St.JOHN'S RESIDENTIAL PUBLIC SCHOOL

AFFILIATED TO C.B.S.E

SONAGOPALPUR, SAMPATCHAK, PATNA.7

ASSIGNMENT ....CHEMISTRY (2)

STD...XTH ***PREPARED BY .....S.K.VERMA***

ACID BASE SALT

Question 1
What colour do the following indicators turn when added to a base or alkali (such as sodium hydroxide)?
(a) Methyl orange (b) litmus (c) red cabbage extract

Question 2
What colours do the following indicators turn when added to an acid (such as hydrochloric acid)
(a) litmus (b) methyl orange

Question 3
Name an indicator which is red in acid solution but turns blue in basic solution.

Question 4
Name an indicator which is pink in alkaline solution but turns colourless in acidic solution.

Question 5
When a solution is added to a cloth strip treated with onion extract, then the smell of onion cannot be detected. State whether the given solution contains an acid or base.

Question 6

When a solution is added to vanilla extract, then the characteristic smell of vanilla cannot be detected. State whether the given solution is an acid or a base.

Question 7

How will you test for the gas which is liberated when hydrochloric acid reacts with an active metal?

Question 8

Name the gas evolved when dilute HCl reacts with sodium hydrogen-carbonate. How is it recognized?

Question 9

Give the formulae of two strong acids and two weak acids.

Question 10

Name on natural source of each of the following acids:
(a) Citric acid (b) Oxalic acid
(c) Lactic acid (d) Tartaric acid

Question 11

Name one animal and one plant whose stings contain formic acid (or methanoic acid)

Question 12

How is the concentration of hydronium ions (H_3O^+) affected when the solution of an acid is dilute?

Question 13

Write in equation form and balance the reactions when :
(a) dilute sulphuric acid reacts with zinc granules.
(b) dilute hydrochloric acid reacts with magnesium ribbon.

(c) dilute sulphuric acid reacts with ammonium powder.
(d) dilute hydrochloric acid reacts with iron filings.

Question 14

Complete and balance the following chemical equations:

(A) $Zn + HCl \longrightarrow ZnCl_2 + H_2$

(B) $Na_2CO_3 + HCl \longrightarrow NaCl + CO_2 + H_2O$

(C) $NaHCO_3 + HCl \longrightarrow NaCl + CO_2 + H_2O$

(D) $NaOH + HCl \longrightarrow NaCl + H_2O$

(E) $CuO + HCl \longrightarrow CuCl_2 + H_2O$

Question 15

Fill in the blanks in the following sentences :

(a) Acids have a _____ taste and they turn _____ litmus to _____.
(b) Substances do not show their acidic properties without _____.
(c) Acids produce _____ ions on dissolving in water.
(d) Those substances whose smell (or odour) changes in acidic or basic solutions are called _____ indicators.
(e) Onion and vanilla extract are _____ indicators.

Question 16

(a) What is an indicator? Name three common indicators.
(b) Name the acid-base indicator extracted from lichen.
(c) What colour does the turmeric paper turn when put in an alkaline solution?

Question 17

What is an olfactory indicator? Name two olfactory indicators. What is the effect of adding sodium hydroxide solution to these olfactory indicators?

Question 18

(a)What happens when an acid reacts with a metal? Give chemical equation of the reaction involved.
(b) Which gas is usually liberated when an acid reacts with a metal? How will you test for the presence of this gas?

Question 19

While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?

Question 20

What happens when an acid reacts with a metal hydrogen carbonate? Write equation of the reaction which takes place.

Question 21

(a)What happens when dilute hydrochloric acid is added to sodium carbonate? Write balanced equation of the reaction involved.
(b)Which gas is liberated when dilute hydrochloric acid reacts with sodium carbonate? How will you test for the presence of this gas?

Question 22

What happens when an acid reacts with a base? Explain by taking the example of hydrochloric acid and sodium hydroxide. Give equation of the chemical equation which takes place. What is the chemical name of such a reaction?

