 **KENYA JUNIOR SCHOOL EDUCATION ASSESSMENT**

 **KEJSEA ENDTERM ONE 2025**

 **GRADE 9**

 **905/2- INTEGRATED SCIENCE (THEORY)**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Duration:** 2 ¾ Hours
**Total Marks:** 70 marks

 **FOR FACILITATOR’S USE ONLY**

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| --- | --- | --- | --- | --- |
| SCORE RANGE  | 60-69 | 50-59 | 26-49 | 0-25 |
| LEVEL  | EXCEEDING EXPECTATION | MEETING EXPECTATION | APPROACHING EXPECTATION | BELOW EXPECTATION |
| LEARNER’S SCORE |  |  |  |  |
| TICK LEVEL |  |  |  |  |

**General Instructions:**

* **Be clear and concise**: Answer the question directly without unnecessary details. Stick to the key points.
* **Use Diagrams**: If required, draw clear and labeled diagrams to support your answers. This can help in visualizing concepts.
* **Show Your Work**: For calculations, always show the steps and formulae you use. Even if you make an error in the final answer, you may get marks for the method.
* **Answer All Parts of the Question**: Ensure you answer every sub-question. If a question has multiple parts, each part will be marked separately.

**QUESTIONS**

1. **Which of the following is an example of a physical change?**
	* A) Burning wood
	* B) Dissolving sugar in water
	* C) Rusting of iron
	* D) Cooking an egg
2. **Which of the following forms of energy is associated with the movement of objects?**
	* A) Thermal energy
	* B) Kinetic energy
	* C) Electrical energy
	* D) Chemical energy
3. **Which of the following is a characteristic of living organisms?**
	* A) They grow and develop
	* B) They cannot reproduce
	* C) They do not need energy
	* D) They do not respond to their environment
4. **What is the main function of the human circulatory system?**
	* A) To digest food
	* B) To pump blood around the body
	* C) To remove waste from the body
	* D) To provide oxygen to cells
5. **Which of the following is a chemical change?**
	* A) Melting of ice
	* B) Burning of paper
	* C) Dissolving salt in water
	* D) Freezing of water
6. **Which of the following is NOT a function of the human respiratory system?**
	* A) To provide oxygen to the blood
	* B) To expel carbon dioxide from the body
	* C) To regulate body temperature
	* D) To prevent pathogens from entering the lungs
7. **Which of the following elements is most commonly found in organic compounds?**
	* A) Nitrogen
	* B) Oxygen
	* C) Carbon
	* D) Hydrogen
8. **Which of the following is a primary source of energy for plants during photosynthesis?**
	* A) Water
	* B) Soil nutrients
	* C) Sunlight
	* D) Oxygen
9. **What type of energy is stored in the food we eat?**
	* A) Kinetic energy
	* B) Potential energy
	* C) Chemical energy
	* D) Thermal energy

**SECTION B**

**Question 1:**

a) Define energy transformation. (2 marks)

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b) A person uses a bicycle to climb a hill. What energy transformations occur during this process? (4 marks)

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**Question 2:**

a) List any two enzymes involved in digestion. (2 marks)

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b) Explain the role of bile in digestion. (3 marks)

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**Question 3:**

a) Define the term "force." (2 marks)

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b) A car which weighs 2000kg lies on an area of 10m2 with the tarmac. What pressure does it apply on the tarmac? (3 marks)

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**Question 4:**

a) State the law of reflection. (2 marks)

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b) A light ray strikes a mirror at an angle of 30°. What is the angle of reflection? (2 marks)

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**Question 5:**

a) Identify the part of the digestive system where the absorption of nutrients mainly occurs. (1 mark)

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b) What role do the villi in the small intestine play? (3 marks)

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**Question 8 :**

**Atoms and the Periodic Table**
a. Define an atom and state the three subatomic particles, their charges, and locations in the atom.

