2. Acids, Bases and Salts - Board Exam Questions (1 Mark)

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1 Mark Questions (MCQ)

1) *Which one of the following can be used as an acid-base indicator by a visually impaired (blind) student?*
(a) Turmeric (b) Vanilla essence (c) Methyl orange (d) Litmus

2) *The natural sources of oxalic acid, lactic acid and methanoic acid respectively are:*
(a) tomato, curd, ant-sting (b) tomato, orange, nettle-sting
(c) orange, milk, ant-sting (d) orange, sour milk, nettle-sting

3) *A metal carbonate reacts with a solution X which forms a salt, water and a gas Y. What are X and Y?*
(a) X – Sodium hydroxide, Y – Carbon dioxide
(b) X – Sodium hydroxide, Y – Hydrogen
(c) X – Hydrochloric acid, Y – Carbon dioxide
(d) X – Hydrochloric acid, Y – Hydrogen

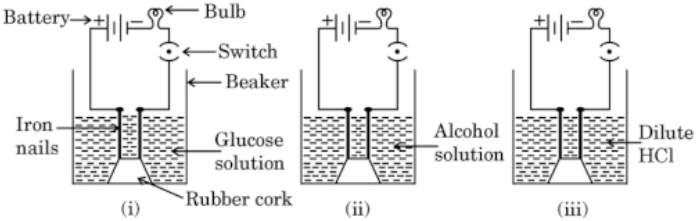
4) *The pH of the gastric juices released during digestion is:*
(a) Less than 7 (b) More than 7 (c) Equal to 7 (d) Equal to 0

5) *Baking powder is a mixture of:*
(a) Sodium carbonate + Acetic acid
(b) Sodium carbonate + Tartaric acid
(c) Sodium hydrogen carbonate + Tartaric acid
(d) Sodium hydrogen carbonate + Acetic acid

6) *To a small amount of copper oxide in a beaker, when we add dilute hydrochloric acid slowly with stirring, the change in the colour of the solution is due to the formation of:*
(a) Copper(II) oxide, which is black in colour

(b) Copper(I) chloride, which is blue in colour
(c) Copper(II) chloride, which is blue-green in colour
(d) Copper(I) oxide, which is black in colour

7) *In which case/cases will the bulb glow considering that all other connections of electric circuit are complete and working?*



(a) Case (i) only (b) Case (ii) only
(c) Cases (ii) and (iii) (d) Case (iii) only

8) *When zinc reacts with NaOH, the product formed is:*
(a) Na_2O (b) ZnO (c) Na_2ZnO_2 (d) $Zn(OH)_2$

9) *An aqueous solution turns red litmus blue. Excess addition of which of the following solution would reverse the change?*
(a) Sodium hydroxide (b) Hydrochloric acid (c) Baking soda (d) Slaked lime

10) *How will you protect yourself from the heat generated while diluting a concentrated acid?*
(a) By adding acid to water with constant stirring
(b) By adding water to acid with constant stirring
(c) By adding water to acid followed by base
(d) By adding base to acid with constant stirring

11) *Study the following table and select the correct option:*
(a) Salt: NaCl, Acid used: HCl, Base used: NaOH, Nature of Salt: Basic
(b) Salt: Na_2CO_3, Acid used: H_2CO_3, Base used: NaOH, Nature of Salt: Neutral

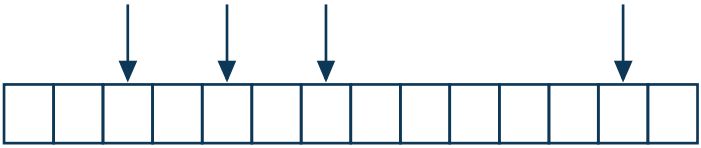
(c) Salt: Na_2SO_4, Acid used: H_2SO_4, Base used: NaOH, Nature of Salt: Acidic
(d) Salt: CH_3COONa, Acid used: CH_3COOH, Base used: NaOH, Nature of Salt: Basic

12) *Four solutions, namely fructose, ethanol, hydrochloric acid and sodium hydroxide filled in four separate beakers are connected one by one in an electric circuit with a bulb. The solutions in which the bulb will glow when current is passed are:*
(a) ethanol and hydrochloric acid
(b) fructose and ethanol
(c) fructose and sodium hydroxide
(d) hydrochloric acid and sodium hydroxide

