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BASELINE TEST

NATURAL SCIENCE

2024

GRADE 9

Time: 2 Hours
Marks: 90 Marks
No. Of Pages: 8

INSTRUCTIONS TO LEARNERS

Answer **ALL** the questions.

The diagrams in this question paper may not be drawn to scale.

Write neatly and legibly.

This question paper consists of **8** pages

Grade 9 Natural Sciences Baseline Test

SECTION A

QUESTION 1

1.1 Various options are provided as answers to the following questions. Choose the correct answer and write ONLY the LETTER(A-D) next to the QUESTION NUMBER (1.1.1-1.1.10) on your answer sheet, for example 1.1.11 D.

1.1.1 Structure responsible for carrying sperm cells to the vagina:

- A Urethra
- B Penis
- C Sperm duct
- D Ureter

1.1.2 Which of the following is NOT a sub-atomic particle?

- A Electrons
- B Protons
- C Neutrons
- D Nucleons

1.1.3 What is the prefix for 4 atoms?

- A Di-
- B Tetra-
- C Penta-
- D Tri-

1.1.4 The following organelle is responsible for supporting plant cells:

- A Cell wall
- B Cell membrane
- C Vacuole
- D Cytoplasm

1.1.5 Element at group 14, period 2 on the periodic table...

- | | | | |
|---|---------|---|----------|
| A | Carbon | B | Nitrogen |
| C | Silicon | D | Oxygen |

1.1.6 The following is an example of a non-metal:

- A Silicon
- B Lithium
- C Magnesium
- D Carbon

1.1.7 Substances on the right side of a chemical equation:

- A Products
- B Reactants
- C Metals
- D Non-metals

1.1.8 Which of the following is NOT a way to prevent rust?

- A Galvanisation
- B Electrolysis
- C Paint
- D Oil or grease

1.1.9 Substance with a pH higher than 7:

- A Lemon Juice
- B Neutral
- C Acidic
- D Alkaline

1.1.10 An acid would turn _____ with universal indicator.

- A Green
- B Violet
- C Colourless
- D Red

[10x1]

1.2 Provide the correct TERM for the following descriptions. Write ONLY the correct TERM next to the QUESTION NUMBER (1.2.1-1.2.7) on your answer sheet.

1.2.1 Measure of how strongly acidic or alkaline a substance is.

1.2.2 Reaction of a substance with oxygen.

1.2.3 Process whereby the ovaries release an egg cell.

1.2.4 Tissue rich in blood vessels that provides the foetus with oxygen and nutrients.

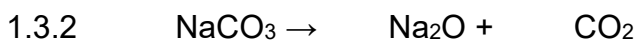
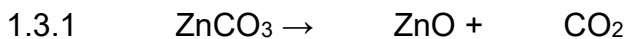
1.2.5 H_2 , O_2 , Br_2 , I_2 .

1.2.6 Name for groups 3 to 12 on the periodic table.

1.2.7 When acids and bases react with each other. **[1x7]**

1.3 Balancing equations are extremely important to ensure anyone can follow the chemical reaction and get the required products.

Balance the follow equations. REWRITE the equations on your answer sheet and fill in the blanks.



1.4 The following table summarises elements and their properties. Complete the table by filling in the answers from question **1.4.1 – 1.4.15**. ONLY write the correct ANSWER next to the QUESTION NUMBER on your answer sheet.

Symbol	Element Name	Atomic number	Number of Electrons	Number of Protons	Number of Nucleons
Na	1.4.1	1.4.2	1.4.3	1.4.4	1.4.5
1.4.6	Potassium	1.4.7	1.4.8	1.4.9	1.4.10
1.4.11	1.4.12	9	1.4.13	1.4.14	1.4.15

[1x15]

[Total Section A: 40]

SECTION B QUESTION2:

2.1 Elements on the periodic table can be used to make several compounds. These compounds have names but can also be written as formulas.

2.1.1 Write the formula for the following compounds:

2.1.1.1 Potassium, chlorine and oxygen in the ration 1:1:3 (1)

2.1.1.2 2 oxygen atoms (1)

2.1.2 Give the **chemical** names of the following compounds:

2.1.2.1 KNO₃ (1)

2.1.2.2 MgSO₄ (1)

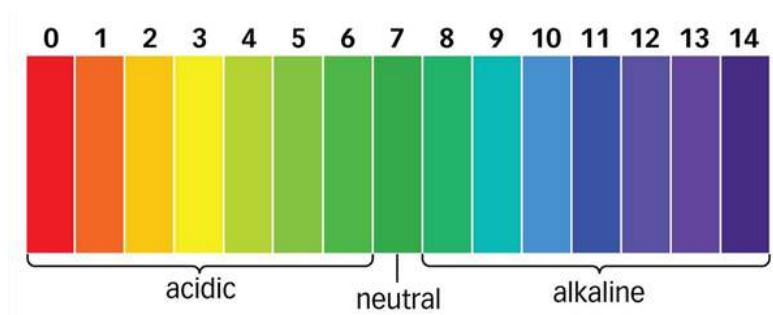
2.1.3 Calculate the number of atoms present of each element in the following compound.

