

NCERT QUESTIONS WITH SOLUTIONS

1. A solution turns the red litmus paper to blue. Excess addition of which of the following solution would reverse the change?

- (1) Lime water
- (2) Baking soda
- (3) Vinegar
- (4) Common salt solution

Ans. Option (3)

A solution that turns red litmus paper blue is basic in nature. Vinegar is an acidic substance. Adding an acid to a basic solution will neutralize it. Adding excess acid would then make the solution acidic again, causing it to turn blue litmus paper red. Lime water and baking soda are also basic and common salt solution is neutral, so they would not reverse the change.

2. You are provided with three unknown solutions labelled A, B, and C, but you do not know which of these are acidic, basic, or neutral. Upon adding a few drops of red litmus solution to solution A, it turns blue. When a few drops of turmeric solution are added to solution B, it turns red. Finally, after adding a few drops of red rose extract to solution C, it turns green.

Based on the observations, which of the following is the correct sequence for the nature of solutions A, B, and C?

- (1) Acidic, acidic, and acidic
- (2) Neutral, basic, and basic
- (3) Basic, basic, and acidic
- (4) Basic, basic, and basic

Ans. Option (4)

Solution A: A substance that turns red litmus paper blue is basic in nature.

Solution B: Turmeric paper turns red in basic solutions. It does not change colour in acidic or neutral solutions.

Solution C: Red rose extract turns green in a basic solution.

3. Observe and analyse figure. in which red rose extract paper strips are used. Label the nature of solutions present in each of the containers.



Ans. Red rose extract turns green in a basic solution.

Red rose extract remains unchanged (unspecified colour, but likely the original colour of the extract) in a neutral solution.

The red rose extract turns red in an acidic solution

4. A liquid sample from the laboratory was tested using various indicators: Indicator: Red litmus, Blue litmus, Turmeric. Change: No change, Turned red, No change in colour.

Indicator	Red litmus	Blue litmus	Turmeric
Change	No change	Turned red	No change in colour

Based on the tests, identify the acidic or basic nature of the liquid and justify your answer.

Ans. The liquid is acidic.

The liquid did not change the colour of red litmus paper, which is a characteristic of acidic or neutral substances.

The liquid turned blue litmus paper red, which indicates that the substance is acidic.

The liquid did not change the colour of turmeric paper, which means it is either acidic or neutral, since turmeric only turns red in basic solutions. All three tests confirms that the liquid sample is acidic.

5. Manya is blindfolded. She is given two unknown solutions to test and determine whether they are acidic or basic. Which indicator should Manya use to test the solutions and why?

Ans. Manya should use an olfactory indicator as olfactory indicators are substances whose odour or smell changes in acidic or basic solutions, allowing them to be used to distinguish between acids and bases. Since Manya is blindfolded, she cannot see colour of the visual indicator but she can use her sense of smell to detect the change in odour, such as the smell of onion, vanilla extract, or clove oil, to determine the nature of the solutions without seeing them.

6. Could you suggest various materials which can be used for writing the message on the white sheet of paper (given at the beginning of the chapter) and what could be in the spray bottle? Make a table of various possible combinations and the colour of the writing obtained.

Ans. The message must be written with a substance that acts as an indicator, and the spray bottle should contain a substance that is acidic or basic to cause a colour change.

Possible combinations are

Combination 1:

Writing material: Soap solution (basic)

Spray liquid: Turmeric solution (indicator)

Colour of written message: Red

Combination 2:

Writing material: Lemon juice (acidic)

Spray liquid: Red rose extract (indicator)

Colour of written message : Red

Combination 3:

Writing material: vinegar (acidic)

Spray liquid: Red rose extract indicator)

Colour of written message : Red

7. Grape juice was mixed with red rose extract; the mixture got a tint of red colour. What will happen if baking soda is added to this mixture? Justify your answer.

