



education

Department of
Education
FREE STATE PROVINCE

GRADE 6

NATURAL SCIENCES AND TECHNOLOGY

JUNE 2023

TIME: 1½ HOURS

Gr6 NATURAL SCIENCE & TECHNOLOGY



06991B

MARKS: 50

This question paper consists of 9 pages.

Name and surname: _____

School: _____

Class : _____

X10



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INSTRUCTIONS AND INFORMATION:

1. The question paper has 9 pages consisting of 6 questions in 2 sections.
2. Allocation of marks:

SECTION A: 15 marks
SECTION B: 35 marks
3. Read all the questions carefully before you start writing.
4. Answer all questions in the spaces provided.
5. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Four options are provided as answers to the following questions. Each question has only ONE correct answer. CIRCLE only the LETTER next to the question number.

1.1.1 Which one of the following properties is TRUE for the arrangement of particles in a liquid?

- A. Particles are very far apart.
- B. Particles can move freely in all directions.
- C. Particles have a fixed pattern.
- D. Small space between particles (1)

1.1.2 When dissolving sugar in water, the water component is called the ...

- A. solute.
- B. solvent.
- C. solution.
- D. soluble. (1)

1.1.3 Sieving refers to ...

- A. separating a liquid and a substance by pouring it through a material like mesh.
- B. using a tool with holes that allow pieces of a certain size to pass through.
- C. allowing a substance mixed with a liquid to settle at the bottom.
- D. breaking up a mixture into the substance mixed. (1)

1.1.4 Sand and water is a mixture of a ...

- A. solid and liquid.
- B. solid and gas.
- C. solid and solid.
- D. a liquid and gas. (1)

1.1.5 Which one of the following statements is TRUE?

- A. Matter is made of tiny particles that can be seen with the eye.
- B. Particles of matter have spaces between them.
- C. Not all particles of matter vibrate or move.
- D. All of the above (1)

[5]

1.2 Match the statements in COLUMN A with the correct word in COLUMN B. Write the correct LETTER in COLUMN C next to the number, e.g. 1.2.5 G.

COLUMN A		COLUMN B		COLUMN C
1.2.1	It appears the same right through the mixture.	A	Insecticides	1.2.1
1.2.2	Adding special substances to unsafe water to kill germs.	B	Fertilizers	1.2.2
1.2.3	Chemicals used to make plants grow better.	C	Uniform	1.2.3
1.2.4	A mixture in which different substances cannot be identified.	D	Physical	1.2.4
1.2.5	To use hands or tools to separate a mixture	E	Solution	1.2.5
		F	Chemicals	

[5]

1.3 Give the correct scientific term for each of the following descriptions. Write the correct term next to the description.

DESCRIPTIONS		ANSWER
1.3.1	An area covered by a shallow water for most of the year.	_____
1.3.2	How well a substance will dissolve.	_____
1.3.3	When water contains germs that make it unsafe to drink.	_____
1.3.4	To break up a mixture into the substances mixed.	_____
1.3.5	Changing from a liquid to a gas.	_____

[5]

TOTAL SECTION A: 15

SECTION B

QUESTION 2

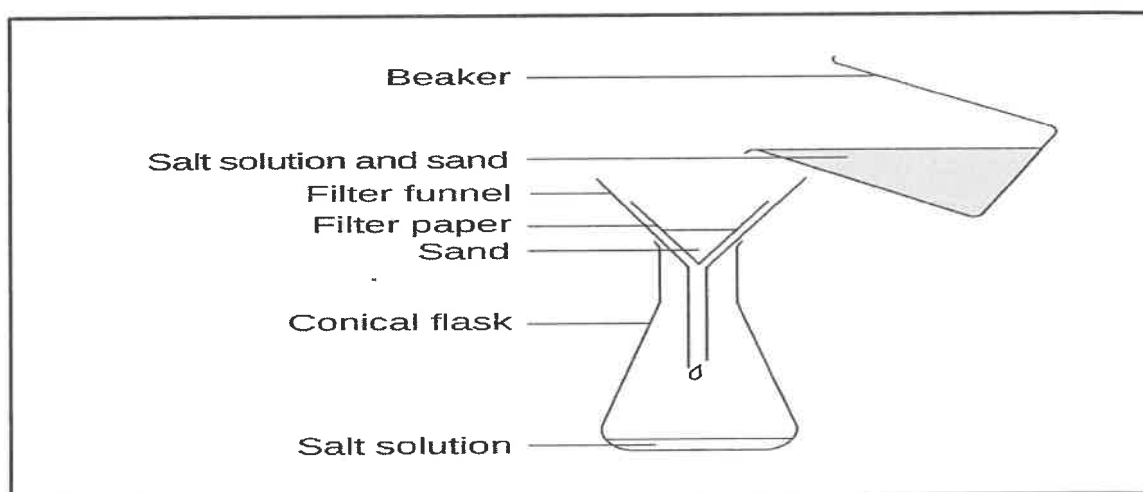
2.1 Explain the difference between solids and gases by referring to their particles.

