

- Q1.** Identify the correct representation of reaction occurring during chloralkali process
- (a)  $2\text{NaCl}(l) + 2\text{H}_2\text{O}(l) \longrightarrow 2\text{NaOH}(l) + \text{Cl}_2(g) + \text{H}_2(g)$   
(b)  $2\text{NaCl}(aq) + 2\text{H}_2\text{O}(aq) \longrightarrow 2\text{NaOH}(aq) + \text{Cl}_2(g) + \text{H}_2(g)$   
(c)  $2\text{NaCl}(aq) + 2\text{H}_2\text{O}(l) \longrightarrow 2\text{NaOH}(aq) + \text{Cl}_2(aq) + \text{H}_2(aq)$   
(d)  $2\text{NaCl}(aq) + 2\text{H}_2\text{O}(l) \longrightarrow 2\text{NaOH}(aq) + \text{Cl}_2(g) + \text{H}_2(g)$
- Q2.** What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- (i) The temperature of the solution increases.  
(ii) The temperature of the solution decreases.  
(iii) The temperature of the solution remains the same.  
(iv) Salt formation takes place.
- (a) (i) only                      (b) (i) and (iii)                      (c) (ii) and (iii)                      (d) (i) and (iv)
- Q3.** Which of the following is used for dissolution of gold?
- (a) Hydrochloric acid    (b) Sulphuric acid    (c) Nitric acid    (d) Aqua regia
- Q4.** Which of the following substance will not give carbon dioxide on treatment with dilute acid?
- (a) Marble                      (b) Limestone                      (c) Baking soda                      (d) Lime
- Q5.** Sodium hydrogencarbonate 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)
- Q6.** Which of the following are present in a dilute aqueous solution of hydrochloric acid?
- (a)  $\text{H}_3\text{O}^+ + \text{Cl}^-$                       (b)  $\text{H}_3\text{O}^+ + \text{OH}^-$                       (c)  $\text{Cl}^- + \text{OH}^-$                       (d) Unionised HCl
- Q7.** 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                      (b) Hydrochloric acid < Water < Acetic acid
- Q8.** 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)
- Q9.** 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)

- Q10.** 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  $\text{Cl}^-$  ions from the evolved gas
- Q11.** 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 hydrogencarbonate.  
(c) After washing with plenty of water apply solution sodium hydroxide on the hand.  
(d) Neutralise the acid with a strong alkali.
- Q12.** 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
- Q13.** 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
- Q14.** 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
- Q15.** Which of the following is acidic in nature?
- (a) Lime juice (b) Human blood (c) Lime water (d) Antacid
- Q16.** To protect tooth decay we are advised to brush our teeth regularly. The nature of the tooth paste commonly use is
- (a) acidic (b) Neutral (c) basic (d) corrosive
- Q17.** One of the constituents of baking powder is sodium hydrogencarbonate, the other constituent is
- (a) hydrochloric acid (b) tartaric acid (c) acetic acid (d) sulphuric acid
- Q18.** 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)
- Q19.** 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
- Q20.** Which of the following salts does not contain water of crystallisation?
- (a) Blue vitriol (b) Baking soda (c) Washing soda (d) Gypsum
- Q21.** 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
- Q22.** Which of the following statements are 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.

**Q23.** Calcium phosphate is present in tooth enamel. Its nature is

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

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- S1.** (d) The correct physical states of NaCl, H<sub>2</sub>O, NaOH, Cl<sub>2</sub> are (aq) (l), (aq), (g) and (g) respectively.
- S2.** (d) Mixture of an acid and a base is an exothermic process and is accompanied by the formation of a salt.
- S3.** (d) Aqua regia which is a mixture of HCl and HNO<sub>3</sub> is used to dissolve gold.
- S4.** (d) Carbonates and hydrogencarbonates react with dil. HCl to give CO<sub>2</sub>. Lime is Ca(OH)<sub>2</sub>.
- S5.** (b) The gas evolved is CO<sub>2</sub> which turns lime water milky extinguishes fire and dissolves in NaOH solution forming Na<sub>2</sub>CO<sub>3</sub>.
- S6.** (a) Hydrochloric acid ionises as follows:  
$$\text{HCl} \longrightarrow \text{H}^+ + \text{Cl}^-$$
  
H<sup>+</sup> ions combine with water molecules to form H<sub>3</sub>O<sup>+</sup>. Therefore, the ions present in dilute aqueous solution of hydrochloric acid are H<sub>3</sub>O<sup>+</sup> and Cl<sup>-</sup>.
- S7.** (a) Hydrochloric acid is a strong acid (inorganic), acetic acid is a weak acid (organic).
- S8.** (d) Acidic solutions have pH less than 7 and basic solutions have pH more than 7.
- S9.** (c) Although HCl is a covalent compound but it ionises in the solution. H<sup>+</sup> combines with water to give hydronium ion.
- S10.** (c) Calcium chloride has the property of absorbing water vapours.
- S11.** (b) Sodium hydroxide is corrosive to skin. Therefore, it cannot be applied. Paste of sodium hydrogencarbonate is weakly basic and safe to apply on hand after washing with water.
- S12.** (d) As the solution turns red litmus solution blue, it must be basic. To reverse the change, we must add an acid.
- S13.** (c) Vanilla essence makes use of smell. Therefore, it can be used by a visually impaired student.
- S14.** (a) Gastric juices are acidic in nature, hence the pH is less than 7.
- S15.** (a) Out of the substances given, only lime juice is acidic in nature.
- S16.** (c) To fight acidity in the mouth, we require a toothpaste which is basic.
- S17.** (b) To decompose sodium hydrogencarbonate, we require an acid. Since it is used in food, we use a mild organic acid which is not toxic to human system.
- S18.** (c) We can prepare washing soda and baking soda from common salt.
- S19.** (d) Salts of weak acid and strong base behave as basic salts.
- S20.** (b) Blue vitriol is CuSO<sub>4</sub>·5H<sub>2</sub>O, washing soda is Na<sub>2</sub>CO<sub>3</sub>·10H<sub>2</sub>O and gypsum is CaSO<sub>4</sub>·2H<sub>2</sub>O. Baking soda does not contain water of crystallisation.
- S21.** (d) Only a basic solution will change the colour of pH paper to greenish-blue.
- S22.** (c) Acids possess sour taste and turn blue litmus paper red.

**S23. (a)** Calcium phosphate is a salt of strong base  $\text{Ca(OH)}_2$  and weak acid, phosphoric acid. Therefore, it is basic.

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