

Province of the

**EASTERN CAPE**

EDUCATION

**SENIOR PHASE**

**GRADE 9**

**JUNE 2010**

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| **NATURAL SCIENCES** |

**MARKS: 100**

**TIME: 2 hours**

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| This question paper consists of 10 pages. |

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| **INSTRUCTIONS AND INFORMATION** | |  |
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| 1. | This question paper consists of 10 pages. |  |
|  |  |  |
| 2. | Read all the questions carefully before you start writing. |  |
|  |  |  |
| 3. | Answer all questions in the answer sheet provided. |  |
|  |  |  |
| 4. | Number your answers correctly as it is in the question paper. |  |
|  |  |  |
| 5. | Write neatly and legibly. |  |

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| **QUESTION 1** | | | |  |
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| Various possibilities are suggested as answers to the following questions. Choose the correct answer and write the letter representing your chosen answer next to the question number in your answer sheet. | | | |  |
|  | | | |  |
| 1. | 1.1 | | Which of the following natural phenomena is related to static electricity?  A. cloud  B. rainbow  C. lightening  D. rain | (2) |
|  |  | |  |  |
|  | 1.2 | | An electric current consists of … that move in an electric circuit.  A. atoms  B. elements  C. molecules  D. electric charges | (2) |
|  |  | |  |  |
|  | 1.3 | If three cells of 1 V , 1,5 V and 3,5 V are connected in series, the total voltmeter reading across the battery will be …  A. 1 V.  B. 1,5 V.  C. 3,5 V.  D. 6 V. | | (2) |
|  |  |  | |  |
|  | 1.4 | The basic unit of life is the …   1. cytoplasm. 2. tissue. 3. cell. 4. organ. | | (2) |
|  |  |  | |  |
|  | 1.5 | Which of the following structures is found in a plant cell but not in an animal cell?  A. cell membrane  B. nucleus  C. vacuole  D. cell wall | | (2) |
|  |  |  | |  |
|  | 1.6 | Kimberley is known for its Big Hole and … mining.   1. diamond 2. platinum   C. gold  D. copper | | (2) |
|  |  |  | |  |

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|  | 1.7 | How many different elements make up magnesium hydroxide [Mg(OH)2]?  A. 3  B. 6  C. 5  D. 2 | | | (2) |
|  |  |  | | |  |
|  | 1.8 | Molten rock that is found inside the earth and, is called …  A. magma.  B. rock.  C. lava.  D. crust. | | | (2) |
|  |  |  | | |  |
|  | 1.9 | Combustion involves the reaction of a substance with …  A. water.  B. sulphur.  C. oxygen.  D. heat. | | | (2) |
|  |  |  | | |  |
|  | 1.10 | Which of the following oxides is written incorrectly?  A. H2O  B. CO2  C. FeO  D. MgO2 | | | (2) |
|  |  |  | | | **[20]** |
| **QUESTION 2** | | | | |  |
|  | | | | |  |
| Match each of the descriptions in column A with one of the terms in column B.  Write the question number in the answer sheet and the letter of your chosen answer next to the question number. | | | | |  |
|  | | | | |  |
| **COLUMN A** | | | **COLUMN B** | |  |
| 2.1 | The energy of motion | | A | Gravitation |  |
| 2.2 | The unit of resistance | | B | Diffusion |  |
| 2.3 | The transfer of heat energy through space | | C | Kinetic energy |  |
| 2.4 | A non-contact force between one mass and another | | D | Watt |  |
| 2.5 | The unit of power | | E | Condensation |  |
| 2.6 | The transfer of heat energy through a liquid or a gas | | F | Convection |  |
| 2.7 | The change of phase from liquid to gas | | G | Newton |  |
| 2.8 | The unit of current | | H | Ohm |  |
| 2.9 | The change of phase from liquid to solid | | I | Evaporation |  |
| 2.10 | A cohesive force between two objects sliding over one another | | J | Friction |  |
|  |  | | K | Radiation |  |
|  |  | | L | Potential energy |  |
|  |  | | M | Solidification |  |
|  |  | | N | Ampère |  |
|  |  | | O | Coulomb |  |
|  |  | | (10 x 1=10) | | **[10]** |