Ans. The mixture of grape juice with red rose extract got a tint of red colour suggests that grape juice is acidic in nature as the red rose extract turns red in an acidic solution. Baking soda is a basic substance when it is added to the acidic mixture, a neutralization reaction will occur and the solution will eventually become basic, and the red rose extract will then turn green.

8. Keerthi wrote a secret message to her grandmother on her birthday using orange juice. Can you assist her grandmother in revealing the message? Which indicator would you use to make it visible?

Ans. The grandmother can reveal the message by using a **red rose extract solution** as an indicator. As Orange juice contains citric acid.

If the message is written on white paper, the paper can be sprayed with a red rose extract solution. The orange juice which is acidic, would change the colour of the extract to red, making the message visible.

9. How can natural indicators be prepared? Explain by giving an example.

Ans. Natural indicators can be prepared by extracting the colour from certain plants or flowers.

For example: To prepare a red rose extract, collect some fallen red rose petals and wash them. Place them in a glass tumbler and add hot water to completely immerse the petals.

Cover the tumbler and wait for 5-10 minutes till the water becomes coloured. Now filter the liquid to get the red rose extract, which can be used as an acid-base indicator. Other examples of natural indicators include lichens, turmeric, beetroot, purple cabbage, Indian blackberry (jamun), and red hibiscus.

10. Three liquids are given to you. One is vinegar, another is a baking soda solution, and the third is a sugar solution. Can you identify them only using turmeric paper? Explain.

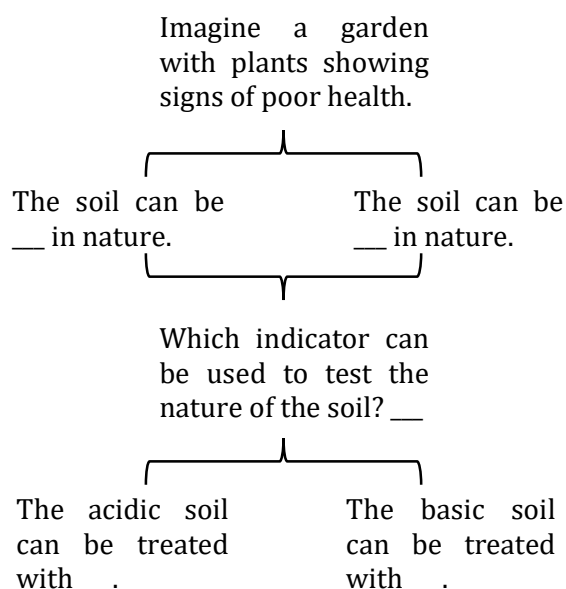
Ans. Yes, we can identify the nature of these liquids. Baking soda solution is a basic in nature, so it would turn the turmeric paper red as Turmeric paper changes its colour from yellow to red in the presence of a basic solution. Then take the same paper and cut it into two pieces and dip in the remaining two solutions. The solution in which it turns yellow is acidic (vinegar) as turmeric paper turns yellow in the acidic medium. In the other solution the paper remains red, hence it is (sugar solution) neutral.

11. The extract of red rose turns the liquid X to green. What will the nature of liquid X be? What will happen when excess of amla juice is added to liquid X?

Ans. Nature of Liquid X is basic in nature because the red rose extract turns green in a basic solution.

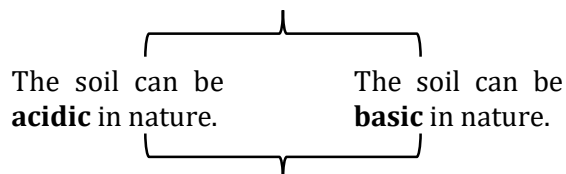
When excess of amla juice is added to a basic solution (Liquid X) will cause a neutralization reactions as more amla juice is added, the solution will become acidic, and the red rose extract will then turn red.

12. Observe and analyse the information given in the following flowchart. Complete the missing information.



Ans.

Imagine a garden with plants showing signs of poor health.



Which indicator can be used to test the nature of the soil? **Red rose extract**

