOH and weak acid, H_2CO_3 .

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

75) **Assertion:** All non metal oxides are acidic.

Reason: They dissolve in water to form acids.

Codes

- (a) If both assertion and reason are true and the reason is correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (c) If assertion is true and reason is false.
- (d) If both assertion and reason are false

76) **Assertion:** Calcium sulphate hemihydrate, $\frac{1}{2}\text{CaSO}_4 \cdot \text{H}_2\text{O}$ is called plaster of Paris.

Reason: Plaster of Paris is used for producing moulds for pottery and ceramics and casts of statues.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

77) **Assertion:** Phosphoric acid is a weak acid.

Reason: Phosphoric acid when dissolved in water dissociates partially and produces very little H^+ ions.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

78) **Assertion:** Antacids neutralize the effect of extra acid produced in the stomach during indigestion and thus provide relief.

Reason: Antacids are mild bases.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

79) **Assertion:** HCl is a stronger acid than acetic acid.

Reason: On dissociation, HCl yields lesser hydrogen ions for the same concentration as compared to acetic acid.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

80) **Assertion:** pH = 7 signifies pure water.

Reason: pH of acetic acid is greater than 7.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

81) **Assertion:** pH of ammonium nitrate solution is acidic.

Reason: Solution of a salt of weak base and strong acid is acidic.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

82) **Assertion:** Acetic acid does not act as an acid in benzene solution.

Reason: Benzene is non-polar.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

83) **Assertion:** Bleaching powder reacts with dilute acids to evolve chlorine.

Reason: The chlorine liberated by the action of dilute acids on bleaching powder is called available chlorine.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

84) **Assertion:** Sodium carbonate pentahydrate is also known as washing soda.

Reason: Chief raw materials for the manufacture of washing soda are NH_3 , NaCl and CaCO_3 .

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

85) **Assertion:** Common salt is used for the preparation of many chemicals such as sodium hydroxide, bleaching powder, baking soda, washing soda etc.

Reason: Main source of sodium chloride is sea water.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

86) **Assertion:** AlCl_3 is a basic salt.

Reason: AlCl_3 is a salt of strong acid and a weak base.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

87) **Assertion:** Baking soda is prepared by chlor-alkali process.

Reason: Brine decomposes to sodium hydroxide on passing electricity through it.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

88) **Assertion:** Salt of KNO_3 is formed by strong base and weak acid.

Reason: Salt of NH_4Cl is formed by weak base and strong acid.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

89) **Assertion:** Strength of the acid or base decreases with dilution.

Reason: Ionization of an acid or a base increases with dilution.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

90) **Assertion:** Higher the H^+ ion concentration, lower is the pH value.

Reason: The pH of a neutral solution = 7, that of a basic solution < 7 and that of an acidic solution > 7.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

91) **Assertion:** CH_3COOH is used as vinegar in cooking and food preservatives.

Reason: Strong acids are those acids which ionise almost completely in aqueous solution and hence produce a large amount of H^+ ions.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

92) **Assertion:** Tooth decay starts when the pH of the mouth is lower than 5.5.

Reason: Enamel starts corroding below 5.5 pH

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

93) **Assertion:** The chemical name of bleaching powder is calcium oxychloride.

Reason: Bleaching powder is used as an oxidising agent in chemical industries

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

94) **Assertion:** The process of dissolving an acid or a base in water is highly exothermic reaction.

Reason: Water must always be added slowly to acid with constant stirring.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

95) **Assertion:** Phenolphthalein is an acid-base indicator.

Reason: Phenolphthalein gives different colours in acidic and basic medium.

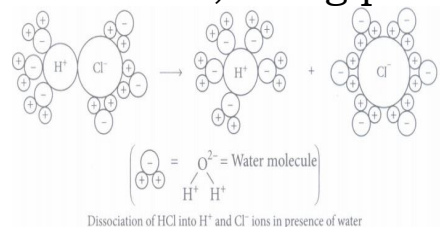
Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

96) The acidic behaviour of acids is due to the presence of hydrogen ion (H^+) ions in them. They produce hydrogen ions in the presence of water. Water is a polar solvent and this property of water helps in weakening the bond between the ions and makes them soluble. Hence, acids and bases produce ions in aqueous solutions.

