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| 1. Which of the following would you classify as nano-scale?

|  |  |  |
| --- | --- | --- |
|   | a.  | An amoeba (a unicellular animal) |
|   | b.  | Grounded coffee |
|   | c.  | A water molecule |
|   | d.  | A cell membrane |
|   | e.  | An ore of gold |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- |
| The following information will be used to answer questions 2-6.A) B) C)D) E)  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 2. Which of the figures above depicts a gaseous element?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

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| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 3. Which of the figures above depicts a homogeneous mixture?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 4. Which of the figures above depicts a heterogeneous mixture?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 5. Which of the figures above depicts a liquid compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 6. Which of the figures above depicts a gaseous compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
| *PREFACE NAME:* | matter1 |
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| --- |
| The following information will be used to answer questions 7-12.**A)** **B)** **C)****D)** **E)** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 7. Which of the figures above represents a gaseous compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 8. Which of the figures above represents a liquid element?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 9. Which of the figures above represents a homogeneous mixture?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 10. Which of the figures above represents a gaseous element?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 11. Which of the figures above represents a liquid compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
| *PREFACE NAME:* | matter2 |
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| 12. Which of the following substances is an element?

|  |  |  |
| --- | --- | --- |
|   | a.  | F2 |
|   | b.  | C2H5OH |
|   | c.  | Sodium chloride |
|   | d.  | Water |
|   | e.  | Brass |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- |
| The following information will be used to answer question 13.

|  |  |  |
| --- | --- | --- |
| A) | B) | C) |
| D) | E) |   |

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| 13. Which of the figures above represents a mixture of two elements?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
| *PREFACE NAME:* | matter3 |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14. What kind of change is depicted below?

|  |  |  |
| --- | --- | --- |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|   | a.  | Chemical change |
|   | b.  | Physical change |
|   | c.  | Both chemical and physical change |
|   | d.  | No change |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. What kind of change is depicted below?

|  |  |  |
| --- | --- | --- |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|   | a.  | chemical change |
|   | b.  | physical change |
|   | c.  | both chemical and physical |
|   | d.  | no change |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 16. How many significant figures are there in the number 0.097?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 2 |
|   | c.  | 3 |
|   | d.  | 4 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 17. How many significant figures are there in the number 75100?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 2 |
|   | c.  | 3 |
|   | d.  | 4 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18. How many significant figures are there in the number 1.0720?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 2 |
|   | c.  | 3 |
|   | d.  | 4 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19. How many significant figures are there in the number 0.0306960?

|  |  |  |
| --- | --- | --- |
|   | a.  | 4 |
|   | b.  | 5 |
|   | c.  | 6 |
|   | d.  | 7 |
|   | e.  | 8 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20. Carry out the following calculation and report your answer to the correct number of significant figures:2.795 m × 3.10 m         6.48 m

|  |  |  |
| --- | --- | --- |
|   | a.  | 1.3 m |
|   | b.  | 1.34 m |
|   | c.  | 1.337 m |
|   | d.  | 1.3371 m |
|   | e.  | 1.37711 m |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 21. What is the best answer to report for (515 × 0.0025) + 24.57?

|  |  |  |
| --- | --- | --- |
|   | a.  | 25.858 |
|   | b.  | 25.86 |
|   | c.  | 25.8575 |
|   | d.  | 26 |
|   | e.  | 25.9 |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. Solve the following calculation and report your ans to the correct number of significant figures:

|  |  |  |
| --- | --- | --- |
|   | a.  | 8.64 |
|   | b.  | 2.44 x 109 |
|   | c.  | 2.44 x 10-7 |
|   | d.  | 1.79 x 10-15 |
|   | e.  | 1.06 x 10-19 |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 23. When 87.7 is added to 73.841, the result should be reported with \_\_\_\_\_ significant figures. And when 87.7 is divided by 73.841 the result should be reported with \_\_\_\_\_\_ significant figures.

|  |  |  |
| --- | --- | --- |
|   | a.  | 3, 3 |
|   | b.  | 3, 5 |
|   | c.  | 4, 3 |
|   | d.  | 4, 4 |
|   | e.  | 3, 4 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24. When 45.24 is subtracted from 40.1, the result should have \_\_\_\_\_ significant figures. When 45.24 is multiplied by 40.1, the result should have \_\_\_\_\_ significant figures.