HOW PARTICLES BEHAVE	SOLIDS	GASES
Movement of particles		
Arrangement of particles (DO NOT DRAW)		

[4]

QUESTION 3

Study the diagram below and answer the questions.



3.1 Provide a name for the process above.

(1)

3.2 Explain why the sand grains stay behind on the filter paper. (2)

3.3 What would happen if the mixture of salt and water was poured through the filter? (2)

3.4 Explain why the sorting by hand method would not work to separate the salt and water solution. (2)

3.5 Differentiate between *soluble* and *insoluble substances*. (2)

[9]

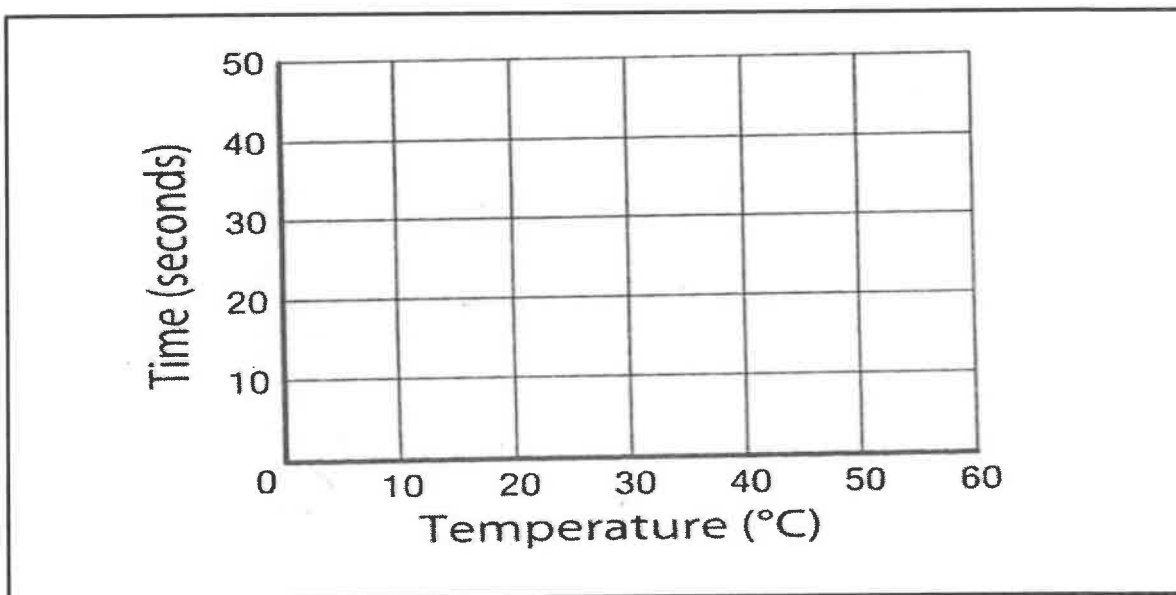
QUESTION 4

A grade 6 learner investigated how different temperatures of water affected the rate of dissolving of sugar. The learner recorded the results in the table below.

Study the results recorded below and answer the questions that follow.

Temperature (°C)	10	20	30	40
Time (s)	50	30	20	10

4.1 Use a pencil to construct a LINE GRAPH using the information from the table above. DRAW ON THE GRID below. (4)



4.2 Identify the independent variable from the graph. (1)

[5]

QUESTION 5

Read the following passage carefully and answer the questions that follow.

The water needed by plants, animals and humans is found in rivers, dams, springs, boreholes, wells etc. Most of our fresh water comes from rain, ground water and melting snow and ice that flow from catchment areas to wetlands, dams, rivers, oceans, lakes and oceans. Melting snow from mountain tops flows into rivers and people can use it because it is fresh water.

Wetlands are habitats for many animals, and they act as sponges that regulate the flow of water. Wetlands directly support human health and livelihoods, through the provision of food, fibre, water, and natural products to many communities. They are also sites for tourism, subsistence farming, grazing, education, recreation, and spiritual activities. About 60% of the wetlands in some catchment areas have been damaged or destroyed due to human activities.

A river's catchment area is all the land from which the river catches its water. When it rains, all the rainwater eventually soaks underground or flows into a river. The ground water and the water in the rivers flow into the sea. Human activity in a catchment area affects the quality of water that goes into the river.