It may be noted that a dry HCl gas or a solution of hydrogen chloride in organic, nonpolar solvents like toluene or benzene do not show acidic properties. This is because hydrogen chloride does not undergo ionization in toluene.

The reason why HCl splits into H^+ and Cl^- ions in presence of water lies in the fact that water molecules, being polar, pull the H^+ and Cl^- ions apart and thus, the bond in HCl is broken



(i) Identify the wrong statement.

(a) Higher the hydronium ion concentration, lower is the pH value

(b) Universal indicator is used to judge how strong a given acid or base is

(c) As the pH value increases from 7 to 14, it represents increase in H^+ ion concentration in the solution

(d) Value less than 7 on the pH scale represents an acidic solution

(ii) If the pH of a solution is 8, then its $[\text{H}^+]$ ion is

(a) $\log 10^{-8}$ (b) 10^8 (c) 10^{-8} (d) 8

(iii) In terms of acidic strength, which one of the following is in the correct increasing order?

(a) Water < Acetic acid < (b) Water < Hydrochloric

Hydrochloric acid acid < Acetic acid

(c) Acetic acid < Water < (d) Hydrochloric acid <

Hydrochloric acid Water < Acetic acid

(iv) Which of the following compounds does not give H^+ ions in aqueous solution?

(a) H_3PO_4 (b) $\text{C}_2\text{H}_5\text{OH}$ (c) H_2CO_3 (d) CH_3COOH

(v) Four solutions labelled as P, Q, R and S have pH values 1, 9, 3 and 13 respectively.

Which of the following statements about the given solutions is incorrect?

(a) Solution P has higher concentration of hydrogen ions than solution R.

(b) Solution Q has lower concentration of hydroxide ions than solution S.

(c) Solutions P and Q will turn red litmus solution blue.

(d) Solution P is highly acidic while solution Q is weakly basic.

97) A compound, X of sodium forms a white powder. It is a constituent of baking powder and is used in some antacids. When heated it gives a compound, Y which is anhydrous and absorbs water to become a hydrated salt. When this salt is kept in open air, it loses water molecules in a process called efflorescence. When dissolved in water it forms a strong base and a weak acid, Z.

(i) What is the compound, X?

(a) NaHCO_3 (b) Na_2CO_3 (c) NaOH (d) NaCl

(ii) The compound, Y is

(a) NaHCO_3 (b) Na_2CO_3 (c) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (d) NaCl

(iii) What is the nature of the solution formed by dissolving Y in water?

(a) Alkaline (b) Acidic (c) Neutral (d) It remains insoluble

(iv) Identify the compound, Z.

(a) CO_2 (b) H_2CO_3 (c) NaOH (d) H_2O

(v) Sodium carbonate is a basic compound because it is a salt of a

**(a) strong acid and strong base (b) weak acid and weak base
(c) strong acid and weak base (d) weak acid and strong base**

98) Sodium chloride obtained from sea water or from lakes contains many impurities such as sulphates of sodium and magnesium along with chlorides of calcium and magnesium. The chlorides of calcium and magnesium are particularly undesirable on account of their deliquescent nature.

For its purification, common salt is dissolved in minimum quantity of water to get a saturated solution from which insoluble impurities are filtered off. Then hydrogen chloride gas is passed through the saturated solution and the crystals of pure NaCl separate out. The soluble impurities remain in the mother liquor. The crystals are filtered, washed and dried.

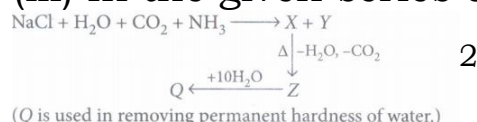
(i) Select the correct statement regarding salt NaCl .

**(a) Pure NaCl is hygroscopic in nature
(b) It is soluble in alcohol
(c) Pure NaCl is not hygroscopic, it shows hygroscopic nature due to impurities
(d) It is a brown crystalline solid**

(ii) Nature of aqueous solution of common salt is

(a) acidic (b) alkaline (c) basic (d) neutral

(iii) In the given series of reactions, Y and Z respectively are



(Q is used in removing permanent hardness of water.)

**(a) NaHCO_3 , (b) NH_4Cl , (c) Na_2CO_3 , (d) Na_2CO_3 ,
 NaOCl_2 Na_2CO_3 NH_4Cl NaHCO_3**

(iv) Which of the following compounds is alkaline in aqueous medium?

