Question #: 1

Write the number 0.00378 in scientific notation with the same number of significant figures. Use the format 2.22E2 or 2.22E-2 for answers in scientific notation.

1. __________

Question #: 2

Fill in the missing information for metric prefixes. Use the format 10^7 or 10^-7 to report the meaning of the prefix.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>milli</td>
<td><em>1</em></td>
<td><em>2</em></td>
</tr>
<tr>
<td><em>3</em></td>
<td>d</td>
<td><em>4</em></td>
</tr>
</tbody>
</table>

1. __________
2. __________
3. __________
4. __________

Question #: 3

The forecasted temperature in Lexington for today is 82°F. What is the corresponding temperature in °C?

A. 82°C
B. 90°C
C. 63°C
D. 28°C
Question #: 4

Which one would describe an archer's grouping as precise but not accurate?

A. A  
B. B  
C. C

Question #: 5

How many significant figures are in each value? Enter your answer as a whole number. Do NOT include units in your answer.

<table>
<thead>
<tr>
<th>Value</th>
<th>Significant Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.050</td>
<td>1</td>
</tr>
<tr>
<td>0.0235</td>
<td>2</td>
</tr>
</tbody>
</table>

1. __________
2. __________

Question #: 6

What is the result of the following calculation? Report your answer to the correct number of significant figures. Only answers with the correct number of significant figures will be accepted as correct.

\((8.9 + 3.98) \times 2.355 = 1\)

1. __________
**Question #**: 7

Convert 3.16 pounds to kilograms.

A. 0.38 kg  
B. 3.25 kg  
C. 6.84 kg  
D. 1.43 kg

---

**Question #**: 8

How many inches are in 35.40 meters?

A. 8992 inches  
B. 1394 inches  
C. 3540 inches  
D. 1445 inches

---

**Question #**: 9

Penicillin is prescribed to a 35-pound child at a dosage of 25 mg/kg body weight. What mass of medicine should the child receive? Report your answer to the nearest whole number.

A. 1925 mg  
B. 397 mg  
C. 636 mg  
D. 157 mg
Question #: 10

A piece of watermelon has a mass of 280 grams is 6.1% sugar by mass. How many grams of sugar are in the piece of watermelon?

A. 6.1 g  
B. 2.2 g  
C. 46 g  
D. 17 g

Question #: 11

A neutral atom of the radioisotope, zirconium-91 (\(^{91}\text{Zr}\)), has \(_1\) protons, \(_2\) neutrons, and \(_3\) electrons.

Do **NOT** include units in your answer.

1. \______________ 
2. \______________ 
3. \______________

Question #: 12

What is the average atomic mass for the element given the information below for its three naturally occurring isotopes?

<table>
<thead>
<tr>
<th>Isotope</th>
<th>Mass (amu)</th>
<th>Natural Abundance</th>
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<tbody>
<tr>
<td>1</td>
<td>23.985</td>
<td>78.99%</td>
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<tr>
<td>2</td>
<td>24.986</td>
<td>10.00%</td>
</tr>
<tr>
<td>3</td>
<td>25.983</td>
<td>11.01%</td>
</tr>
</tbody>
</table>

A. 25.33 amu  
B. 24.31 amu  
C. 22.36 amu  
D. 27.08 amu
Question #: 13

Which two correctly pair the substance with its description?

A. N₂, molecular compound
B. Ar, molecular element
C. KCl, ionic compound
D. N₂O₅, ionic compound
E. O₂, molecular element
F. NH₃, ionic compound

Question #: 14

What is the result of the following calculation? Report your answer to the correct number of significant figures. Only answers with the correct number of significant figures will be accepted.

\[0.0263 \times 5.241 = \_1\]

1. \_1

Question #: 15

Fill in the missing element symbol or name.

<table>
<thead>
<tr>
<th>Element Symbol</th>
<th>Element Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>lead</td>
</tr>
<tr>
<td>2</td>
<td>argon</td>
</tr>
<tr>
<td>Na</td>
<td>3</td>
</tr>
<tr>
<td>Ba</td>
<td>4</td>
</tr>
</tbody>
</table>

1. \_1
2. \_2
3. \_3
4. \_4
Question #: 16

Identify the **two** nonmetals.

A. Li  
B. O  
C. Cs  
D. Xe

---

Question #: 17

Which equality is **true**?

A. $6.022 \times 10^{23}$ mole = 1 atom  
B. 1 mole of $\text{H}_2\text{O} = 6.022 \times 10^{23}$ atoms  
C. 1 gram of carbon = $6.022 \times 10^{23}$ atoms  
D. 1 mole of sodium = $6.022 \times 10^{23}$ atoms

---

Question #: 18

In one formula unit of $\text{Ca}_3(\text{BO}_3)_2$, there are **_1_** Ca atom(s), **_2_** B atom(s), and **_3_** O atom(s).

1. __________
2. __________
3. __________
Question #: 19

Calculate the molar mass of Na₂CO₃.
Molar mass = \( \frac{1}{\text{mol}} \) g/mol.
Report your answer with three significant figures. Do NOT include units in your answer.

1. __________

Question #: 20

How many moles of NaCl are present in 22.5 g sample?

A. 2.60 mol
B. 1.32 mol
C. 0.760 mol
D. 0.385 mol

Question #: 21

How many Mg atoms are in 35 grams of Mg?
\( \frac{1}{\text{at}} \times 10^{-2} \) atoms
Report your answers with two significant digits.