13) *Rishita summarizes the chlor-alkali process in the following table. Identify the options that are correctly matched.*
Option: Product, Formed, Use
I: Hydrogen, At cathode, Used as a fuel
II: Chlorine, At anode, Used to make margarines
III: Sodium Hydroxide, Near cathode, To make soap
IV: Sodium Hydroxide, Near anode, To make bleaching powder
(a) I, II and III (b) I and III (c) II and IV (d) I, II, III and IV

14) *Which of the following salts contain water of crystallisation: (i) Plaster of Paris, (ii) Washing soda, (iii) Baking soda and (iv) Gypsum.*
(a) (i), (ii) and (iii) (b) (i), (iii) and (iv)
(c) (ii), (iii) and (iv) (d) (i), (ii) and (iv)

15) *The following table shows the pH values of four solutions A, B, C and D on a pH scale:*
The solutions A, B, C and D respectively are of a



(a) Strong acid, weak acid, neutral, strong base
(b) Weak acid, neutral, weak base, strong base
(c) Weak acid, neutral, strong base, weak base
(d) Weak acid, neutral, strong base, strong acid

16) *Consider the following reactions:*
(i) Dilute hydrochloric acid reacts with sodium hydroxide.
(ii) Magnesium oxide reacts with dilute hydrochloric acid.
(iii) Carbon dioxide reacts with sodium hydroxide.
It is found that in each case:
(a) Salt and water is formed (b) Neutral salts are formed
(c) Hydrogen gas is formed (d) Acidic salts are formed

17) *The warning sign shown in the given figure must invariably be displayed/pasted on the containers which contain hydroxide of:*
Figure: triangular "corrosive" hazard sign: liquid dripping from test tubes onto a hand and a surface



(a) Aluminium (b) Calcium (c) Sodium (d) Magnesium

18) *The body of human beings works within the pH range of:*
(a) 6.1 to 6.8 (b) 6.5 to 7.3 (c) 7.0 to 7.8 (d) 7.5 to 8.1

19) *Which of the given option represents a family of salts?*
(a) NaCl, Na_2SO_4, $CaSO_4$ (b) K_2SO_4, Na_2SO_4, $CaSO_4$
(c) $NaNO_3$, $CaCO_3$, Na_2CO_3 (d) $MgSO_4$, $CuSO_4$, $MgCl_2$

20) *In order to prepare dry hydrogen chloride gas in humid atmosphere the gas produced is passed through a guard tube (drying tube) which contains:*
(a) Calcium chloride (b) Calcium oxide (c) Calcium hydroxide (d) Calcium carbonate

21) *A common feature observed in the crystals of washing soda, copper sulphate, gypsum and ferrous sulphate is that all*
(a) exhibit basic nature
(b) exhibit acidic nature
(c) have fixed number of molecules of water of crystallisation in one formula unit of these salts
(d) are coloured

22) *A metal, 'X', on treatment with sodium hydroxide liberates a gas 'G'. It also liberates the same gas, 'G' on treatment with dilute sulphuric acid. Based on above information, 'X' and 'G' respectively are*
(a) Copper and Sulphur dioxide (b) Zinc and Sulphur dioxide
(c) Zinc and Hydrogen (d) Copper and Hydrogen

23) *You have three aqueous solutions A, B and C as given below: A - Potassium nitrate; B - Ammonium chloride; C - Sodium carbonate. The ascending order of the pH of these solutions is:*
(a) A < B < C (b) B < C < A (c) C < A < B (d) B < A < C

24) *Juice of tamarind turns blue litmus to red. It is because of the presence of a chemical compound called*
(a) Acetic acid (b) Methanoic acid (c) Oxalic acid (d) Tartaric acid

25) *The water of crystallization is present in (i) Bleaching Powder (ii) Plaster of Paris (iii) Washing Soda (iv) Baking Soda*
(a) (ii) and (iv) (b) (ii) and (iii) (c) (i) and (iii) (d) (i) and (iv)

26) *Methyl orange is added to dilute hydrochloric acid and to aqueous sodium hydroxide. What is the colour of the methyl orange in each solution?*
(a) colour in dilute hydrochloric acid: Orange, colour in aqueous sodium hydroxide: Red
(b) colour in dilute hydrochloric acid: Red, colour in aqueous sodium hydroxide: Yellow
(c) colour in dilute hydrochloric acid: Red, colour in aqueous sodium hydroxide: Orange
(d) colour in dilute hydrochloric acid: Yellow, colour in aqueous sodium hydroxide: Red

27) *Which of the following substances when dissolved in equal volume of water, will have the highest pH value?*
(a) Sulphuric acid (b) Acetic acid
(c) Magnesium hydroxide (d) Sodium hydroxide