(a) Na_2CO_3 (b) NaCl (c) H_2CO_3 (d) CuSO_4

(v) Some statements regarding salt NaCl are given below

(I) It is prepared by chlor-alkali process
(II) It is a white crystalline substance
(III) It also exists in the form of rocks and is called rock salt
(IV) It is a neutral salt, pH value of NaCl is 7

(a) II and III only (b) III and IV only (c) I and II only (d) II, III and IV only

99) Chemically, Plaster of Paris (POP) is calcium sulphate hemihydrate, i.e., containing half molecule of water of crystallisation. It is represented by the formula, $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$. Half molecule of water of crystallisation means that one water molecule is shared by two formula units of CaSO_4 . Hence, we also represent its formula as $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$. The name, plaster of Paris, was given to this compound because for the first time, it was made from gypsum which was mainly found in Paris.

(i) The difference of water molecules in gypsum and plaster of Paris is

(a) 5/2 (b) 2 (c) 1/2 (d) 3/2

(ii) Plaster of Paris hardens by

(a) giving off CO_2 (b) changing into CaCO_3

(c) combining with water (d) giving out water

(iii) Which of the following statements is incorrect?

(a) Plaster of Paris is used to ornate designs on walls and ceilings

(b) On heating gypsum above 373 K, CaSO_4 is obtained

(c) Dead burnt plaster is $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(d) Setting of plaster is due to its hydration into gypsum

(iv) Select the incorrect statement with respect to gypsum

(a) It is slightly soluble in water

(b) It is also known as alabaster

(c) On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate

(d) Chemical formula of gypsum is $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$

(v) Plaster of Paris is obtained by

(a) adding water to calcium sulphate.

(b) adding sulphuric acid to calcium hydroxide

(c) heating gypsum to a very high temperature

(d) heating gypsum to 100°C

100) pH is quite useful to us in a number of ways in daily life. Some of its applications are:

Control of pH of the soil: Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of H^+ and OH^- . The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials

Regaining shine of a tarnished copper vessel by use of acids: A copper vessel gets tarnished due to formation of an oxide layer on its surface. On rubbing lemon on the vessel, the surface is cleaned and the vessel begins to shine again. This is due to the fact that copper oxide is basic in nature, which reacts with the acid (citric acid) present in lemon to form a salt (copper citrate) which is washed away with water. As a result, the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed

(i) When black copper oxide placed in a beaker is treated with dilute HCl, its colour changes to

**(a) white (b) (c) bluish (c) bluish (d) no
dark red green green change**

(ii) P is an aqueous solution of acid and Q is an aqueous solution of base. When these two are diluted separately, then

**(a) pH of P increases while that of Q
decreases till neutralisation**

**(b) pH of P decreases while that of Q
increases till neutralisation**

(c) pH of both P and Q decrease

(d) pH of both P and Q increase

(iii) Which of the following acids is present in bee sting?

**(a) Formic acid (c)
Citric acid**

(b) Acetic acid

(b) Acetic acid

**(d) Hydrochloric
acid**

(iv) Sting of ant can be cured by rubbing the affected area with soap because

**(a) it contains oxalic acid which neutralises
the effect of formic acid**

**(b) it contains aluminium hydroxide which
neutralises the effect of formic acid**

**(c) it contains sodium hydroxide which
neutralises the effect of formic acid**

(d) none of these

(v) The pH of soil X is 7.5 while that of soil Y is 4.5. Which of the two soils, should be treated with powdered chalk to adjust its pH?

**(a) X (b) Y (c) Both X (d) None of
only only and Y these**

101) Baking powder produces carbon dioxide on heating, so it is used in cooking to make the batter spongy. Although, baking soda also produces CO_2 on heating, but it is not used in cooking because on heating, baking soda produces sodium carbonate along with carbon dioxide. Sodium carbonate, thus, produced, makes the taste bitter. Baking powder is the mixture of baking soda and a mild edible acid. Generally, tartaric acid is mixed with baking soda to make baking powder. When baking powder is heated, NaHCO_3 decomposes to give CO_2 which makes bread and cake fluffy. Tartaric acid helps to remove bitter taste due to formation of sodium tartrate.