|  |  |  |
| --- | --- | --- |
|   | a.  | 2 , 5 |
|   | b.  | 3 , 3 |
|   | c.  | 2 , 3 |
|   | d.  | 4 , 4 |
|   | e.  | 3 , 2 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 25. When 51.8 and 67.5 are multiplied, the product has \_\_\_\_ significant figures, and when 51.8 and 67.5 are added, the sum has \_\_\_\_ significant figures.

|  |  |  |
| --- | --- | --- |
|   | a.  | 5 , 3 |
|   | b.  | 3 , 4 |
|   | c.  | 3 , 5 |
|   | d.  | 4 , 3 |
|   | e.  | 3 , 3 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
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| 26. A quarter has a mass of 5.52 g. What is the mass of a quarter in milligrams?

|  |  |  |
| --- | --- | --- |
|   | a.  | 55.2 mg |
|   | b.  | 552 mg |
|   | c.  | 5520 mg |
|   | d.  | 0.0552 mg |
|   | e.  | 0.00552 mg |

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| *ANSWER:* | c |
| *POINTS:* | 1 |
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| 27. How many days are equivalent to 27360 minutes?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1.9 days |
|   | b.  | 6.8 days |
|   | c.  | 10.9 days |
|   | d.  | 17 days |
|   | e.  | 19.00 days |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
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| 28. How many centiliters are there in 250 liters?

|  |  |  |
| --- | --- | --- |
|   | a.  | 2.5 x 102 centiliters |
|   | b.  | 2.5 x 104 centiliters |
|   | c.  | 2.5 centiliters |
|   | d.  | 2.5 x 10−2 centiliters |
|   | e.  | 2.5 x 10−4 centiliters |

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| *ANSWER:* | b |
| *POINTS:* | 1 |
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| 29. How many milligrams are in 0.025 kilograms?

|  |  |  |
| --- | --- | --- |
|   | a.  | 25 mg |
|   | b.  | 250 mg |
|   | c.  | 2500 mg |
|   | d.  | 25000 mg |
|   | e.  | 250000 mg |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
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| 30. A wavelength of red light is measured at 655 nm. What is this measurement in centimeters?

|  |  |  |
| --- | --- | --- |
|   | a.  | 6.55 cm |
|   | b.  | 0.00655 cm |
|   | c.  | 6.55 x 10−5 cm |
|   | d.  | 6.55 x 10−7 cm |
|   | e.  | 6.55 x 10−9 cm |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 31. The wavelength of a beam of ultraviolet light is 247 nanometers (nm). What is the wavelength in meters?

|  |  |  |
| --- | --- | --- |
|   | a.  | 2.47 x 10−3 m |
|   | b.  | 2.47 x 10−5 m |
|   | c.  | 2.47 x 10−7 m |
|   | d.  | 2.47 x 10−9 m |
|   | e.  | 2.47 x 10−12 m |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 32. Which is higher: 144oF or 63.6oC? { oF = 9/5(oC) + 32 }

|  |  |  |
| --- | --- | --- |
|   | a.  | 144oF |
|   | b.  | 63.6oC |
|   | c.  | The temperatures are equivalent |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 33. The melting point of an unknown solid is determined to be 32.0oC. What is this temperature on the Kelvin scale? Report your answer to the correct number of significant figures.

|  |  |  |
| --- | --- | --- |
|   | a.  | 241.2 K |
|   | b.  | 241.15 K |
|   | c.  | 305 K |
|   | d.  | 305.2 K |
|   | e.  | 305.15 K |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 34. As part of the calibration of a new laboratory balance, the mass of a 0.200 g mass standard is determined with the following results:

|  |  |
| --- | --- |
|  **Trial** |  **Mass** |
|  1 |  0.216-g |
|  2 |  0.196-g |
|  3 |  0.187-g |

|  |  |  |
| --- | --- | --- |
|   | a.  | The balance is both accurate and precise. |
|   | b.  | The balance is accurate but imprecise. |
|   | c.  | The balance is precise but inaccurate. |
|   | d.  | The balance is both inaccurate and imprecise. |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 35. As part of the calibration of a new laboratory balance, the mass of a 0.200 g mass standard is determined with the following results:

|  |  |
| --- | --- |
| **Trial** |  **Mass** |
|  1 | 0.204 g |
|  2 | 0.207 g |
|  3 | 0.189 g |

​Which of the statements is true for the new balance?