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| **QUESTION 3: Life and Living** | | |  |
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| Organisms need energy, which is essential for all life processes. Plants make food during the process of photosynthesis. This food is broken down during cellular respiration by oxygen, in both plants and animals to release energy.  Study the following equations where the **E** represents energy: | | |  |
| **Equation 1**  Carbohydrate + oxygen carbon dioxide + water + **E** | | |  |
| **Equation 2**  Carbon dioxide + water + **E** carbohydrate + oxygen | | |  |
| 3.1 | Which equation represents the process of cellular respiration? | | (1) |
|  |  | |  |
| 3.2 | Where does the energy represented by **E** in equation 2 come from? | | (1) |
|  |  | |  |
| 3.3 | Name TWO compounds in equation 1. | | (2) |
|  |  | |  |
| 3.4 | Use the information above, to advise why it may not be a good idea to have plants where you sleep at night. | | (2) |
|  |  |  | **[6]** |
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| **QUESTION 4 Life and Living** | | |  |
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| Study the following extracts and answer the question that follow.  Answer the questions as comprehensively as possible.  **Pathogenic Organism: Viruses and Bacteria**  Pathogenic organisms are organisms that cause diseases. They live parasitically on other organisms. Bacteria and viruses are pathogenic organisms.  A virus cannot be classified as a true cell. It only consists of a protein capsule that surrounds the nucleic acid. (A nucleic acid is a molecule that carries genetic information, for example DNA or RNA). Bacteria on the other hand, are organisms that contain nuclear material and are surrounded by a membrane.  Viruses are very small. Their sizes vary from 10 nm (nanometer) to 200 nm. They have symmetrical shapes and are usually distributed by means of food, contact or carriers. Viruses show no characteristics of life. They can only multiply inside living organisms. They are also able to infest bacteria. Such a virus is known as a bacteriophage. Examples of disease caused by viruses are colds, influenza, polio, chicken pox, blisters and Aids.  Bacteria occur everywhere on earth; in the air, in water, in soil, in dead or living matter. Some can live in the presence of oxygen and others in the absence of oxygen. Their sizes vary from 5µm to less than 1µm (micrometer). They reproduce very fast and form visible colonies. Bacteria are classified in three main groups according to their shape: spherical [cocci], rod-shaped [bacilli] and spiral- shaped [spirilum].  Some bacteria are useful, for example fermenting bacteria (Acetic acid bacteria and Lactic acid bacteria).These bacteria are of economical importance for humans, for example, lactic acid bacteria convert milk into sour milk. Harmful bacteria cause diseases (tuberculosis, diphtheria and gastric fever), and make food rot.  Tuberculosis, caused by bacteria, is a leading opportunistic infection and cause of death among people with HIV. If treated soon enough, TB is curable, but Multi-drug resistant TB (MDR TB) and Extensive -drug resistant TB (XDR TB) are now on the increase in countries with high HIV cases; and when MDR- and XDR-TB occur among people living with HIV, many die quickly before they are appropriately diagnosed. | | |  |
|  |  | |  |
| 4.1 | What is the size of a: | |  |
|  |  | |  |
|  | a) | Virus? | (1) |
|  |  |  |  |
|  | b) | Bacterium? | (1) |
|  |  |  |  |
| 4.2 | Name at least TWO differences between bacteria and viruses. | | (4) |
|  |  | |  |
| 4.3 | Why are illnesses such as TB regarded as opportunistic infections? | | (2) |
|  |  | |  |
| 4.4 | Name THREE diseases that are caused by harmful bacteria. | | (3) |
|  |  | |  |
| 4.5 | What do the following acronyms stand for? | |  |
|  |  |  |  |
|  | a) | Aids | (1) |
|  |  |  |  |
|  | b) | XDR-TB | (1) |
|  |  |  |  |
|  | c) | MDR-TB | (1) |
|  |  |  | **[14]** |

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| **QUESTION 5: Energy and Change** | |  |
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| Consider the circuit represented by the following diagram and then answer all the questions that follow.  **36 Ώ**  **60 V**  **24 Ώ**  **A**    **V** | |  |
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| 5.1 | Calculate the effective resistance of the circuit. Use the formula:  Total Resistance = Resistance 1 + Resistance 2 or RT = R1 + R2 | (3) |
| 5.2 | What will the reading be on the ammeter? Use formula:  Current (I) =Volt (V)  Resistance (R) | (3) |
|  |  |  |
| 5.3 | What will the reading be on the voltmeter? Use formula:  Volt (V) = Current (I) x Resistance (R) | (3) |
|  |  |  |
| 5.4 | What would be the effect, on the effective resistance of the circuit, if another resistor is added, in parallel with the 36Ώ resistor? | (2) |
|  |  | **[11]** |
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| **QUESTION 6: Matter and Materials** | |  |
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| Study the Periodic Table **(Appendix 1)** and answer the questions that follow. | |  |
|  | |  |
| 6.1 | The elements found in the periodic table are divided into two main groups:  On the left are the 6.1 (a) and on the right the 6.1 (b) . | (2) |
|  |  |  |
| 6.2 | Mention the TWO elements that occur as liquids at room temperature. | (2) |
|  |  |  |
| 6.3 | Mention any FOUR elements that occur as gases at room temperature. | (4) |
|  |  |  |
| 6.4 | Name the group of elements that will never react with other elements. | (1) |
|  |  |  |
| 6.5 | Which element is the “lightest” (lowest density)? | (1) |
|  |  |  |

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| 6.6 | Write down the names of the elements or compounds from the symbols or formulae below:   1. He 2. NaCl 3. CuSO4 4. Pb 4 x 1 | | (4) |
|  |  | |  |
| 6.7 | Write down the formulae and names of the following compounds:   1. Consist of calcium, carbon and oxygen in the ratio of 1:1:3. 2. Consist of sodium, sulphur and oxygen in the ratio of 2:1:4. 3. Consist of nitrogen, hydrogen and chlorine in the ratio of 1:4:1. 3 x 1 | | (3) |
|  |  |  | **[17]** |
|  |  |  |  |
| **QUESTION 7** | | |  |
|  |  |  |  |
| For each of the diagrams below decide if a mixture, a compound or a single element is illustrated. | | |  |
| **A B C D** | | | **[4]** |

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| **QUESTION 8** | | |  |
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| Use the model key for each element and write the chemical formula for each molecule. | | | **[8]** |
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| **QUESTION 9** | | |  |
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| Study the following reactions; write down the equations and balance where it is necessary. | | |  |
|  | | |  |
| 9.1 | copper carbonate copper(II) oxide + carbon dioxide | | (1) |
|  |  |  |  |
| 9.2 | mercury oxide mercury + oxygen | | (2) |
|  |  |  |  |
| 9.3 | ammonium carbonate ammonia + carbon dioxide + water vapour | | (2) |
|  |  |  |  |
| 9.4 | zinc + hydrochloric acid zinc chloride + hydrogen | | (2) |
|  |  |  |  |
| 9.5 | calcium carbonate + H2SO4  calcium sulphate + carbon dioxide + water | | (2) |
|  |  |  |  |
| 9.6 | sodium hydroxide + hydrochloric acid sodium chloride + water | | (1) |
|  |  |  | **[10]** |
|  |  |  |  |
|  |  | **TOTAL MARKS:** | **100** |

**Appendix A**

