

NEW VISION COMPETENCE-BASED CURRICULUM PRE-TEST 1

Time allowed: 2½ hours.

INSTRUCTIONS:

- *This Paper consists of **two** sections **A** and **B**.*
- *Answer **all** questions in section **A** and only **four** questions from section **B**.*
- *Questions in section **B** carry equal marks.*

SECTION A (Attempt all questions).

1. The chemistry laboratory is a risky place and requires learners to take precaution while conducting experiments. Recently a student sustained an injury shown by the image below.



- (a) (i) Identify the nature of injury.
(ii) How can such an injury be handled?
(iii) Explain how such an injury can be avoided.
(iv) Design a poster or signage with precaution message to display on wall of the laboratory to avoid such injuries.
- (b) Why are the laboratory rules and regulations important?

SECTION B (Attempt only four questions)

2. A student working hard on the laboratory experiment that uses strong acid. Halfway through the laboratory, the student gets hungry and starts eating a bag of chips. When he finished, he started licking his fingers. Another student carefully pours unknown solution from a test tube into a beaker. His friend sneaks behind him in order to surprise him. The student accidentally drops a glass beaker on the floor and pieces of glass land on the sandaled feet and both left without cleaning.
- (a) Identify the safety rules being violated.
- (b) What possible risks in this scenario and how can you minimize the harm?

3. Tooth decay begins when bacteria in your mouth break down leftover food to acids. The acids corrode the tooth's surface (enamel). This can lead to a small hole in a tooth, called a cavity. If tooth decay is not treated, it can cause pain, infection, and even tooth loss. Regular brushing of teeth can prevent tooth decay.
- (a) What is an **acid**?
 - (b) How do acids corrode the teeth?
 - (c) Explain how brushing the teeth with toothpaste prevent tooth decay?
4. After boiling water for some time, the heating element of a water heater appeared as shown below.



- (a) What happened to the heating coil?
 - (b) How does the boiled water cause such an effect on the heating coil?
 - (c) Explain how such a problem can be overcome.
5. Rocks in Uganda are found in a number of places. Some rocks are very big and shaped in ways that are amazing. In many societies mystery surrounds the formation of such rocks. Communities believe that rocks are associated with special powers and often perform rituals on rocks.



- (a) What is a **rock**?
- (b) How are rocks formed?
- (c) Briefly describe how rocks are important to your community?
6. Sugar, sucrose and cane sugar are the same molecule. Cane sugar got from sugar canes is added to hot water as a sweetener. The sucrose chemical formula is $C_{12}H_{22}O_{11}$. In sugar molecular formula C represents carbon, H represents hydrogen and O represents oxygen. 12 atoms of carbon, 22 atoms of hydrogen and 11 atoms of oxygen combine to form one molecule of sucrose. It is recommended that 6 tea spoons or 24 grams of sugar for most adult women are required per day



Mr Mutaaya the head teacher of vision college takes tea twice a day with each time taking 500cm^3 . What is the concentration of sugar in tea?

PRE-TEST 2 SECTION B:

2. The trend in oxidizing ability of the halogens can be determined by reacting aqueous solutions of halogens with aqueous solutions of potassium halide salts.

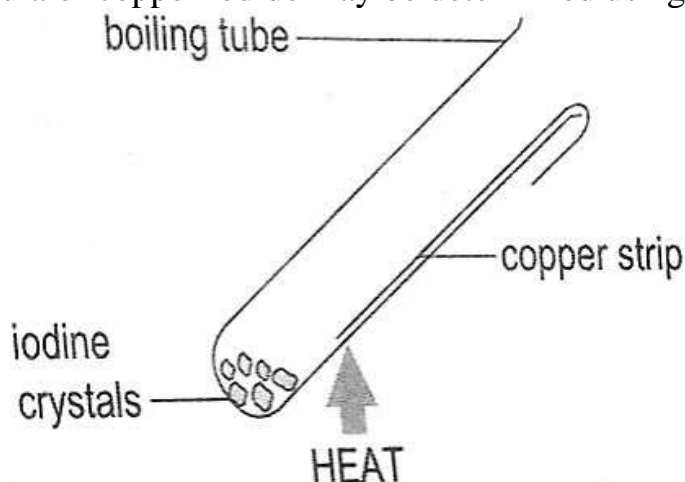
(a) Complete the table below.