2.1.3.1 2(NH₃)₂SO₄ (4)

[8]



2.2 Use the index of universal indicator colours below to answer the questions that follow.



Jared tested FIVE household substances using universal indicator. He obtained the following results:

Household substance	Colour of universal indicator solution	pH value
Distilled water	Green	2.2.1.1
Lemon juice	2.2.1.2	2
Handy Andy	2.2.1.3	10
Hand soap	Dark blue	2.2.1.4
Milk	Yellow	2.2.1.5

2.2.1 Complete the results table. Write ONLY the answer next to the QUESTION NUMBER on your answer sheet. (5)

2.2.2 Define an *indicator*. (1)

2.2.3 Would normal tap water also turn green with universal indicator? (1)

2.2.4 Give a reason for your answer in QUESTION 2.2.3. (1)

2.2.5 Give ONE possible reason why the milk didn't turn green as normally the case. (1)

2.2.6 Why do you think Jared used universal indicator instead of litmus paper? (1)

2.2.7 Give TWO examples of homemade indicators Jared could have used. (2)

[12]

2.3 A neutralisation reaction is a reaction between an acid and a base. It would alter the pH of the solution to bring it closer to 7.

The lab assistant performs the following neutralisation reaction: Hydrochloric acid is added to lithium oxide.

2.3.1 What products would form from this reaction? (2)

2.3.2 Write a balanced chemical equation for this neutralisation reaction. (5)

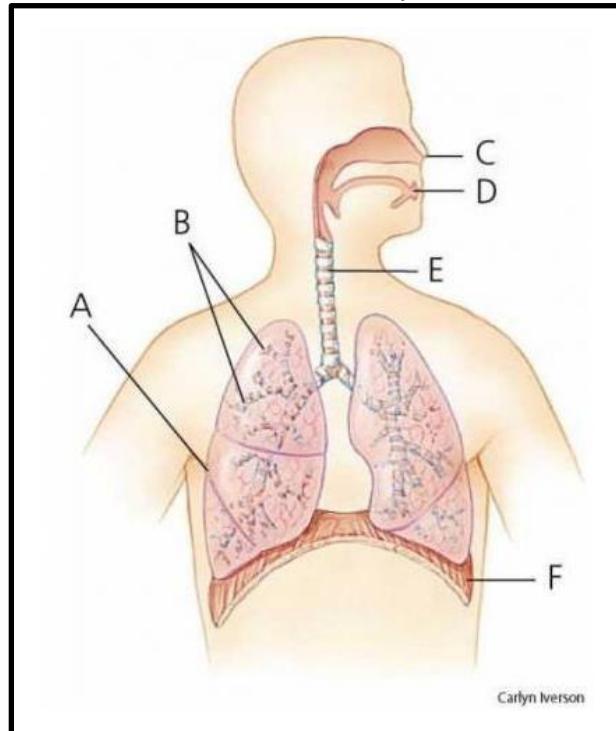
2.3.3 What products would form from an acid and metal carbonate reaction? (3)

[10]

Question 2: 30

QUESTION 3

3.1 Study the diagram below and answer the questions that follow:



3.1.1 Which body system is represented in the diagram above? (1)

3.1.2 Provide labels for structures **B** and **E**. (2)

3.1.3 What is the function of structure **F** during inhalation? (1)

3.1.4 Give ONE reason why it is better to breathe through your nose than mouth. (1)

3.1.5 What is the name of the disease associated with this body system that is caused by bacteria? (1)

[6]

3.2. The following table shows average height for a group of boys and girls at different ages.

Age (years)	8	9	10	11	12	13	14	15	16
Height Girls (cm)	130	135	141	146	151	154	156	158	159
Height Boys (cm)	130	136	141	145	151	158	162	168	171

3.2.1 State the independent variable. (1)

3.2.2 State the dependent variable. (1)

3.2.3 Use the graph paper attached to draw a LINE GRAPH of the data above. (6)

3.2.4 Give ONE possible reason why boys are taller than girls. (1)

3.2.5 Give ONE possible reason why boys suddenly experience a significant growth at age 12 years. (1)

[10]

