**Chemical elements (answers)**

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| Instructions to students  • You have 50 minutes to complete the test.  • Please answer all questions in the spaces provided.  • There is to be no talking during the test. | Marks  Section I: Multiple-choice questions: 5 marks  Section II: Short-answer questions: 10 marks  Section III: Extended-response questions: 10 marks  Total: 25 marks |

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| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Score: /25  Grade: % |
| Comments: | |

Section I: Multiple-choice questions

For each question, circle or highlight the correct answer.

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| 1 What process is shown in this diagram? | |  |
| A | Diffusion |
| B | Expansion |
| C | Freezing |
| D | Viscosity |
| 2 Mass is measured in: | | |
| A | inches. | |
| B | metres. | |
| C | kilograms. | |
| D | litres. | |
| 3 Which of the following lists what a substance does during a chemical reaction? | | |
| A | Boiling point, viscosity, bubbles produced | |
| B | Density, bubbles produced, tensile strength | |
| C | Bubbles produced, new substance formed, permanent colour change | |
| D | Heat capacity, density, expansion | |
| 4 The particle model is also known as: | | |
| A | Dalton’s theory. | |
| B | particle energy theory. | |
| C | the theory of matter and change. | |
| D | the kinetic theory of matter. | |

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| 5 What are the three states of matter? | |
| A | Freezing, melting and evaporating |
| B | Solid, liquid and gas |
| C | Elements, molecules and compounds |
| D | Solidification, condensation and freezing |

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|  | Section I  Total marks:  /5 marks |

Section II: Short-answer questions

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| 6 Draw diagrams in the boxes provided to show the particle arrangement of ice and water vapour. | | | | |
|  | Ice  Diagram should show particles of ice that are tightly packed, only vibrating on the spot (2 marks). | | | |
|  | Water vapour  Diagram should show particles of water vapour that are spread apart and free moving (2 marks). | | | |
|  | | | /4 marks | |
| 7 Write a definition for the term ‘viscosity’. | | | | |
| Viscosity refers to the thickness of a liquid and how easily particles can move around each other. For example, viscous liquids such as honey are difficult to pour. (1 mark). | | | | |
|  | | | /1 mark | |
| 8 Gases are able to be compressed, whereas both solids and liquids are incompressible. Explain why. | | | | |
|  | | | | |
| In gases, the particles are spread far apart and there are spaces between them (1 mark) that allows the particles to be ‘squeezed’ or compressed so they are more closely packed (1 mark). The particles of solids and liquids are already tightly packed, with no space between them so are unable to be compressed/incompressible (1 mark). | | | | |
|  | | | | /3 marks |
| 9 What is diffusion? Given an example. | | | | |
| Diffusion occurs when a substance spreads spontaneously through a liquid or gas (1 mark). Student examples will vary (1 mark). | | | | |
|  | | /2 marks | | |
|  | | Section II  Total marks:  /10 marks | | |

Section III: Extended-response questions

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| 10 Alexandra placed a beaker of ice on a bench. Every 30 minutes she measured the temperature of the ice water until the ice was completely melted.  Discuss why the liquid inside the thermometer will rise as the beaker of ice melts. | | |
|  | | |
| The heat from the melting ice is transferred to the liquid within the thermometer (1 mark). As the particles of the liquid are heated (1 mark), they gain more kinetic energy (1 mark). This causes them to move faster and spread further apart (1 mark), resulting in expansion (1 mark) and the liquid to rise up the tube within the thermometer. | | | | |
|  | | | | |
|  | /5 marks | | | |
| 11 Alexandra’s results from her experiment are shown in the table below.Graph her results. | | | |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Time (minutes) | 0 | 30 | 60 | 90 | 120 | 150 | 180 | | Temperature (°C) | 0 | 3 | 7 | 12 | 15 | 16 | 16 | | | | |
| Students’ answer will vary but should contain the following: title, even scales, labels and units, x points, line of best fit (1 mark each). | | | |
|  | | /5 marks | |
|  | | Section III  Total marks:  /10 marks | | |