Aqueous solution	Colour of aqueous solution
Chlorine	
Bromine	
Iodine	
Potassium halide	

- (b) A 1cm^3 portion of each aqueous halogen solution is added separately to 1cm^3 of potassium chloride solution in a test tube and any observations noted. The procedure is repeated using potassium bromide solution and also potassium iodide solution.
- (i) Complete the following table, using a tick (✓) to indicate that a reaction occurs and a cross(x) to indicate that no reaction occurs.

	Potassium chloride	Potassium bromide	Potassium iodide
Chlorine			✓
Bromine			
Iodine			

- (ii) Write an equation for the reaction of chlorine with potassium iodide.
- (iii) Some hexane was added to the test tube after the reaction of aqueous chlorine with potassium iodide solution was complete. The test tube was stoppered and shaken for one minute and contents were allowed to settle. What would be observed?
- (c) Chlorine reacts with water and with sodium hydroxide solution.
- (i) Write an equation for reaction of chlorine with water.
- (ii) State the conditions required for the reaction between chlorine and sodium hydroxide solution which yield products containing chlorine in the same oxidation states as those in c(i) above
- (iii) Suggest why ozone is often preferred to chlorine in water treatment.
3. The empirical formula of copper iodide may be determined using the apparatus below.



A small quantity of iodine crystals is added to the boiling tube. A clean copper strip is placed into the boiling tube and bent at one end so that it fits over the mouth of the boiling tube. The part of copper strip nearest the iodine crystals is heated gently in a fume cupboard until no more purple vapour is observed. Once the boiling tube cools, the copper strip is carefully removed and re-weighed. The yellow coating of copper iodide is scrapped from the surface of copper strip and the copper strip is re-weighed. The following results were obtained.

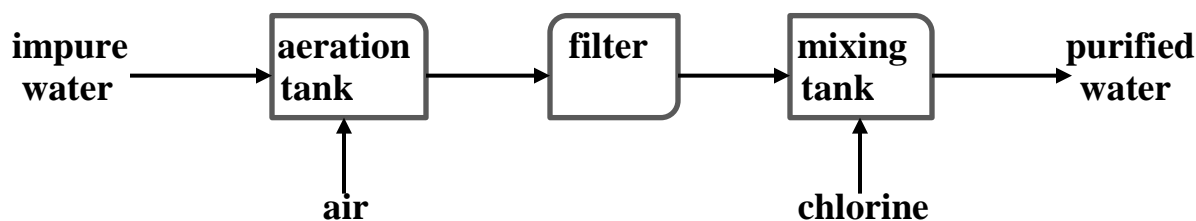
	Mass/g
Initial mass of copper strip	2.94
mass of copper strip and copper iodide	3.28
Final mass of copper strip	2.77

- (a) Explain why the iodine crystals are not heated directly.
- (b) Suggest why the procedure is carried out in a fume cupboard.
- (c) Calculate the mass of iodine that reacted.
- (d) Calculate the empirical formula of the copper iodide formed.

4. Water is a natural source.



- (a) Water in rivers often contains pollutants such as acids. Describe how universal indicator paper can be used to determine the pH value of the water.
- (b) The diagram below shows some of the stages of water treatment.



- (i) Air is blown through the aeration tank. Name two gases that make up most of the air.
- (ii) After aeration the water still contains large insoluble particles. The filter is made up of fine sand and stones. Explain how the filter helps purify the water.
- (iii) Explain why chlorine is used in water treatment.
- (iv) Anhydrous cobalt (II) chloride is used to test for water. State the colour change in this test.

END.