28) *When excess of carbon dioxide is passed through lime water, the milkiness disappears because*
(a) water soluble calcium carbonate converts to water soluble calcium bicarbonate
(b) insoluble calcium carbonate converts to water soluble calcium bicarbonate
(c) water soluble calcium carbonate converts to insoluble calcium bicarbonate

(d) insoluble calcium carbonate converts to insoluble calcium bicarbonate

29) *When 2 mL of sodium hydroxide solution is added to few pieces of granulated zinc in a test tube and then warmed, the reaction that occurs can be written in the form of a balanced chemical equation as:*
(a) $NaOH + Zn \rightarrow NaZnO_2 + H_2O$ (b) $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$
(c) $2NaOH + Zn \rightarrow NaZnO_2 + H_2$ (d) $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2O$

30) *Consider the following compounds: $FeSO_4$; $CuSO_4$; $CaSO_4$; Na_2CO_3 The compound having maximum number of water of crystallisation in its crystalline form in one molecule is:*
(a) $FeSO_4$ (b) $CuSO_4$ (c) $CaSO_4$ (d) Na_2CO_3

31) *Select a pair of natural indicator from the following:*
(a) Litmus and methyl orange (b) Turmeric and Litmus
(c) Phenolphthalein and methyl orange (d) Methyl orange and Turmeric

32) *A chemical compound used in glass, soap and paper industries is*
(a) Washing Soda (b) Baking Soda (c) Bleaching Powder (d) Common Salt

33) *An aqueous solution of a salt turns blue litmus to red. The salt could be the one obtained by the reaction of:*
(a) HNO_3 and NaOH (b) H_2SO_4 and KOH (c) CH_3COOH and NaOH (d) HCl and NH_4OH

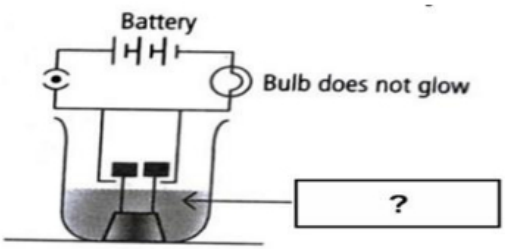
34) *Four solutions, namely glucose, alcohol, hydrochloric acid and sulphuric acid filled in four separate beakers are connected one by one in an electric circuit with a bulb. The solutions in which the bulb will glow when current is passed are:*
(a) Glucose and alcohol (b) Alcohol and hydrochloric acid

(c) Glucose and sulphuric acid (d) Hydrochloric acid and sulphuric acid

35) *The salt present in tooth enamel is:*
(a) Calcium phosphate (b) Magnesium phosphate
(c) Sodium phosphate (d) Aluminium phosphate

36) *An aqueous solution of sodium chloride is prepared in distilled water. The pH of this solution is:*
(a) 6 (b) 8 (c) 7 (d) 3

37) *The solution in the given figure is likely to be*

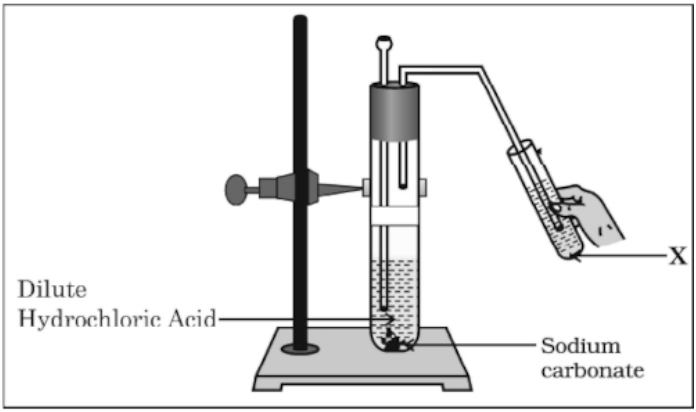


(a) HNO_3 (b) C_2H_5OH (c) H_2SO_4 (d) CO_2 in water

38) *Which among the following is considered as the strongest electrolyte?*
(a) Dilute acid (b) Dilute sugar solution
(c) Glucose solution (d) Ethanol in water

39) *An aqueous solution 'A' turns the phenolphthalein solution pink. On addition of an aqueous solution 'B' to 'A', the pink colour disappears. Which of the following statement is true for the solutions 'A' and 'B'.*
(a) A is strongly basic and B is a weak base
(b) A is strongly acidic and B is a weak acid
(c) A has a pH greater than 7 and B has a pH less than 7
(d) A has a pH less than 7 and B has a pH greater than 7