|  |  |  |
| --- | --- | --- |
|   | a.  | The balance is both accurate and precise. |
|   | b.  | The balance is accurate but imprecise. |
|   | c.  | The balance is precise but inaccurate. |
|   | d.  | The balance is both inaccurate and imprecise. |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 36. The liquid 1,2-ethanedithiol is insoluble in water. If a 75.5-g sample of 1,2-ethanedithiol has a volume of 61.2 mL, what is its density, and would it float or sink if poured into a beaker containing water?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1.23 g/mL and it would sink in water |
|   | b.  | 1.23 g/mL and it would float on water |
|   | c.  | 0.811 g/mL and it would sink in water |
|   | d.  | 0.811 g/mL and it would float on water |

|  |  |
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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 37. An unknown solid was analyzed in order to ascertain its identity. The mass of the solid was found to be 385.8 g. When the solid was dropped into a graduated cylinder containing 45.5 mL of water, the water level rose to 65.2 mL. The most likely identity of the metal is:

|  |  |  |
| --- | --- | --- |
|   | a.  | Aluminum, d = 2.72 g/mL |
|   | b.  | Silver, d = 10.50 g/mL |
|   | c.  | Lead, d = 11.34 g/mL |
|   | d.  | Tungsten, d = 19.38 g/mL |
|   | e.  | Platinum, d = 21.46 g/mL |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 38. A general chemistry student found a chunk of metal in the basement of a friend's house. She measured the mass of the metal to be 383.6 g. Then she dropped the metal into a graduated cylinder containing 25.0 mL of water, and the water level rose to 43.0 mL. Of the following metals, which is the most likely:

|  |  |  |
| --- | --- | --- |
|   | a.  | Aluminum, d = 2.72 g/mL |
|   | b.  | Silver, d = 10.50 g/mL |
|   | c.  | Lead, d = 11.34 g/mL |
|   | d.  | Tungsten, d = 19.38 g/mL |
|   | e.  | Platinum, d = 21.46 g/mL |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 39. A general chemistry student found a chunk of metal in the basement of a friend's house. She measured the mass of the metal to be 238.7 g. Then she dropped the metal into a graduated cylinder containing 35.0 mL of water, and the water level rose to 47.3mL. Of the following metals, which one did she use?

|  |  |  |
| --- | --- | --- |
|   | a.  | Aluminum, d = 2.72 g/mL |
|   | b.  | Silver, d = 10.50 g/mL |
|   | c.  | Lead, d = 11.34 g/mL |
|   | d.  | Tungsten, d = 19.38 g/mL |
|   | e.  | Platinum, d = 21.46 g/mL |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
| *NOTES:* | this question is a dynamic form of question 39 |
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| 40. An empty Erlenmeyer flask weighs 241.3 g. When filled with water (density = 0.997 g/mL), the flask and its contents weigh 489.1 g. What volume of water does the flask hold?

|  |  |  |
| --- | --- | --- |
|   | a.  | 246. mL |
|   | b.  | 247. mL |
|   | c.  | 248. mL |
|   | d.  | 249. mL |
|   | e.  | 241. mL |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
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| 41. An empty Erlenmeyer flask weighs 230.59999999999999 g . When filled with ethyl alcohol (density = 0.789 g/mL), the flask and its contents weigh 585.20000000000005 g. What volume of ethyl alcohol does the flask hold?

|  |  |  |
| --- | --- | --- |
|   | a.  | 220.74594660000005 mL |
|   | b.  | 279.77940000000001 mL |
|   | c.  | 354.60000000000002 mL |
|   | d.  | 449.42965779467681 mL |
|   | e.  | 181.9434 mL |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 42. Which one of the following substances is classified as an element?

|  |  |  |
| --- | --- | --- |
|   | a.  | I2 |
|   | b.  | NO |
|   | c.  | KCl |
|   | d.  | C6H12O6 |
|   | e.  | CO |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
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| 43. Which one of the following substances is classified as a chemical compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | He |
|   | b.  | Nb |
|   | c.  | Na |
|   | d.  | NO |
|   | e.  | Co |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
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| 44. Which of the following is an example of a chemical change?

|  |  |  |
| --- | --- | --- |
|   | a.  | alcohol evaporating |
|   | b.  | water boiling |
|   | c.  | skin burning in the sun |
|   | d.  | iodine vaporizing |
|   | e.  | ice melting |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
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| 45. Which of the following is an example of a chemical change?

|  |  |  |
| --- | --- | --- |
|   | a.  | silver tarnishing |
|   | b.  | iodine sublimating |
|   | c.  | alcohol boiling |
|   | d.  | sucrose dissolving |
|   | e.  | sodium chloride melting |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 46. Which of the following is a mixture?