Baking soda Tartaric acid Carbon dioxide Sodium tartrate

(i) On passing excess CO_2 gas in aqueous solution of sodium carbonate, the substance obtained is

- (a) **NaOH** (b) **NaHCO_3**
 (c) **$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$** (d) **$\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$**

(ii) When sodium hydrogen carbonate is added to acetic acid, it evolves a gas. Which of the following statements are true about the gas evolved?

- (I) It turns lime water milky
 (II) It extinguishes a burning splinter
 (III) It dissolves in a solution of sodium hydroxide
 (IV) It has a pungent odour

- (a) **(I) and (II)** (b) **(I), (II) and (III)**
 (c) **(II), (III) and (IV)** (d) **(I) and (IV)**

(iii) Select the correct statement regarding sodium hydrogen carbonate.

- (a) **CO and CO_2 are produced during the heating of NaHCO_3**
 (b) **It is insoluble in water.**
 (c) **It is used in soda-acid fire extinguishers.**
 (d) **All of these**

(iv) Acetic acid was added to a solid X kept in a test tube. A colourless and odourless gas was evolved. The gas was passed through lime water which turned milky. It was concluded that

- (a) **solid X is sodium hydroxide and the gas evolved is CO_2**
 (b) **solid X is sodium bicarbonate and the gas evolved is CO_2**
 (c) **solid X is sodium acetate and the gas evolved is CO_2**
 (d) **solid X is sodium chloride and the gas evolved is CO_2**

(v) Which of the following statements are correct regarding baking soda?

- (I) Baking soda is sodium hydrogen carbonate
 (II) On heating, baking soda gives sodium carbonate
 (III) It is used for manufacture of soap
 (IV) It is an ingredient of baking powder

- (a) **I and IV only** (b) **I, II and III only**
 (c) **I, II and IV only** (d) **I, II, III and I**

102) Bleaching powder is also known as chloride of lime. It is a solid and yellowish white in colour. Bleaching powder can be easily identified by the strong smell of chlorine. When calcium hydroxide (slaked lime) reacts with chlorine, it gives calcium oxychloride (bleaching powder) and water is formed. Aqueous solution of bleaching powder is basic in nature. The material to be bleached is first passed through solution of NaOH to remove greasy matter. Then it is passed through aqueous solution of bleaching powder and very dil. HCl solution. HCl reacts with bleaching powder to liberate nascent oxygen which bleaches material.

(i) Bleaching powder is used as

(a) bleaching agent in textile, paper and jute industry

(b) disinfectant for water to make water free of germs

(c) oxidising agent in many industries

(d) all of these

(ii) Bleaching powder is also known as

(a) calcium oxychloride

(b) calcium

hypochlorite

(c) chloride of lime

(d) all of these.

(iii) Bleaching powder gives smell of chlorine because it

(a) is unstable

(b) gives chlorine on

exposure to atmosphere

(c) is a mixture of chlorine and slaked lime

(d) contains excess of chlorine

(iv) Select the correct statement(s) regarding bleaching powder.

(a) It is pale yellow powder having smell of chlorine

(b) It is sparingly soluble in water and gives milky suspension when dissolved in water

(c) As bleaching powder gives nascent oxygen, it shows bleaching property

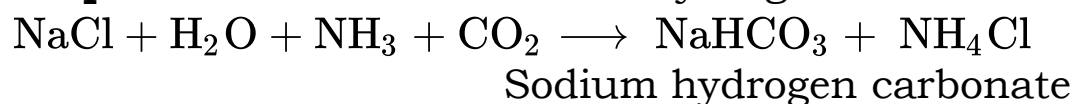
(d) All of these

(v) Identify the product 'X' in the given reaction $\text{Ca(OH)}_2 + \text{Cl}_2 \longrightarrow X + \text{H}_2\text{O}$

(a) CaOCl_2 (b) CaCl_2 (c) $\text{Ca(ClO}_3)_2$ (d) CaCO_3

103) The preparation of washing soda is carried out through following steps:

Step-I: Manufacture of sodium hydrogen carbonate:



Step-II: Thermal decomposition of sodium hydrogen carbonate: When dry crystals of sodium hydrogen carbonate are heated strongly, they decompose to form anhydrous sodium carbonate (soda ash). $2\text{NaHCO}_{3(s)} \longrightarrow \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}$