40) *In the experimental setup given below, it is observed that on passing the gas produced in the reaction in the solution 'X' the solution 'X' first turns milky and then colourless.*
The option that justifies the above stated observation is that 'X' is aqueous calcium hydroxide and



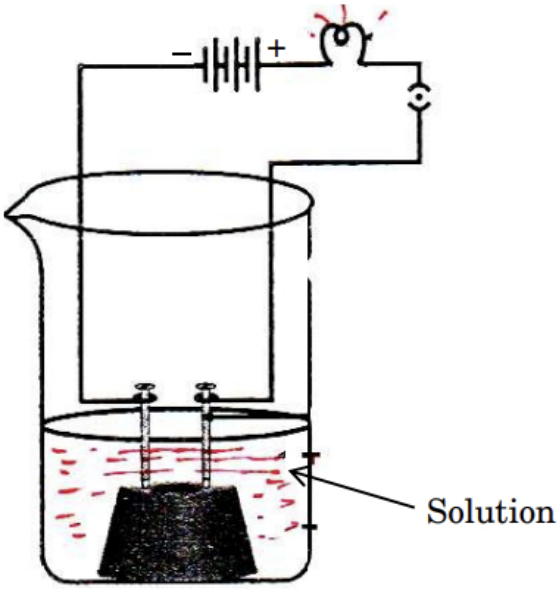
(a) it turns milky due to carbon dioxide gas liberated in the reaction and after sometime it becomes colourless due to formation of calcium carbonate
(b) it turns milky due to formation of calcium carbonate and on passing excess of carbon dioxide it becomes colourless due to formation of calcium hydrogen carbonate which is soluble in water
(c) it turns milky due to passing of carbon dioxide through it. It turns colourless as on further passing carbon dioxide, sodium hydrogen carbonate is formed which is soluble in water
(d) the carbon dioxide liberated during the reaction turns lime water milky due to formation of calcium hydrogen carbonate and after some time it turns colourless due to formation of calcium carbonate which is soluble in water

41) *The table below has information regarding pH and the nature (acidic/basic) of four different solutions. Which one of the options in the table is correct?*

(a) Solution: Lemon juice, Colour of pH paper: Orange, Approximate pH value: 3, Nature of solution: Basic
(b) Solution: Milk of magnesia, Colour of pH paper: Blue, Approximate pH value: 10, Nature of solution: Basic
(c) Solution: Gastric juice, Colour of pH paper: Red, Approximate pH value: 6, Nature of solution: Acidic
(d) Solution: Pure water, Colour of pH paper: Yellow, Approximate pH value: 7, Nature of solution: Neutral

42) *Select washing soda from the following:*
(a) $NaHCO_3$ (b) $Na_2CO_3 \cdot 5H_2O$ (c) $Na_2CO_3 \cdot 10H_2O$ (d) NaOH

43) *In the given experimental set-up, if the experiment is carried out separately with each of the following solutions the cases in which the bulb will glow is/are:*
(i) Dilute hydrochloric acid
(ii) Dilute sulphuric acid
(iii) Glucose solution
(iv) Alcohol



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

44) *When Sodium bicarbonate reacts with dilute hydrochloric acid, the gas evolved is:*
(a) Hydrogen; it gives pop sound with burning match stick
(b) Hydrogen; it turns lime water milky
(c) Carbon dioxide; it turns lime water milky
(d) Carbon dioxide; it blows off a burning match stick with a pop sound

45) *Acid present in tomato is:*
(a) Methanoic acid (b) Acetic acid (c) Lactic acid (d) Oxalic acid

46) *Sodium hydroxide is termed an alkali while Ferric hydroxide is not because:*
(a) Sodium hydroxide is a strong base, while Ferric hydroxide is a weak base
(b) Sodium hydroxide is a base which is soluble in water while Ferric hydroxide is also a base but it is not soluble in water
(c) Sodium hydroxide is a strong base while Ferric hydroxide is a strong acid
(d) Sodium hydroxide and Ferric hydroxide both are strong base but the solubility of Sodium hydroxide in water is comparatively higher than that of Ferric hydroxide

47) *The name of the salt used to remove permanent hardness of water is:*
(a) Sodium hydrogen carbonate ($NaHCO_3$)
(b) Sodium chloride (NaCl)
(c) Sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$)
(d) Calcium sulphate hemihydrate ($CaSO_4 \cdot \frac{1}{2}H_2O$)