3.3 Study the balanced diet below and answer the questions that follow.



3.3.1 Give ONE reason why humans require food. (1)

3.3.2 What can happen if a person doesn't eat enough proteins? (1)

3.3.3 Why do we require fats in our diet? (1)

3.3.4 What is the seventh building block we require, that is **not** on this diagram? (1)

[4]

Question 3: 20

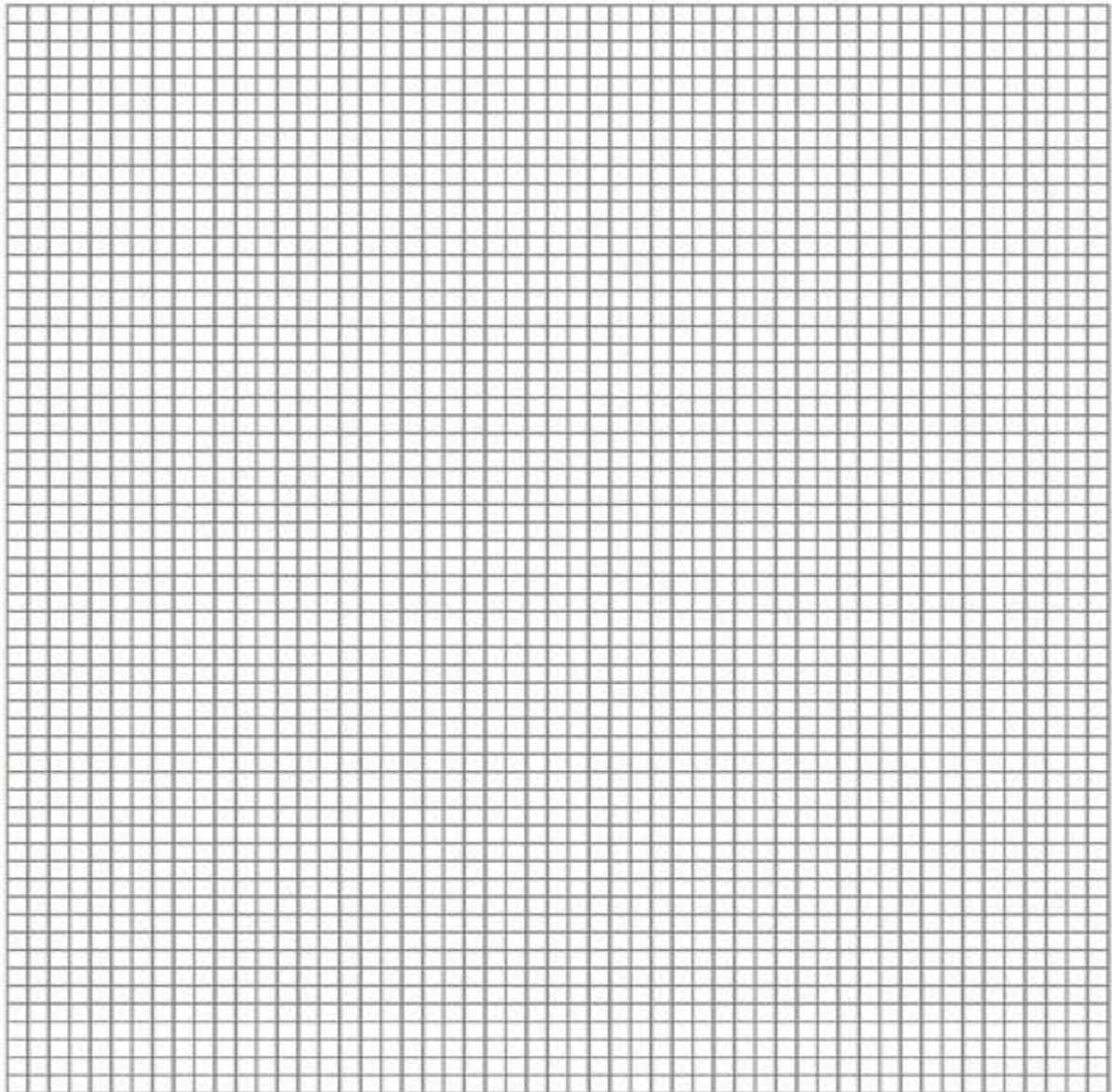
[Total Section B: 50] GRAND TOTAL: 90 MARKS