1. __________
2. __________
Question #: 22

What is the electron arrangement for a neutral oxygen atom?
Number of electrons in \( n = 1 \) level is \( 1 \)
Number of electrons in \( n = 2 \) level is \( 2 \)
Number of electrons in \( n = 3 \) level is \( 3 \)
The number of \textbf{valence} electrons is \( 4 \).

1. __________
2. __________
3. __________
4. __________

Question #: 23

What is the most common ion formed from aluminum? Include \textbf{both} a \textbf{sign} (+ or −) and a \textbf{number} in your answer. \( 1 \)
The ion forms from the \( 2 \) [gain, loss] of \( 3 \) [protons, neutrons, electrons]

1. __________
2. __________
3. __________

Question #: 24

What is the formula of the most common compound formed between sodium and sulfur?

A. NaS  
B. NaS\(_2\)  
C. Na\(_2\)S  
D. Na\(_2\)S\(_2\)
Question #: 25

Which statement is true?

A. An ionic bond forms between a metal and a nonmetal, resulting from the transfer of electrons.
B. An ionic bond forms between two nonmetals, resulting from the sharing of electrons.
C. An ionic bond forms between two nonmetals, resulting from the transfer of electrons.
D. An ionic bond occurs between a metal and a nonmetal, resulting from the sharing of electrons.

Question #: 26

Add the prefixes to complete the name of the compound with the formula, Si₃N₄. Enter only prefixes for each answer.

1. silicon
2. nitride

1. __________
2. __________

Question #: 27

What is the name of an alkane with five carbon atoms? __1__
What is the name of an alkane with two carbon atoms? __2__

1. __________
2. __________
Choose the cyclohexane.

A.

B.

C.

D.
Question #: 1

Write the number 0.00378 in scientific notation with the same number of significant figures. Use the format 2.22E2 or 2.22E-2 for answers in scientific notation.

1. 3.78E-3

Question #: 2

Fill in the missing information for metric prefixes. Use the format 10^7 or 10^-7 to report the meaning of the prefix.

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How many significant figures are in each value?

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1. 30.3

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A neutral atom of the radioisotope, zirconium-91 (91Zr), has ___ protons, ___ neutrons, and ___ electrons.

Do NOT include units in your answer.

1. 40
2. 51
3. 40

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What is the average atomic mass for the element given the information below for its three naturally occurring isotopes?

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✓C. KCl, ionic compound  
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✓E. O$_2$, molecular element  
F. NH$_3$, ionic compound

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What is the result of the following calculation?
Report your answer to the correct number of significant figures. Only answers with the correct number of significant figures will be accepted.

\[
\frac{0.0263 \times 5.241}{1} = \]

1. .138|0.138|.137|0.137|
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Fill in the missing element symbol or name.

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1. Pb
2. Ar
3. sodium
4. barium

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Identify the two nonmetals.

A. Li
B. O ✓
C. Cs
D. Xe ✓

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Which equality is true?

A. \(6.022 \times 10^{23} \text{ mole} = 1 \text{ atom}\)
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C. 1 gram of carbon = \(6.022 \times 10^{23}\) atoms
D. 1 mole of sodium = \(6.022 \times 10^{23}\) atoms ✓
Question #: 18

In one formula unit of $\text{Ca}_3(\text{BO}_3)_2$, there are ___ Ca atom(s), ___ B atom(s), and ___ O atom(s).

1. 3\[three\]
2. 2\[two\]
3. 6\[six\]

Question #: 19

Calculate the molar mass of $\text{Na}_2\text{CO}_3$.

Molar mass = ___ g/mol.

Report your answer with \textbf{three} significant figures. Do \textbf{NOT} include units in your answer.

1. 106

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How many moles of $\text{NaCl}$ are present in 22.5 g sample?

A. 2.60 mol  
B. 1.32 mol  
C. 0.760 mol  
D. 0.385 mol

✓ D. 0.385 mol

Question #: 21

How many $\text{Mg}$ atoms are in 35 grams of $\text{Mg}$?

___ $\times 10^{2}$ atoms

Report your answers with \textbf{two} significant digits.

1. 8.7  
2. 23
Question #: 22

What is the electron arrangement for a neutral oxygen atom?
Number of electrons in \( n = 1 \) level is \( 1 \)
Number of electrons in \( n = 2 \) level is \( 2 \)
Number of electrons in \( n = 3 \) level is \( 3 \)
The number of valence electrons is \( 4 \).

1. \( 2 \) [two]
2. \( 6 \) [six]
3. \( 0 \) [zero]
4. \( 6 \) [six]

Question #: 23

What is the most common ion formed from aluminum? Include both a sign (+ or –) and a number in your answer.

The ion forms from the ___ [gain, loss] of ___ [protons, neutrons, electrons]

1. \( 3+ \) [+3]
2. loss [lose]
3. electrons

Question #: 24

What is the formula of the most common compound formed between sodium and sulfur?

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D. An ionic bond occurs between a metal and a nonmetal, resulting from the sharing of electrons.

---

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Add the **prefixes** to complete the name of the compound with the formula, Si\(_3\)N\(_4\). Enter only **prefixes** for each answer.

1. silicon
2. nitride

1. tri
2. tetra

---

**Question #: 27**

What is the name of an alkane with five carbon atoms? **1**

What is the name of an alkane with two carbon atoms? **2**

1. pentane
2. ethane

---

**Question #: 28**

Choose the cyclohexane.

A.
✓ B.

C.

D.