SCIENCE
WORKSHEET_230425
CHAPTER 02 ACIDS, BASES AND SALTS

SUBJECT: SCIENCE **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

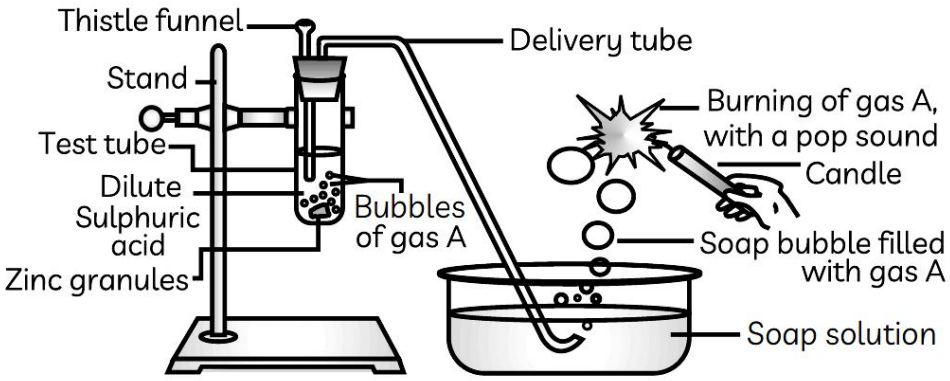
(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

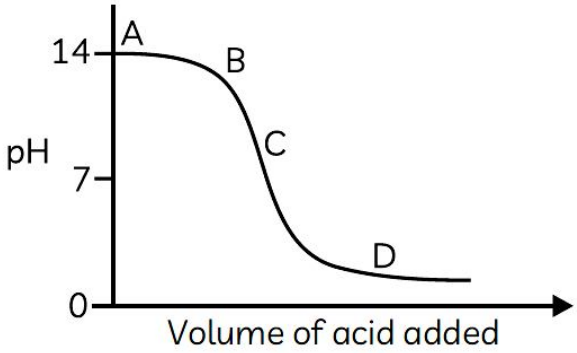
Questions 1 to 10 carry 1 mark each.

1. Identify gas A in the following experiment.



(a) Nitrogen (b) Hydrogen (c) Oxygen (d) Carbon dioxide

2. The graph given below depicts a neutralization reaction (acid + alkali → salt + water). The pH of a solution changes as we add excess of acid to an alkali.



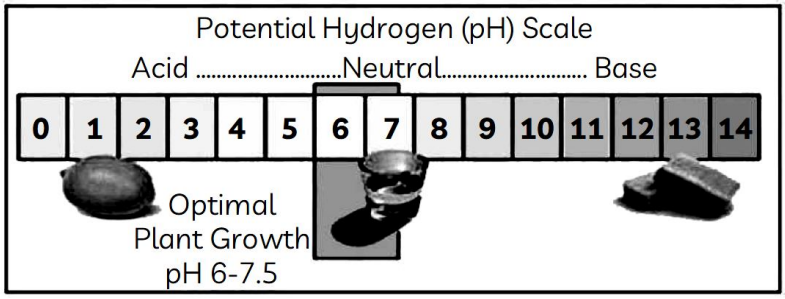
Which letter denotes the area of the graph where both acid and salt are present?

(a) A (b) B (c) C (d) D

3. When we smile, our teeth become visible. So, we should ensure that we have a beautiful set of teeth as it makes our smile even more beautiful. Tooth enamel is the thin outer covering of the tooth. This tough shell is the hardest tissue in the human body. Enamel covers the crown which is a part of tooth that's visible outside of the gums.

What is the nature of the salt present in the tooth enamel?
(a) Basic (b) Acidic (c) Neutral (d) Amphoteric.

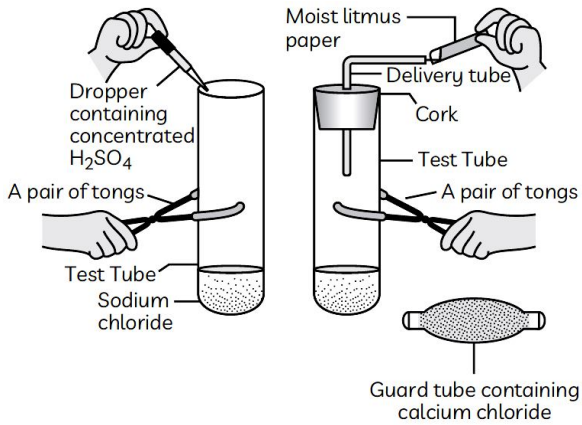
4. The sample of soil from a particular place was tested for its pH value. It came out to be 5.