Question 23

What happens when an acid reacts with a metal oxide? Explain with the help of an example. Write a balanced equation for the reaction involved.

Question 24

(a) What are organic acids and mineral acids?
(b) Give two examples each of organic acids and mineral acids.
(c) State some of the uses of mineral acids in industry.

Question 25

What is meant by strong acids and weak acids? Classify the following into strong acids and weak acids:
HCl, CH_3COOH, H_2SO_4, HNO_3, H_2CO_3, H_2SO_3

Question 26

Why do HCl, H_2SO_4, HNO_3 ,etc., show acidic character in aqueous solutions while solutions of compounds like $C_6H_{12}O_6$ (glucose) and C_2H_5OH (alcohol) do not show acidic character?

Question 27

What is a neutralisation reaction? Explain with an example. Give the chemical equation of the reaction which takes place.

Question 28

Why should curd and other sour food stuffs (like lemon juice) not be kept in metal containers(such as copper and brass vessels) ?

Question 29

(a) What is produced if an acid is added to a base?
(b) Why does dry HCl gas not change the colour of dry litmus paper?
(c) What colour does phenolphthalein indicator turn when added to an alkali (such as sodium hydroxide)?

Question 30

(a)Why do acids not show acidic behaviour in the absence of water?
(b)Why does an aqueous solution of acid conduct electricity?
(c)Why does distilled water not conduct electricity whereas rain water does?

Question 31

(a) What happens when an acid reacts with a metal carbonate? Explain with the help of an example. Give chemical equation of the reaction involved.
(b) What happens when carbon dioxide gas is passed through lime water:
(i) for a short time?
(ii) for a considerable time?
Write equations of the reactions involved.

Question 32

With the help of labelled diagrams, describe an activity to show that acids produce ions only in aqueous solutions.

Question 33

(a) Which element is common to all acids?
(b) Compounds such as alcohol and glucose also contain hydrogen but are not categorized as acids. Describe an activity to prove it.

Question 34

When a piece of limestone reacts with dilute HCl, a gas X is produced. When gas X is passed through water, then a white precipitate Y is formed. On passing excess of gas X, the white precipitate dissolves forming a soluble compound Z.

(a) What are X, Y and Z?
(b) Write equations for the reactions which takes place:

(i) when limestone reacts with dilute HCl
(ii) when gas X reacts with limewater to form white precipitate Y.
(iii) when excess gas X dissolves white precipitate Y to form a soluble compound Z.

Question 35

If someone is suffering from the problem of acidity after overeating, which of the following would suggest as remedy? Lemon juice, Vinegar, Baking soda solution? Give reason for your choice.

Question 36

On adding dilute hydrochloric acid to copper oxide powder, the solution formed is blue-green in colour.
(a) Predict the new compound formed which imparts a blue-green colour to solution.
(b) Write a balanced chemical equation of the reaction which takes place.
(c) On the basis of the above reaction, what can you say about the nature of copper oxide?

Question 37

A white shirt has a yellow stain of curry. When soap is rubbed on this shirt during washing, the yellow stain turns reddish-brown. On rinsing the shirt with plenty of water, the reddish-brown stain turns yellow again.

(a) Name the natural indicator present in curry stain.
(b) Explain the change in colour of this indicator which takes place during washing and rinsing the shirt.
(c) What is the nature of soap(acidic/basic) as shown by the indicator present in the curry?

Question 38
You have been provided with three test-tubes. One of these test - tubes contain distilled water and the other two contain an acidic

and a basic solution respectively. If you are given only blue litmus paper, how will you identify the contents of each test-tube?

Question 39

A substance X which is used as an antacid reacts with dilute hydrochloric acid to produce a gas Y which is used in one type of fire-extinguisher. Name the substance X and gas Y. Write a balanced equation for the chemical reaction which takes place.

Question 40

How is neutralization of a carbonate with an acid different from the neutralization of an oxide or a hydroxide?