PERIODIC TABLE OF THE ELEMENTS

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
140.12	140.91	144.24	(145)	150.4	151.97	157.25	158.93	162.50	164.93	167.26	168.93	173.04	174.97
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
232.04	231.04	238.03	237.05	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(262)

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GRAPH PAPER



Memorandum Baseline – Grade 9

<u>Question Number</u>	<u>Answer</u>	<u>Marks</u>
Question 1.1 (10 marks)		
1.1.1	A✓	1
1.1.2	D✓	1
1.1.3	B✓	1
1.1.4	C✓	1
1.1.5	A✓	1
1.1.6	D✓	1
1.1.7	A✓	1
1.1.8	B✓	1
1.1.9	D✓	1
1.1.10	D✓	1
Question 1.2 (7 marks)		
1.2.1	pH✓	1
1.2.2	Combustion/Burning✓	1
1.2.3	Ovulation✓	1
1.2.4	Placenta✓	1
1.2.5	Diatomic molecules✓	1
1.2.6	Transition elements/metals✓	1
1.2.7	Neutralisation✓	1
Question 1.3 (8 marks)		
1.3.1	1✓ZnCO ₃ → 1✓ZnO + 1✓CO ₂ Can NOT accept 2:2:2	3
1.3.2	2✓NaCO ₃ → 1✓Na ₂ O + 2✓CO ₂	3

1.3.3	$1\sqrt{\text{N}_2} + 3\sqrt{\text{H}_2} \rightarrow 2 \text{NH}_3$	2
Question 1.4 (15 marks)		
1.4.1	Sodium✓	1
1.4.2	11✓	1
1.4.3	11✓	1
1.4.4	11✓	1
1.4.5	22✓	1
1.4.6	K✓	1

1.4.7	19✓	1
1.4.8	19✓	1
1.4.9	19✓	1
1.4.10	39✓	1
1.4.11	F✓	1
1.4.12	Flourine✓	1
1.4.13	9✓	1
1.4.14	9✓	1
1.4.15	19✓	1
Question 2.1 (8 marks)		
2.1.1.1	KClO ₃ ✓	1
2.1.2.1	O ₂ ✓	1
2.1.2.1	Potassium Nitrate✓	1
2.1.2.2	Magnesium Sulphate✓	1
2.1.3.1	2x2 = 4N✓ 3x2x2 = 12H✓ 1S✓ 4O✓	4

Question 2.2 (12 marks)		
2.2.1.1	6-8✓	1
2.2.1.2	Orange✓	1
2.2.1.3	Light blue✓	1
2.2.1.4	11✓	1
2.2.1.5	3✓	1
2.2.2	Dye/chemical that change colour in the presence of acids, bases and neutral substances✓	1
2.2.3	No✓	1
2.2.4	It is not pure. Would most likely be more alkaline. Any relevant answer.✓	1
2.2.5	The milk is sour.✓	1
2.2.6	Universal indicator is more accurate because litmus paper can only indicate if it is an acid and base whereas universal indicator indicate pH level too.✓	1
2.2.7	ANY TWO: Red cabbage water, red onion water✓ Turmeric✓	2
Question 2.3 (10 marks)		
2.3.1	Salt✓ + water✓/lithium chloride salt + water	2
2.3.2	$2\text{HCl}✓ + \text{Li}_2\text{O}✓ \rightarrow 2\text{LiCl}✓ + \text{H}_2\text{O}✓$	5
	Last mark for balancing	
2.3.3	Salt✓ + carbon dioxide✓ + water✓	3
Question 3.1 (6 marks)		
3.1.1	Respiratory system✓	1
3.1.2	B - bronchi✓ E - trachea✓ NO marks if letters not specified	2
3.1.3	Diaphragm contracts and pulls down to allow maximum air to move into the lungs✓	1

3.1.4	The nose filters and warms the air✓	1
3.1.5	Tuberculosis✓	1
Question 3.2 (10 marks)		
3.2.1	Age✓	1
3.2.2	Height✓	1
3.2.3	C - caption✓ T – line graph✓ L – x-axis with units ✓ & y-axis with units✓ P – plotting: all correct✓✓ 1 mistake✓	6
3.2.4	Higher level of testosterone✓	1
3.2.5	Puberty✓	1
Question 3.3 (4 marks)		
3.3.1	ANY ONE: fuel, building blocks, regulatory substances, healthy body✓	1
3.3.2	Kwashiorkor✓	1
3.3.3	ANY ONE: Energy source, insulation✓	1
3.3.4	Water✓	1
		TOTAL – 90 marks