|  |  |  |
| --- | --- | --- |
|   | a.  | a homogeneous solution of sugar dissolved in water |
|   | b.  | bromine (a liquid with the formula Br2) |
|   | c.  | sucrose (table sugar: the formula is C12H22O11) |
|   | d.  | graphite (an allotrope of carbon) |
|   | e.  | calcium oxide (CaO or lime) |

|  |  |
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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 47. All of the following are examples of mixtures except

|  |  |  |
| --- | --- | --- |
|   | a.  | supermarket salt. |
|   | b.  | distilled water. |
|   | c.  | soft water. |
|   | d.  | hard water. |
|   | e.  | drugstore hydrogen peroxide. |

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| *ANSWER:* | b |
| *POINTS:* | 1 |
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| 48. All of the following are homogeneous mixtures except

|  |  |  |
| --- | --- | --- |
|   | a.  | sodium chloride and potassium chloride. |
|   | b.  | hydrogen gas and chlorine gas. |
|   | c.  | sodium chloride and potassium chloride solution. |
|   | d.  | mercury-zinc solution. |
|   | e.  | hydrochloric acid solution. |

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| 49. Express the number 0.000207 in scientific notation.

|  |  |  |
| --- | --- | --- |
|   | a.  | 207 × 10–6 |
|   | b.  | 2.07 × 102 |
|   | c.  | 2.07 × 104 |
|   | d.  | 2.07 × 10–4 |
|   | e.  | 0.207 × 10–3 |

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| *ANSWER:* | d |
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| 50. The melting point of a solid is 41°F. This corresponds to

|  |  |  |
| --- | --- | --- |
|   | a.  | 296 K. |
|   | b.  | 314 K. |
|   | c.  | 289 K. |
|   | d.  | 278 K. |
|   | e.  | 314 K. |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
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| 51. The melting point of a certain solid is -25 °C. This corresponds to

|  |  |  |
| --- | --- | --- |
|   | a.  | 12.6 °F. |
|   | b.  | -31.666666666666668 °F. |
|   | c.  | -13 °F. |
|   | d.  | -102.60000000000001 °F. |
|   | e.  | 18.111111111111111 °F. |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
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| 52. A piece of metal (mass = 17.675999999999998 g) is placed in 11 mL of chloroform (*d* = 1.498 g/mL) in a 25-mL graduated cylinder. The chloroform level increases to 15.46 mL. The best value for density of this metal from these data is

|  |  |  |
| --- | --- | --- |
|   | a.  | 1.1433376455368691 g/mL. |
|   | b.  | 2.6456800397540507 g/mL. |
|   | c.  | 3.9632286995515682 g/mL. |
|   | d.  | 5.9369165919282487 g/mL. |
|   | e.  | 3.9632286995515682 g/mL. |

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| *ANSWER:* | e |
| *POINTS:* | 1 |
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| 53. The number of significant figures in 3.3990 × 10–12 pm is

|  |  |  |
| --- | --- | --- |
|   | a.  | 5. |
|   | b.  | 6. |
|   | c.  | 3. |
|   | d.  | 7. |
|   | e.  | 4. |

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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 54. How many significant figures are there in the value 0.086249999999999993 m?

|  |  |  |
| --- | --- | --- |
|   | a.  | 4 |
|   | b.  | 3 |
|   | c.  | 2 |
|   | d.  | 5 |
|   | e.  | 6 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 55. How many significant figures are there in the measured value 69.379999999999995?

|  |  |  |
| --- | --- | --- |
|   | a.  | 2 |
|   | b.  | 3 |
|   | c.  | 6 |
|   | d.  | 5 |
|   | e.  | 4 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 56. What is the best answer to the following expression?(55.780000000000001 cm + 0.82899999999999996 cm + 4.6665999999999999 cm – 52.399999999999999 cm)

|  |  |  |
| --- | --- | --- |
|   | a.  | 8.8756000000000057 cm |
|   | b.  | 8.8756000000000057 cm |
|   | c.  | 8.8756000000000057 cm |
|   | d.  | 8.8756000000000057 cm |
|   | e.  | 8.8756000000000057 cm |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 57. What is the best answer to report for ?

|  |  |  |
| --- | --- | --- |
|   | a.  | 5.015 g/mL |
|   | b.  | 5.0154 g/mL |
|   | c.  | 5.0 g/mL |
|   | d.  | 5.02 g/mL |
|   | e.  | 5.01539 g/mL |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 58. How much feet (ft) is contained in 0.315 km, given that 1 mile = 1.609 km and 5280 ft = 1 mile (exact).