Question 41

What happens to (a) the H^+ ions, and (b) temperature of the solution, when an acid is neutralized?

Question 42

Name the gas evolved when zinc granules are treated with :
(a) Hydrochloric acid solution
(b) Sodium hydroxide solution

Question 43

What is the common name of water soluble bases?

Question 44

What is common in all the water soluble bases (or alkalis)?

Question 45

Why does tooth decay start when the pH of mouth is lower than 5.5?

Question 46

What is the pH of a neutral solution?

Question 47

Which is more acidic: a solution of pH = 2 or a solution of pH = 6?

Question 48

Which is more basic (or more alkaline): a solution of pH = 8 or a solution of pH = 11?

Question 49

Name the scientist who developed the pH scale.

Question 50

Name the indicator which can give us an idea of how strong or weak an acid or base is.

Question 51

The pH of soil A is 7.5 while that of soil B is 4.5. Which of the two soils, A or B, should be treated with powdered chalk to adjust its pH and why?

Question 52

What is the name of the indicator which can be used for testing the pH of a solution?

Question 53

What colour will universal indicator show if you add it to the following substances?

(a) Potassium hydroxide, pH = 12
(b) Soda water, pH = 5
(c) Sulphuric acid, pH = 2

Question 54

A beaker of concentrated hydrochloric acid has a pH of 1. What colour will full range universal indicator turn if it is added to this beaker? Is it a strong or a weak acid?

Question 55

Two solutions X and Y are tested with universal indicator. Solution X turns orange whereas solution Y turns red. Which of the solutions is a stronger acid?

Question 56

Two solutions A and B have pH values of 3.0 and 9.5 respectively. Which of these will turn litmus solution from blue to red and which will turn phenolphthalein from colourless to pink?

Question 57

Two drinks P and Q gave acidic and alkaline reactions, respectively. One has a pH value of 9 and the other has a pH value of 3. Which drink has the pH value of 9?

Question 58

Two solutions X and Y have pH = 4 and pH = 8, respectively. Which solution will give alkaline reaction and which one acidic?

Question 59

Fill in the blanks with suitable words:

(a) Acids have a pH _____ than 7.
(b) Alkalis have a pH _____ than 7.
(c) Neutral substances have a pH of _____.
(d) The more acidic a solution, the _____ the pH.
(e) The more alkaline a solution, the _____ the pH.

Question 60

Fresh milk has a pH of 6. When it changes into curd (yogurt), will its pH value increase or decrease? Why ?

Question 61

(a) What is a universal indicator? For what purpose is it used?

(b) How does a universal indicator work?
(c) Water is a neutral substance. What colour will you get when you add a few drops of universal indicator to a test-tube containing water?

Question 62

Which chemical is injected into the skin of a person:

(a) during an ant's sting?
(b) during the nettle leaf hair sting?

How can the effect of these stings be neutralized?

Question 63

(a) Explain the pH change as the cause of tooth decay. How can tooth decay caused by pH change be prevented?
(b) Explain how pH change in the lake water can endanger the lives of aquatic animals (like fish). What can be done to reduce the danger to the lives of aquatic animals in the lake?

Question 64

(a) What happens during a bee sting? What is its remedy?
(b) What happens during a wasp sting? What is its remedy?

Question 65

(a) Why is it wrong to treat a bee sting with vinegar?
(b) Why is it wrong to treat a wasp sting with baking soda solution?

Question 66

(a) What does the pH of a solution signify? Three solutions A, B and C have pH values of 6, 4 and 10 respectively. Which of the solutions is highly acidic?
(b) A farmer has found that the pH of soil in his fields is 4.2. Name any two chemical materials which he can mix with the soil to adjust its pH.

Question 67

(a) The pH values of six solutions A to F are given below:

A = 0; B = 11, C = 6, D = 3, E = 13, F = 8

Which of the above solutions are (i) acids (it) alkalis?
(b) Name the acids or alkalis used to make (i) car batteries (ii) explosives (iii) soaps (iv) fertilizers.

