Candidate Name	Centre Number	Candidate Number
MATHS GUARDIOLA	+44 785 295 4215	

For Performance Measurement

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

COMBINED SCIENCE **4003/3**

PAPER 3 Practical Test 1 hour 30 minutes

JUNE 2024 SESSION

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.

Record all experimental results 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	

This question paper consists of 6 printed pages and 2 blank pages.

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1 You are required to determine the amount of the soluble solid in a mixture.

You are provided with a mixture of a soluble solid and an insoluble solid.

The mixture is labelled **S**.

You are also provided with a beaker labelled B1, a stirring rod, water, measuring cylinder, filter paper, a filter funnel, access to a balance.

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(a) Measure 20.0 cm^3 of water using a measuring cylinder.

Add the water to the beaker, B1.

Measure the mass of B1 plus the water.

Record the mass of B1 plus the water in **Table 1.1**.

Add the mixture S to the beaker **B1**.

Set up the filtration process apparatus as shown in **Fig.1.1**.

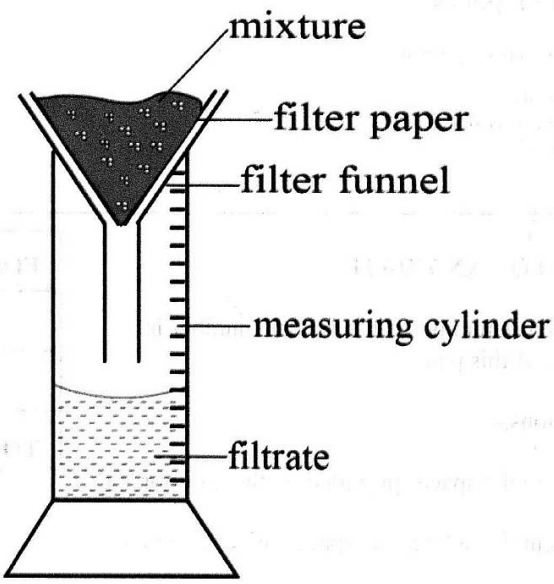


Fig.1.1

Thoroughly stir the contents of B1.

Pour the contents of B1 onto the filter paper.

Wait until the filtration process is complete.

Measure the volume of the filtrate using the measuring cylinder.

Record the volume of the filtrate in **Table 1.1**.

Rinse beaker B1.

Pour the filtrate into B1.

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Measure the mass of B1 plus the filtrate.

Record the mass of B1 plus the filtrate in **Table 1.1**.

Complete **Table 1.1**.

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Table 1.1

Mass of B1 + filtrate/g	
Mass of B1 + water/g	
Mass of soluble solid/g	
Volume of filtrate/cm^3	

[11]

(b) **(i)** Explain why stirring was done during the experiment.

_____

_____ [1]

(ii) Suggest **one** possible source of error during the filtration process.

_____

_____ [1]

(iii) Describe how the error suggested in **(ii)** would affect the results.

_____

_____ [1]

(c) **(i)** Calculate the concentration, in g/cm^3, of the filtrate collected.

[2]

(ii) State the assumption made when calculating the concentration.

_____

_____ [1]



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(d) Describe the process that could be carried out to obtain crystals of the soluble solid from the filtrate.

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_____

_____

_____

_____

_____

_____ [3]

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2 You are required to determine the effect of the nature of a surface on the force of friction.
You are provided with a force meter, brick, access to a wooden surface, access to a floor or tile surface and string.
Take the mass of the brick as 3 100 g.

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(a) (i) Set up the apparatus as shown in **Fig.2.1**.

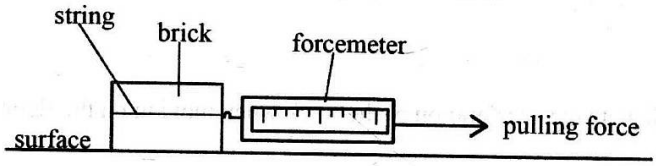


Fig.2.1

Place the brick on top of the table (wooden surface).
Pull the brick using a forcemeter until the brick just starts to move.
Read the force required to just move the brick.
Record the force in **Table 2.1**.
Place the brick on top of the floor.
Pull the brick using a forcemeter until the brick starts to move.
Read the force required to just move the brick.
Record the force in **Table 2.1**.

Table 2.1

surface	mass of brick/g	mass of brick/kg	force of friction/N
wooden surface	3 100		
floor surface	3 100		

[10]

(ii) Explain the relationship between the nature of surface and the force of friction.

_____

_____

_____

_____ [2]



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(b) **(i)** Calculate the acceleration of the brick when moving on the wooden surface.

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_____

_____

_____

_____ [2]

(ii) Calculate the acceleration of the brick when moving on the floor surface.

_____

_____

_____

_____ [2]

(c) **(i)** State a possible source of error in the experiment apart from parallax error.

_____

_____

_____

_____ [1]

(ii) Describe how the error stated in **(c)(i)** can be avoided.

_____

_____ [1]

(iii) State, giving a reason, **one** precaution which must be taken during the experiment.

_____

_____

_____ [2]

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