48) *Select a pair of olfactory indicators from the following:*
(a) Clove oil and vanilla essence (b) Onion and turmeric

(c) Clove oil and litmus solution (d) Vanilla and methyl orange

49) *Fresh milk has a pH of 6. To delay its curdling, a chemical substance is added to it, which is:*
(a) Sodium carbonate
(b) Baking powder
(c) Sodium hydroxide (Caustic soda)
(d) Baking soda (Sodium hydrogen carbonate)

50) *Hydronium ions are formed by the reaction between:*
(a) Sodium hydroxide and water (b) Calcium chloride and water
(c) Hydrogen chloride gas and water (d) Ethanol and water

51) *Few drops of aqueous solution of ammonium chloride are put on a universal indicator paper. The paper turns pink. Study the following table and choose the correct option.*
(a) Nature: acidic, Ammonium chloride is a salt of ....: weak acid and strong base, Range of pH: less than 7
(b) Nature: basic, Ammonium chloride is a salt of ....: weak acid and strong base, Range of pH: more than 7
(c) Nature: acidic, Ammonium chloride is a salt of ....: strong acid and weak base, Range of pH: less than 7
(d) Nature: basic, Ammonium chloride is a salt of ....: strong acid and strong base, Range of pH: 7

52) *Two salts 'X' and 'Y' are dissolved in water separately. When phenolphthalein is added to these two solutions, the solution 'X' turns pink and the solution 'Y' does not show any change in colour, therefore 'X' and 'Y' are*
(a) (X): Na_2CO_3, (Y): NH_4Cl (b) (X): Na_2SO_4, (Y): $NaHCO_3$
(c) (X): NH_4Cl, (Y): Na_2SO_4 (d) (X): $NaNO_3$, (Y): Na_2SO_4

53) *Mild non-corrosive basic salt is*
(a) $Ca(OH)_2$ (b) NaCl (c) NaOH (d) $NaHCO_3$

54) *The change in colour of the moist litmus paper in the given set up is due to*

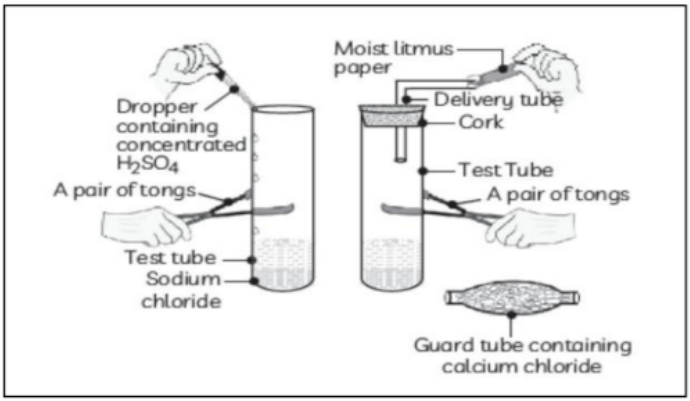
Figure: concentrated H_2SO_4 added from a dropper to sodium chloride in a test tube; the gas passes through a delivery tube to moist litmus paper; guard tube containing calcium chloride

i. presence of acid

ii. presence of base

iii. presence of $H^+(aq)$ in the solution

iv. presence of Litmus which acts as an indicator



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

55) *Anita added a drop each of diluted acetic acid and diluted hydrochloric acid on pH paper and compared the colors. Which of the following is the correct conclusion?*

(a) pH of acetic acid is more than that of hydrochloric acid

(b) pH of acetic acid is less than that of hydrochloric acid

(c) Acetic acid dissociates completely in aqueous solution

(d) Acetic acid is a strong acid

Assertion and Reason

1) *Assertion (A): Onion extract loses its smell, when it is added to baking soda solution whereas it retains its smell when added to lemon juice.*
Reason (R): Onion acts as an olfactory indicator.

2) *Assertion (A): Concentrated nitric acid is diluted by adding water slowly to acid with constant stirring.*
Reason (R): Concentrated nitric acid is easily soluble in water.

3) *Assertion (A): On adding dil. HCl to a test tube containing a substance 'X', a colourless gas is produced which gives a pop sound when a burning match stick is brought near it.*
Reason (R): In this reaction metal 'X' is displaced by Hydrogen.

4) *Assertion (A): It is advised that while diluting an acid one should add water to acid and not acid to water keeping the solution continuously stirred.*
Reason (R): The process of dissolving an acid into water is highly exothermic.