Question 68

(a) The pH of a cold drink is 5. What will be its action on blue and red litmus solutions?
(b) The pH values of three acids A, B and C having equal molar concentrations are 5.0, 2.8 and 3.5 respectively. Arrange these acids in order of the increasing acid strengths.

Question 69

Under what soil conditions do you think a farmer would treat the soil of his fields with quicklime (calcium oxide), or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?

Question 70

Which acid is produced in our stomach ? What happens if there is an excess of acid in the stomach? How can its effect be cured?

Question 71

The soil in a field is highly acidic. Name two materials which can be added to this soil to reduce its acidity. Give the reason for your choice.

Question 72

What is meant by strong bases and weak bases? Classify the following into strong bases and weak bases:

$NaOH$,KOH ,NH_4OH , $Ca(OH)_2$, $Mg(OH)_2$

Question 73

What ions are present in the solutions of following substances? (write the symbols only)
(i) Hydrochloric acid (ii) Nitric acid

(iii) Sulphuric acid (iv) Sodium hydroxide
(v) Potassium hydroxide (vi) Magnesium hydroxide

Question 74

(a) What would you expect the pH of pure water to be?
(b) What colour would the universal indicator show in an aqueous solution of sugar? Why?
c) A sample of rain water turned universal indicator paper yellow. What would you expect its pH to be? Is it a strong or a weak acid?

Question 75

(a) What do you think will be the pH in the stomach of a person suffering from indigestion: less than 7 or more than 7?
(b) What do you think will be the pH of an antacid solution: less than 7 or more than 7?
(c) How does an antacid work?
(d) Name two common antacids.

Question 76

Separate the following into substances having pH values above and below 7. How do these influence litmus paper?

(i) Lemon juice (ii) Solution of washing soda (iii) Toothpaste
(iv) Vinegar (v) Stomach juices

Question 77

(a) Do basic solutions also have H^+ (aq) ions? If yes, then why are they basic?
(b) When a solution becomes more acidic, does the pH get higher or lower?

Question 78

(a) Define an acid and a base. Give two examples of each.
(b) Give the names and formulae of two strong bases and two weak bases.
(c) What type of ions are formed:
(i) when an acid is dissolved in water?

(ii) when a base (or alkali) is dissolved in water?
(d) Write the neutralization reaction between acids and bases in terms of the ions involved.
(e) Write any two important uses of bases

Question 79

(a) What happens when zinc granules are heated with sodium hydroxide solution? Write equation of the reaction which takes place.

(b) What happens when bases react with non-metal oxides? Explain with the help of an example. What does this reaction tell us about the nature of non-metal oxides?

Question 80

(a) What effect does the concentration of H^+ (aq) ions have on the nature of a solution?
(b) What effect does the concentration of OH^- ions have on the nature of a solution?
(c) Someone put some universal indicator paper into vinegar. The pH is 3. What does this tell you about the vinegar?
(d) Someone put some universal indicator paper onto wet soap. The pH is 8. What does this tell you about the soap?
(e) State whether a solution is acidic, alkaline or neutral if its pH is :
(i) 9 (ii) 4 (iii) 7 (iv) 1 (v) 10 (vi) 3

Question 81

A milkman adds a very small amount of baking soda to fresh milk.
(a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?
(b) Why does this milk take a long time to set as curd?

Question 82

Which of the following elements would form oxides which would indicate pH values less than 7, using moist pH paper?
Magnesium, Carbon, Sulphur, Hydrogen, copper

Question 83

The pH values of five solutions A, B, C, D and E are given below:

A=11, B = 7 , C = 1 , D = 13 , E = 5
Which solution is (i) weakly alkaline (ii) neutral (iii) strongly acidic (iv) strongly alkaline, and (v) weakly acidic ?