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b. The element Sodium (Na) has an atomic number of 11 and a mass number of 23.
i. Determine the number of protons, neutrons, and electrons in a sodium atom.

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ii. Write the electronic configuration of sodium.

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**Question 9**
a. State two properties of elements in Group 1 (alkali metals) of the periodic table.

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b. Explain why elements in the same group have similar chemical properties.

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**Question 10:**
a. Give three physical properties and three chemical properties of metals.

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b. Iron (Fe) reacts with oxygen and water to form rust. Write the word equation for this reaction.

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c. List two methods used to prevent rusting in metals.

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**MARKING SCHEME**

**ANSWERS**

1. **Which of the following is an example of a physical change?**

 *Correct answer: B) Dissolving sugar in water*

1. **Which of the following forms of energy is associated with the movement of objects?**
*Correct answer: B) Kinetic energy*
2. **Which of the following is a characteristic of living organisms?**
*Correct answer: A) They grow and develop*
3. **What is the main function of the human circulatory system?**
*Correct answer: B) To pump blood around the body*
4. **Which of the following is a chemical change?**
*Correct answer: B) Burning of paper*
5. **Which of the following is NOT a function of the human respiratory system?**
*Correct answer: C) To regulate body temperature*
6. **Which of the following elements is most commonly found in organic compounds?**
*Correct answer: C) Carbon*
7. **Which of the following is a primary source of energy for plants during photosynthesis?**
*Correct answer: C) Sunlight*
8. **What type of energy is stored in the food we eat?**
*Correct answer: C) Chemical energy*

**SECTION B**

**Question 1:**

**Answer:**

* a) Energy transformation is the process of changing one form of energy into another.
* b) The person uses chemical energy stored in their muscles, which is converted into mechanical energy to pedal the bicycle. As the bicycle moves uphill, mechanical energy is also transformed into potential energy (due to the increase in height).

**Question 2:**

**Answer:**

* a) Amylase and lipase
* b) Bile aids in the digestion of fats by emulsifying them, which increases the surface area for enzymes like lipase to act on, speeding up the digestion process.

**Question 3:**

**Answer:**

* a) Force is a push or pull on an object that can cause it to move or change its motion.
* b) $P=\frac{F}{A}$

F=$\frac{2000KG}{10}=200N$

A=10M2

P=$\frac{200N}{10M2}$

P=20N/M2 OR 20 Pascals

**Question 4:**

**Answer:**

* a) The law of reflection states that the angle of incidence is equal to the angle of reflection.
* b) The angle of reflection will also be 30°, since the angle of incidence is equal to the angle of reflection.

**Question 5:**

**Answer:**

* a) The small intestine
* b) Villi increase the surface area of the small intestine, allowing more nutrients to be absorbed into the bloodstream. They also contain blood vessels that carry absorbed nutrients to the rest of the body.

**Question 8.**

a. **Definition of an atom**:
An atom is the smallest unit of matter that retains the properties of an element.

**Subatomic particles, their charges, and locations**:

* **Proton**: Positive charge (+1), located in the nucleus.
* **Neutron**: No charge (neutral), located in the nucleus.
* **Electron**: Negative charge (-1), located in the electron cloud around the nucleus.

b. **Sodium (Na)**:
i. **Protons** = 11 (equal to the atomic number)
**Electrons** = 11 (equal to the number of protons in a neutral atom)
**Neutrons** = Mass number – Atomic number = 23 – 11 = 12

ii. **Electronic configuration of sodium**:
2,8,12, 8, 12,8,1

**question 9.**

a. **Properties of Group 1 elements (alkali metals):**

1. They are soft and can be cut with a knife.
2. They react vigorously with water to form an alkaline solution and hydrogen gas.

b. **Explanation of similar chemical properties in the same group**:
Elements in the same group have the same number of valence electrons, which determines their chemical reactivity.