Step-III: Recrystallisation of sodium carbonate: Sodium carbonate thus obtained is



Anhydrous

Washing soda

sodium carbonate

(i) Some of the uses of washing soda are given below:

(I) It is used for removing permanent hardness of water

(II) It is used in glass industry

(III) It is used in paper industry

(IV) It is used in the manufacture of sodium compounds such as borax

Select the correct option regarding uses of washing soda

(a) (I) and (II) only (b) (II) and (III) only

(c) (II) and (IV) only (d) (I), (II), (III) and (IV)

(ii) What products will be formed along with water when sodium carbonate reacts with dilute hydrochloric acid?

(a) CO and NaCl (b) Na and CO₂

(c) NaCl and CO₂ (d) Na and CO

(iii) Chief raw materials for the manufacture of washing soda are

(a) sodium chloride, ammonia and limestone

(b) ammonia, sodium hydrogen carbonate and copper sulphate

(c) sodium hydroxide, calcium chloride and ammonia

(d) calcium chloride, sodium chloride and copper sulphate.

(iv) What is the action of sodium carbonate on litmus paper?

(a) Turns red (b) Turns blue (c) No change (d) Both

litmus blue litmus red on litmus (a) and (b)

(v) What products will be obtained when solution of sodium carbonate and slaked lime is heated?

(a) NaOH and CaCl₂ (b) CaCO₃ and NaOH

(c) NaHCO₃ and NaOH (d) NaCl and CaCO₃

104) "Indicator is a chemical compound which is added to the solution in very small amount to detect its acidic or basic nature:" As they show colour change in acidic and basic medium, they are also called acid-base indicators. In other words, "an acid-base indicator is that substance which possesses one colour in acidic medium and a different colour in alkaline medium." Indicators, basically, are coloured organic substances either extracted from plants (natural indicators) or synthesised in the laboratory (synthetic indicators). A few common acid base indicators are: Litmus, phenolphthalein, methyl orange etc. In addition to these there are some naturally occurring substances which have different smell in acidic and basic medium. These substances are called olfactory indicators.

(i) Which one of the following will turn red litmus blue?

- (a) **Vinegar** (b) **Baking soda solution** (c) **Lemon juice** (d) **Soft drinks**

(ii) A solution turns blue litmus red. The pH of the solution is probably

- (a) **8** (b) **10** (c) **12** (d) **6**

(iii) A solution in test tube 'A' turns red litmus blue, evolves hydrogen gas on reaction with zinc and does not react with sodium carbonate. Whereas, solution in test tube 'B' turns blue litmus red, liberates hydrogen gas on reaction with zinc and evolves carbon dioxide gas with sodium carbonate. Identify 'A' and 'B'

- (a) **'A' is an acid, 'B' is a base** (b) **'A' is a base, 'B' is an acid**

- (c) **Both 'A' and 'B' are bases** (d) **Both 'A' and 'B' are acids**

(iv) Select the incorrect option

Indicator	Colour in acidic medium	Colour in basic medium
(a) Litmus (Purple)	Red	Blue
(b) Flower of hydrangea plant (Blue)	Red	Green
(c) Red cabbage juice (Purple)	Red or Pink	Green
(d) Turmeric Juice (Yellow)	Yellow	Reddish brown

(v) Which one of the following can be used as an acid-base indicator by visually impaired student?

- (a) **Litmus** (b) **Turmeric** (c) **Vanilla essence** (d) **Methyl orange**

105) Acids turn blue litmus red but have no effect on red litmus. Bases turn red litmus blue but have no effect on blue litmus. The sample in which phenolphthalein remains colourless while methyl orange changes to pink/ red are acids while the samples in which phenolphthalein colour changes to pink and methyl orange changes to yellow are bases. Some observations of different sample solutions in litmus, phenolphthalein and methyl orange indicator are given in the table.

Sample solution	Red litmus solution	Blue litmus solution	Phenolphthalein indicator	Methyl orange indicator
HCl	No colour change	Red	Colourless	Red/ Pink
H ₂ SO ₄	No colour change	Red	Colourless	Red/ Pink
HNO ₃	No colour change	Red	Colourless	Red/ Pink
CH ₃ COOH	No colour change	Red	Colourless	Red/ Pink