Question 84

Potatoes grow well on GOPU's farm which has soil with a pH of 5.5. GOPU decides to add lot of lime to soil so that he can grow broccoli in the same farm:
(a) Do potatoes grow better in acidic or alkaline soil?
(b) Does broccoli grow better in acidic or alkaline soil?

Question 85

A first-aid manual suggests that vinegar should be used to treat wasp stings and baking soda for bee stings.
What does this information tell you about the chemical nature of:
(a) wasp stings ?
(b) bee stings?

Question 86

(a) Explain why the pH in a person's mouth becomes lower after each meal.
(b) What damage could be caused while the pH is low?
(c) How could the person change his eating habits to reduce the chances of suffering from tooth decay?

Question 87

What is the chemical formula of
(a) baking soda, and
(b) washing soda

Question 88

Write the chemical formula of (i) soda ash and (ii) sodium carbonate decahydrate.

Question 89

State whether the following statement is true or false:

Copper sulphate crystals are always wet due to the presence of water of crystallization in them.

Question 90

Which of the following salt has a blue colour and why?
$CuSO_4.5H_2O$ or $CuSO_4$

Question 91

What would be the colour of litmus in a solution of sodium carbonate?

Question 92

State the common and chemical names of the compounds formed when plaster of Paris is mixed with water.

Question 93

With which substance should chlorine be treated to get bleaching powder?

Question 94

What is the chemical name of calcium sulphate hemihydrate?

Question 95

Name the product formed when Cl_2 and H_2 produced during the electrolysis of brine are made to combine.

Question 96

Name a calcium compound which hardens on wetting with water.

Question 97

Name a sodium compound which is a constituent of many dry soap powders.

Question 98

Name a metal carbonate which is soluble in water.

Question 99

Name an acid which is present in baking powder.

Question 100

Name the metal whose carbonate is known as washing soda.

Question 101

Which compound is used as an antacid in medicine: $NaHCO_3$ or Na_2CO_3?

Question 102

What is the common name of (a)$NaHCO_3$ and (b) $Na_2CO_3.10H_2O$

Question 103

Write the chemical name and formula of (a) common salt and (b) caustic soda.

Question 104

What are the two main ways in which common salt(sodium chloride) occurs in nature?

Question 105

Name the major salt present in sea water.

Question 106

How is common salt obtained from sea water?

Question 107

Why is sodium chloride required in our body?

Question 108

Name three chemicals made from common salt (or sodium chloride.

Question 109

Give any two uses of common salt (sodium chloride).

Question 110

What name is given to the common salt which is mined from underground deposits? How was this salt mined?

Question 111

Name the salt which is used as preservative in pickles, and in curing meat and fish.

Question 112

Name the raw material used for production of caustic soda.

Question 113

The electrolysis of an aqueous solution of sodium chloride gives us three products. Name them.

Question 114

During electrolysis of a saturated solution of sodium chloride, where is :
(a) chlorine formed?

(b) hydrogen formed?
(c) sodium hydroxide fromed?

Question 115

Complete and balance the following equations :

(a) $NaCl\ (aq) + H_2O\ (l) \xrightarrow{\text{Electricity}}$

(b) $2NaHCO_3 \xrightarrow{\text{Heat}}$

(c) $NaCl + NH_3 + H_2O + CO_2 \rightarrow$

(d) $Ca(OH)_2 + Cl_2 \rightarrow$

Question 116

What is washing soda? State two properties and two uses of washing soda.

Question 117

What is baking soda? Write the chemical name of baking soda. Give the important uses of baking soda. How does baking soda differ chemically from washing soda?

Question 118

(a) What is meant by "water of crystallisation" in a substance? Explain with an example.
(b) How would you show that blue copper sulphate crystals contain water of crystallization?

Question 119

(a) What is the common name of sodium hydrogencarbonate?
(b) What happens when a solution of sodium hydrogencarbonate is heated? Write the equation of the reaction involved.
(c) Explain why, sodium hydrogencarbonate is used as an antacid.