5.1 Define the term *wetlands*. (2)

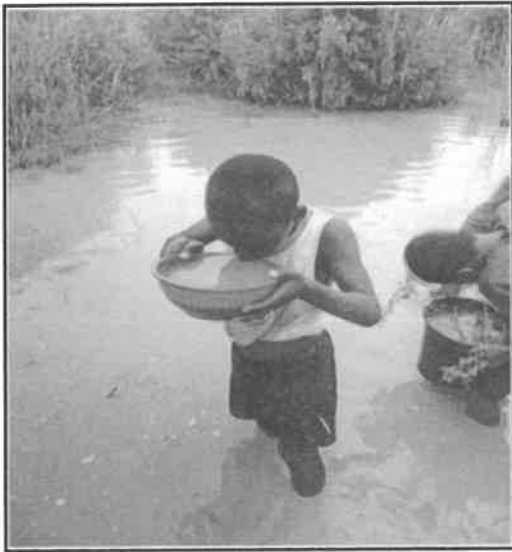
5.2 In FIVE points, explain the importance of wetlands. (5)

5.3 Name TWO human activities which can destroy the wetlands. (2)

[9]

QUESTION 6

Look at the picture below and answer the questions that follow.



6.1 Suggest FIVE methods people can use to make their water safe to drink. (5)

6.2 Why do humans and animals need clean water? Write a PARAGRAPH where you describe some of these needs. (3)

[8]

TOTAL: SECTION B: 35

GRAAND TOTAL: 50



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MEMORANDUM

MARKS: 50

SECTION A

QUESTION 1.1

1.1.1 D ✓

1.1.2 B ✓

1.1.3 ~~A~~ ✓ B

1.1.4 A ✓

1.1.5 B ✓

[5]

QUESTION 1.2

1.2.1 C ✓

1.2.2 F ✓

1.2.3 B ✓

1.2.4 E ✓

1.2.5 D ✓

[5]

QUESTION 1.3

1.3.1 Wetlands ✓

1.3.2 Solubility ✓

1.3.3 Contaminated / Contamination ✓

1.3.4 Separate / Separating/ Separation ✓ (ANY correct)

1.3.5 Evaporation ✓

[5]

SECTION B

QUESTION 2

2.1

(4)

HOW PARTICLES BEHAVE.	SOLIDS	GASES
Movement of particles	Particles cannot move or vibrate freely ✓	Particles move freely in all directions and move very fast. ✓
Arrangement of particles (Do not draw)	Particles are tightly packed together in a regular pattern. ✓	Particles have big spaces between them. ✓

QUESTION 3

3.1. A – Filtration ✓

3.2 The sand grains (solids) are big in size ✓ than the pores of the filter paper ✓

3.3 The salt will not be held by the filter paper ✓ ✓

3.4 Hand sorting can only separate solid mixtures ✓ and not solutions ✓

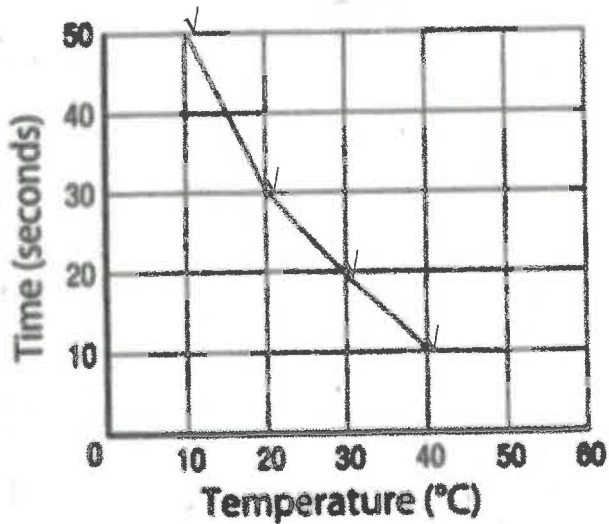
3.5 Soluble substances can dissolve in liquid ✓ whereas an insoluble substance cannot dissolve liquid ✓

[8]

QUESTION 4

4.1. Award a mark ✓ for the correct plotting points. (4)

NOTE: Penalize a learner a mark if the graph is drawn with a pen.



4.2 Temperature ✓

[5]

QUESTION 5

5.1 An area covered by shallow water for most of the year. ✓ ✓

5.2 Provide habitats for many animals and plants. ✓

Source of water for plants and animals (Support health and live hoods) ✓

Remove insoluble and soluble substances from the water ✓

Act as sponges that regulate the flow of water ✓

Catches or gathers water in dry season to keep rivers and streams flowing ✓

5.3 Pollution ✓

Climate change ✓ (any relevant answer)

[09]

QUESTION 6

6.1 Sieving ✓

Filtering ✓

Settling ✓

Decanting ✓

Boiling ✓ (any relevant and correct answer)

6.2 Animals need clean water ✓ so that they do not get diseases ✓ that will make them sick. Water is the most important nutrient for animals. ✓

[8]

SECTION A – 15

SECTION B – 35