**Question 10**

a. **Physical properties of metals**:

1. Metals are good conductors of heat and electricity.
2. They are malleable (can be hammered into thin sheets).
3. They are shiny (lustrous).

**Chemical properties of metals**:

1. Metals react with oxygen to form metal oxides.
2. Metals react with acids to produce hydrogen gas.
3. Metals form positive ions by losing electrons during chemical reactions.

b. **Word equation for rusting**:
Iron + Oxygen + Water → Hydrated Iron (III) Oxide (Rust)

c. **Methods to prevent rusting**:

1. Painting or coating with oil/grease.
2. Galvanization (coating with zinc).

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**RUBRICS**

**SECTION A**

| **Criteria** | **Level 1 (1 mark)** | **Level 2 (2 marks)** | **Level 3 (3 marks)** | **Level 4 (4 marks)** |
| --- | --- | --- | --- | --- |
| **Knowledge of Content** | Demonstrates little or no understanding of the concept | Demonstrates a basic understanding of the concept | Demonstrates a good understanding of the concept | Demonstrates a deep understanding of the concept |
| **Answer Accuracy** | Selects a mostly incorrect answer or no answer at all | Selects a partially correct answer or is unsure | Selects a mostly correct answer with a small mistake | Selects the correct answer with full confidence |
| **Application of Concepts** | Unable to apply the concept to the question | Able to apply the concept with some assistance | Applies the concept correctly and independently | Applies the concept correctly with detailed insight |
| **Reasoning** | No reasoning or explanation given | Minimal reasoning or explanation | Clear reasoning with adequate explanation | Clear, detailed reasoning with thorough explanation |

**SECTION B**

**Rubric for Assessing Structured Questions NO.1-7**

| **Criteria** | **Level 1 (1-2 marks)** | **Level 2 (3-4 marks)** | **Level 3 (5-6 marks)** | **Level 4 (7-8 marks)** |
| --- | --- | --- | --- | --- |
| **Understanding of the Question** | Fails to understand the question | Demonstrates partial understanding of the question | Demonstrates good understanding of the question | Demonstrates thorough understanding of the question |
| **Accuracy of Information** | Provides mostly incorrect information or irrelevant details | Provides partially correct or incomplete information | Provides mostly correct information with minor errors | Provides accurate, detailed, and relevant information |
| **Clarity and Organization** | Response is unclear, poorly organized | Response is somewhat clear but lacks structure | Response is clear and mostly well-organized | Response is very clear, logically organized, and concise |
| **Application of Concepts** | Cannot apply concepts to the question | Applies some concepts correctly, but with limited accuracy | Applies concepts accurately and mostly independently | Applies concepts fully and confidently, with detailed support |
| **Diagrams (if applicable)** | No diagrams or incorrect diagrams | Provides a basic or incomplete diagram | Provides a clear and accurate diagram | Provides a detailed and well-labeled diagram |

**NO.8-10**

| **Question** | **Criteria** | **Marks** | **Remarks** |
| --- | --- | --- | --- |
| **1a. Definition of an Atom** | Correct definition and explanation | 2 |  |
| **1a. Subatomic Particles** | Names, charges, and locations (1 mark each) | 3 |  |
| **1bi. Sodium Atomic Details** | Correct calculation of protons, neutrons, electrons | 3 | 1 mark for each value |
| **1bii. Electronic Configuration** | Correct configuration (2, 8, 1) | 1 |  |
| **2a. Properties of Group 1 Metals** | 1 mark for each correct property | 2 |  |
| **2b. Group Similarities** | Clear explanation with focus on valence electrons | 2 |  |
| **3a. Physical Properties of Metals** | 1 mark for each correct property (max 3) | 3 |  |
| **3a. Chemical Properties of Metals** | 1 mark for each correct property (max 3) | 3 |  |
| **3b. Word Equation** | Correct and complete equation | 2 | 1 mark if partially correct |
| **3c. Rust Prevention Methods** | 1 mark for each correct method | 2 |  |

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