Question 120

(a) What will happen if heating is not controlled while preparing Plaster of Paris?
(b) Write an equation to show the reaction between plaster of Paris and water.

Question 121

(a) What happens when copper sulphate crystals are heated strongly? Explain with the help of an example.
(b) What happens when a few drops of water are added to anhydrous copper sulphate? Explain with the help of an equation.

Question 122

(a) Name two constituents of baking powder.
(b) How does baking powder differ from baking soda?
(c) Explain the action of baking powder in the making of cake (or bread). Write equation of the reaction involved.

Question 123

(a) What is the chemical name of bleaching powder?
(b) What is the chemical formula of bleaching powder?
(c) What are the materials used for the preparation of bleaching powder?
(d) State one use of bleaching powder (other than bleaching).

Question 124

What does a soda-acid type fire extinguisher contain? How does it work? Explain the working of acid fire extinguisher with the help of labelled diagram.

Question 125

(a) Name a sodium compound used for softening hard water.
(b) Which compound of calcium is used for disinfecting drinking water supply?

(c) Name a metal compound which has detergent properties (cleansing properties).
(d) State a peculiar (or remarkable) property of plaster of Paris.
(e) Name the substance obtained by the action of chlorine on solid (dry) slaked lime.

Question 126

(a) What is "baking powder"? How does it make the cake soft and spongy?
(b) In addition to sodium hydrogencarbonate, baking powder contain a substance X. Name the substance. What is the role of substance X in the baking powder?

Question 127

State two uses each of the following compounds :
(a) Sodium hydroxide (b) Chlorine
(c) Hydrogen (d) Hydrochloric acid.

Question 128

(a) Which property of plaster of Paris is utilised in making casts for broken limbs in hospitals?

Question 129

(a) What happens when a concentrated solution of sodium chloride (brine) is electrolyzed? Write the equation of the reaction involved.
(b) Why is the electrolysis of a concentrated solution of sodium chloride known as chlor-alkali process?
(c) Name three products of the chlor-alkali process. State two uses of each of these products.

Question 130

(a) Describe how washing soda is produced starting from sodium chloride (common salt). Write equations of all the reactions involved.

(b) Mention two important uses of washing soda (or sodium carbonate).

Question 131

(a) Explain why plaster of Paris should be stored in a moisture-proof container.
(d) Write two important uses of plaster of Paris.

Question 132

Consider the following substances :

NaCl , $Ca(OH)_2$, $NaHCO_3$, NH_3, Na_2CO_3, H_2O, Cl_2, CO_2, $CaSO_4.2H_2O$, $2CaSO_4.H_2O$, $CaOCl_2$

(a) Which two substances combine to form bleaching powder?
(b) Which four substances are utilised in the production of washing soda?
(c) Which compound represents plaster of Paris?
(d) Which compound is a part of baking powder?
(e) Which compound is used as an antacid?

Question 133

A compound X which is prepared from gypsum has the property of hardening when mixed with a proper quantity of water.
(a) Identify the compound X
(b) Write the chemical equation for its preparation.
(c) For what purpose is it used in hospitals?

Question 134

Consider the following salts :

Na_2CO_3, NaCl, NH_4Cl, CH_3COONa, K_2SO_4, $(NH_4)_2SO_4$

Which of these salts will give :

(a) acidic solutions?

(b) neutral solutions?
(c) basic solutions (or alkaline solutions)?

Question 135

A white powdery substance having strong smell of chlorine is used for disinfecting drinking water supply at waterworks. Identify the substance. Give its chemical name .

Question 136

A person found that the cake prepared by him is hard and small in size. Which ingredient has he found to add that would have caused the cake to rise and become light? Explain your answer.

Question 137

Write the name and formula of one salt each which contains:

(a) two molecules of water of crystallisation
(b) five molecules of water of crystallisation
(c) ten molecules of water of crystallisation.

Question 138

How many molecules of water of crystallisation (per formula unit) are present in :

(a) copper sulphate crystals ?
(b) washing soda?
(c) gypsum ?