|  |  |  |
| --- | --- | --- |
|   | a.  | 1030 ft |
|   | b.  |  ft |
|   | c.  |  ft |
|   | d.  | 2670 ft |
|   | e.  |  ft |

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| *ANSWER:* | a |
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| *QUESTION TYPE:* | Multiple Choice |
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| 59. How many liters are in 99.2 fluid ounces of a soft drink? (1 fl oz = 28.35 mL)

|  |  |  |
| --- | --- | --- |
|   | a.  | 3.50 × 10–3 L |
|   | b.  | 3.50 × 103 L |
|   | c.  | 2.81 × 106 L |
|   | d.  | 2.81 × 103 L |
|   | e.  | 2.810 L |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 60. A 0.41199999999999998-kg sample of methylene chloride has a density of 1.326 g/cm3. Calculate its volume.

|  |  |  |
| --- | --- | --- |
|   | a.  | 3220 cm3 |
|   | b.  | 0.00031070889894419304 cm3 |
|   | c.  | 412 cm3 |
|   | d.  | 310.70889894419304 cm3 |
|   | e.  | 546.31200000000001 cm3 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| 61. The measurement 5.4 x 10-1 g also could be written as

|  |  |  |
| --- | --- | --- |
|   | a.  | 5.4 μg. |
|   | b.  | 5.4 mg. |
|   | c.  | 5.4 cg. |
|   | d.  | 5.4 kg. |
|   | e.  | 5.4 dg. |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 62. What is the correct answer to the expression below? =

|  |  |  |
| --- | --- | --- |
|   | a.  | 8.63 cm |
|   | b.  | 8.6369 cm |
|   | c.  | 8.6 cm |
|   | d.  | 8.636 cm |
|   | e.  | 8 cm |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 63. Which of the following is an example of a chemical change?

|  |  |  |
| --- | --- | --- |
|   | a.  | iron rusting |
|   | b.  | sodium chloride melting |
|   | c.  | ice melting |
|   | d.  | sucrose dissolving |
|   | e.  | water boiling |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 64. The element name and symbol is correctly matched for which of the following?

|  |  |  |
| --- | --- | --- |
|   | a.  | Mg -   manganese |
|   | b.  | Tn - tin |
|   | c.  | Fe - iron |
|   | d.  | P - potassium |
|   | e.  | C - copper |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 65. Gold bar is a(n)

|  |  |  |
| --- | --- | --- |
|   | a.  | compound. |
|   | b.  | element. |
|   | c.  | homogeneous mixture. |
|   | d.  | heterogeneous mixture. |
|   | e.  | gas. |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
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| 66. Which of the following is not the symbol of an element?

|  |  |  |
| --- | --- | --- |
|   | a.  | Cr |
|   | b.  | CO |
|   | c.  | Ca |
|   | d.  | C |
|   | e.  | Cd |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
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| 67. Bacteria, sugar molecules, and water droplets are matter at the:

|  |  |  |
| --- | --- | --- |
|   | a.  | microscale, nanoscale, macroscale. |
|   | b.  | macroscale, nanoscale, microscale. |
|   | c.  | microscale, macroscale, nanoscale. |
|   | d.  | nanoscale, microscale, macroscale. |
|   | e.  | none of these choices. |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 68. Three length scales ordered from smallest to largest are:

|  |  |  |
| --- | --- | --- |
|   | a.  | microscale, macroscale, nanoscale. |
|   | b.  | macroscale, nanoscale, microscale. |
|   | c.  | microscale, nanoscale, macroscale. |
|   | d.  | nanoscale, microscale, macroscale. |
|   | e.  | none of these choices. |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 69. Which of the following is not a physical property of water?

|  |  |  |
| --- | --- | --- |
|   | a.  | Water can be broken down into hydrogen gas and oxygen gas. |
|   | b.  | Water is a liquid at room temperature. |
|   | c.  | Water freezes at 32 °F. |
|   | d.  | Water boils at 100 °C. |
|   | e.  | Water is transparent to visible light. |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 70. Which of the following is a chemical property of iron?

