ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

COMBINED SCIENCE 4003/3

PAPER 3 (Practical Test)

NOVEMBER 2018 SESSION 1 hour 30 minutes

Candidates answer on the question paper

Additional materials:
As listed in instructions to Supervisors
Calculator (optional)

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **both** questions.

Write your answers in the spaces provided on the question paper.

Use a sharp pencil for your drawings. Coloured pencils or crayons should not be used.

You should record all experimental results and show the essential steps in any calculation in the spaces provided in the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S USE	
1	
2	
TOTAL	

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Answer all questions.

1. You are required to determine the pH of three liquids, A1, A2 and A3.
You are provided with the three liquids in test tubes labelled A1, A2 and A3, universal indicator solution, a universal indicator chart and a dropper.

(a) **(i)** Add 2 drops of universal indicator solution to each of the liquids A1, A2 and A3. Record the colour and pH of each of the liquids in **Table 1.1**.

Table 1.1

liquid	**colour after adding universal indicator solution**	**pH**	**acid-base nature of liquid**
A1			
A2			
A3			

[12]

(ii) State the colour of the universal indicator solution.

..... **[1]**

(b) Apart from using universal indicator solution or universal indicator paper, describe another way of determining the acid-base nature of liquids A1, A2 and A3, stating the expected results for each of the liquids.

A1.....
.....
A2.....
.....
A3.....
..... **[5]**

(c) **(i)** State any **one** precaution that should be taken during the experiment.

.....

..... **[1]**

(ii) State **one** possible source of error in the experiment.

.....

..... **[1]**

2. You are required to compare the densities of water and cooking oil.
You are provided with water and cooking oil, 2 beakers labelled **A** and **B**, a measuring cylinder and access to a balance.

Measure the mass of the empty beaker labelled **A** and record the mass in **Table 2.1** under the column labelled **for water**.

Measure 20.0 cm^3 of water and pour it into beaker **A.**
Record the mass of the water and the beaker in the table of results.
Calculate the mass of the water and record it in the table of results. Repeat the procedure using beaker **B** and cooking oil instead of water.

Table 2.1

mass of beaker + contents/g	**for water**	**for cooking oil**
mass of empty beaker/g		
mass of contents/g		

[12]

(b) **(i)** Calculate the density of the water.

..... **[2]**

(ii) Calculate the density of the cooking oil.

..... **[2]**

(c) Mix about 5 cm^3 of water and about 5 cm^3 of cooking oil in a test tube.
State, giving a reason, the liquid that oats.

.....
.....
.....**[2]**

(d) **(i)** State **one** source of error in the experiment.

..... **[1]**

(ii) Suggest **one** way of improving the experiment.

..... **[1]**