

NAME:

CLASS:

## pH MEASUREMENT & ITS APPLICATIONS

### Course Learning Outcome:

Demonstrate the correct techniques in handling laboratory apparatus and chemicals when carrying out experiments. (P3, PLO 2, MQF LOD 2)

### Learning Outcomes:

At the end of this lesson, students should be able to:

- i. prepare natural pH indicators from plants;
- ii. determine the pH of household products using the natural pH indicator; and
- iii. perform an acid-base reaction using household products.

### Student-Learning Time:

Face-to-face	Non face-to-face
1 hour	1 hour

**Direction:** Read over the lab manual and then answer the following question.

**Introduction: Drag and Drop the answers below into the suitable sentences.**

negative	OH <sup>-</sup> ions	pH	pH meter
non-ionised	weak	Anthocyanin	ionised
	pH paper	H <sup>+</sup> ions	

1. What is an acid and base?

Acid is a substance that ionizes in aqueous solution to produce

Base is a substance that ionizes in aqueous solution to produce

2. What is an indicator?

An indicator is a \_\_\_\_\_ organic acid or base that has distinctly different colours in its \_\_\_\_\_ and

\_\_\_\_\_ forms @ a substance which undergoes a change in colour when added to the acidic or basic solutions.

3. Define pH

\_\_\_\_\_ is a measure of acidity or basicity of a solution, and defined as \_\_\_\_\_ logarithm of hydrogen ion concentration, [H<sup>+</sup>].

4. Give two methods to determine pH in the laboratory.

- i. \_\_\_\_\_ and universal indicator
- ii. \_\_\_\_\_

5. What is the substance present in red cabbage and butterfly pea flower which causes the colour change when pH changes?

\_\_\_\_\_

**Choose the suitable answer for the procedure below:-**

**Procedure**

1. Red cabbage and butterfly pea flower can be used as a natural pH indicator. What is the colour of the red cabbage and butterfly pea flower indicators?

Red cabbage- \_\_\_\_\_

Butterfly pea flower- \_\_\_\_\_ blue/deep blue or dark blue

2. State the colour of the red cabbage and butterfly pea flower indicators in different mediums as shown in the table below.

Medium	Colour of indicator	
	Red cabbage	Butterfly pea
Strong acid		
Strong base		
Neutral		

3. Suggest **TWO** other plants that can be used besides red cabbage and butterfly pea flower.

1) \_\_\_\_\_

2) \_\_\_\_\_

4. What is the chemical reaction that occurs between an acid and base?

\_\_\_\_\_