Which one of the following should be added to the soil to make it suitable for plant growth?
(I) Calcium chloride (II) Calcium Hydroxide (III) Calcium sulphate (IV) Calcium oxide
Options:
(a) Both (I) and (II) (b) Both (II) and (IV)
(c) Both (II) and (III) (d) Only (III)

5. A solution of a base with pH 12.1 is given. Which of the following can be done to decrease its pH?
(I) Add distilled water to it.
(II) Add a solution of a different base with pH 8.7.
(III) Add few drops of an acid with an unknown pH.
(a) Only (I) (b) Only (III)
(c) Only (I) and (II) (d) Any of (I), (II) and (III)

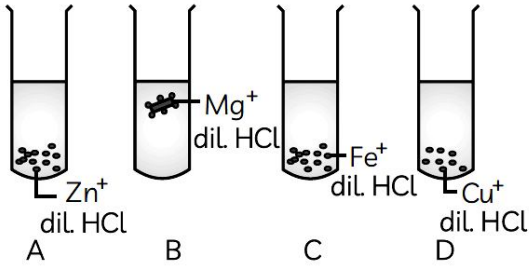
6. The change in colour of the moist litmus paper in the given set up is due to:



(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
Options:
(a) (I) and (II) (b) Only (II) (c) Only (III) (d) Only (IV)

7. Which of the following is/are true when HCl(g) is passed through water?
(I) It does not ionize in the solution as it is a covalent compound.
(II) It ionizes in the solution.
(III) It gives both hydrogen and hydroxyl ions in the solution.
(IV) It forms hydronium ion in the solution due to the combination of hydrogen ion with water molecule.
Select the correct option:
(a) Only (I) (b) Only (III) (c) (II) and (IV) (d) (III) and (IV)

8. The diagram shows the reaction between metal and dil. acid.



What is the reason for different behaviour of Mg in test tube B?
(a) Mg is lighter element than dil. HCl.
(b) Mg reacts with dil. HCl to produce H_2 gas which helps in floating.
(c) Mg reacts with dil. HCl to produce N_2 gas which helps in floating.
(d) Mg reacts with dil. HCl to produce CO_2 gas which helps in floating.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. **Assertion (A):** Sodium hydrogencarbonate is used as an ingredient in antacids.
Reason (R): $NaHCO_3$ is a mild noncorrosive basic salt.

10. **Assertion (A):** HCl gas does not change the colour of dry blue litmus paper.
Reason (R): Acids always produce hydrogen ions.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Identify the acid and the base from which sodium chloride is obtained. Which type of salt is it? When is it called rock salt? How is rock salt formed?

12. Write balanced chemical equation for the reaction that occurs when:
(a) Blue coloured copper sulphate crystals are heated and
(b) Sodium hydrogen carbonate is heated during cooking.

13. On adding a few drops of universal indicator in three colourless solutions X, Y and Z taken separately in three test tubes, a student observed the changes in colour as green in X, red in Y and blue in Z.
(a) Arrange X, Y and Z in increasing order of their pH values.
(b) Which one of the three, X, Y and Z, will change the colour of phenolphthalein? Why?

14. Out of HCl and CH_3COOH, which one is a weak acid and why? Explain with the help of an example.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) Write the name given to bases that are highly soluble in water. Give an example.
(b) How is tooth decay related to pH ? How can it be prevented?
(c) Why does bee sting cause pain and irritation ? Rubbing of baking soda on the sting area gives relief. How?

16. "Sodium hydrogencarbonate is a basic salt". Justify the statement. How is it converted into washing soda ? Explain.

17. Name the products formed in each case when
(a) hydrochloric acid reacts with caustic soda.
(b) granulated zinc reacts with caustic soda.
(c) carbon dioxide is passed into lime water.

SECTION – D

Questions 18 carry 5 marks.

18. State reason for the following statements:
(a) Tap water conducts electricity whereas distilled water does not.
(b) Dry hydrogen chloride gas does not turn blue litmus red whereas dilute hydrochloric acid does.
(c) During summer season, a milk man usually adds a very small amount of baking soda to fresh milk.
(d) For a dilution of acid, acid is added into water and not water into acid.
(e) Ammonia is a base but does not contain hydroxyl group.

OR

(a) Explain why is hydrochloric acid a strong acid and acetic acid, a weak acid. How can it be verified?
(b) Explain why aqueous solution of an acid conducts electricity.
(c) You have four solutions A, B, C and D. The pH of solution A is 6, B is 9, C is 12 and D is 7,
(i) Identify the most acidic and most basic solutions.
(ii) Arrange the above four solutions in the increasing order of H+ ion concentration.
(iii) State the change in colour of pH paper on dipping in solution C and D.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Read the given passage and answer the questions based on passage and related studied concepts.

The teacher was conducting practicals in laboratory divided the students in three groups and gave them various solutions to find their pH and classify them into acidic, basic and neutral solutions.
Group A: Lemon juice, vinegar, colourless aerated drink.
Group B: Tomato juice, coffee, ginger juice.
Group C: Sodium hydroxide, sodium chloride lime water.

(a) For the solution provided, which group is/are likely to have pH value (i) < 7 (ii) > 7.
(b) List two ways of determining pH of a solution.
(c) Explain, why the sour substances such as lemon juice are effective in cleaning the tarnished copper vessels.

OR

(c) "pH has great importance in our daily life." Justify this statement giving two examples.

20. Crystalline salts have water of crystallisation. The number of water molecules associated with crystals depends upon size of cation. The colour and physical state may be different for crystalline and amorphous salt. Crystalline salts have well defined geometrical shape, sharp melting point. Amorphous compounds do not have well defined shape.

(a) What is colour of hydrated copper sulphate?
(b) What is formula of washing soda?
(c) What happens when hydrated copper sulphate is heated? Write chemical equation.

OR

(c) What happens when water is added to anhydrous copper sulphate? Write chemical equation involved.