|  |  |  |
| --- | --- | --- |
|   | a.  | Iron melts at 1535 °C. |
|   | b.  | Iron rusts on exposure to water and oxygen. |
|   | c.  | Iron can be bent into shapes. |
|   | d.  | Iron conducts electricity. |
|   | e.  | Iron conducts heat. |

|  |  |
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| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 71. Sugar, coffee, and bismuth are:

|  |  |  |
| --- | --- | --- |
|   | a.  | a pure substance, a heterogeneous mixture, and an element. |
|   | b.  | an element, a homogeneous mixture, and a pure substance. |
|   | c.  | a homogeneous mixture, a pure substance, and a homogeneous mixture. |
|   | d.  | an element, a pure substance, and a homogeneous mixture. |
|   | e.  | none of these choices. |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 72. Which metric prefix(es) listed below is(are) correctly assigned the proper power of ten?

|  |  |
| --- | --- |
| I. | giga: 109 |
| II. | micro: 106 |
| III. | nano: 10−12 |

|  |  |  |
| --- | --- | --- |
|   | a.  | I only |
|   | b.  | II only |
|   | c.  | III only |
|   | d.  | I and II |
|   | e.  | II and III |

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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 73. How would the measurement, 5125 m, be rounded off to three significant digits and expressed in scientific notation?

|  |  |  |
| --- | --- | --- |
|   | a.  | 5.12 × 10−3 m |
|   | b.  | 5.13 × 10−3 m |
|   | c.  | 5.130 × 10−3 m |
|   | d.  | 5.12 × 103 m |
|   | e.  | 5.13 × 104 m |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
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| 74. Three students measured the freezing temperature of water in the laboratory. Their results are as follows:

|  |  |
| --- | --- |
| Student 1: | freezing temperature = 2.86 °C |
| Student 2: | freezing temperature = −4.52 °C |
| Student 3: | freezing temperature = 3.21 °C |

The actual freezing temperature of water equals 0.00 °C. The results of these three students when compared to the true freezing temperature of water demonstrates:

|  |  |  |
| --- | --- | --- |
|   | a.  | High accuracy and high precision |
|   | b.  | High accuracy and low precision |
|   | c.  | Low accuracy and high precision |
|   | d.  | low accuracy and low precision |
|   | e.  | None of these |

|  |  |
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| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 75. What is the temperature given by the thermometer below written with the proper number of significant digits?

|  |  |  |
| --- | --- | --- |
|   | a.  | 32.3 °C |
|   | b.  | 32.30 °C |
|   | c.  | 32 °C |
|   | d.  | 32.300 °C |
|   | e.  | 30 °C |

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| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 76. The speed of light in a vacuum is 2.998 × 108 m/s. What is this speed given in cm/min?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1.799 × 1013 cm/min |
|   | b.  | 1.799 × 1012 cm/min |
|   | c.  | 4.997 × 108 cm/min |
|   | d.  | 1.799 × 108 cm/min |
|   | e.  | 4.997 × 104 cm/min |

|  |  |
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| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 77. What is the mass of 25.0 mL of an oil if its density is 0.843 g/mL?

|  |  |  |
| --- | --- | --- |
|   | a.  | 29.7 g |
|   | b.  | 21.1 g |
|   | c.  | 15.2 g |
|   | d.  | 38.4 g |
|   | e.  | 211 g |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 78. The diameter of a US Quarter is approximately 2.35 cm. What is the diameter of the quarter expressed in km and scientific notation?

|  |  |  |
| --- | --- | --- |
|   | a.  | 2.35 × 10−5 km |
|   | b.  | 2.35 × 105 km |
|   | c.  | 2.35 × 10−2 km |
|   | d.  | 23.5 × 10−4 km |
|   | e.  | 2.35 km |

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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| --- |
| The following information will be used to answer questions 2-6.A) B) C)D) E)  |

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| 79. Which of the figures above depicts a liquid compound?

|  |  |  |
| --- | --- | --- |
|   | a.  | A |
|   | b.  | B |
|   | c.  | C |
|   | d.  | D |
|   | e.  | E |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
| *PREFACE NAME:* | matter1 |
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| 80. How many of the following ions are named correctly?​Ca2+ - Calcium ionNi2+ - Nickel ionCu+ - Copper (I) ionCl- - Chlorine ion​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  | 1 |
|   | c.  | 2 |
|   | d.  | 3 |
|   | e.  | 4 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 81. What is the oxidation number of nitrogen in NO3?

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  | +3 |
|   | c.  | -3 |
|   | d.  | +6 |
|   | e.  | -6 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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| 82. What is the oxidation number of hydrogen in CaH2?

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  | +1 |
|   | c.  | +2 |
|   | d.  | -1 |
|   | e.  | +1 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | False |
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