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| 1). | Find the volume of an object that has a density of 3.14 g/mL and a mass of 71.5 g. |
| A) | 22.8 mL |
| B) | 4.39 x 10–2 mL |
| C) | 225 mL |
| D) | 2.28 x 10–2 mL |

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| 2) | Which of the following involves no chemical change? |
| A) | burning paper |
| B) | boiling water |
| C) | baking a cake |
| D) | lighting a match |

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| 3) | How many protons, electrons, and neutrons, respectively, does have? |
| A) | 53, 127, 74 |
| B) | 53, 53, 127 |
| C) | 74, 53, 127 |
| D) | 53, 53, 74 |

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| 4) | Perform the following conversion: 5.80 m/s = \_\_\_\_\_\_\_\_\_\_ mi/h |
| A) | 0.386 mi/h |
| B) | 13.0 mi/h |
| C) | 277. mi/h |
| D) | 216. mi/h |

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| 5) | A *d* sublevel can hold a maximum of |
| A) | 5 electrons |
| B) | 10 electrons |
| C) | 14 electrons |
| D) | 32 electrons |

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| 6) | Which electron configuration indicates a transitional element? |
| A) | 1*s*22*s*22*p*63*s*13*p*6 |
| B) | 1*s*22*s*22*p*63*s*23*p*64*s*23*d*3 |
| C) | 1*s*22*s*22*p*5 |
| D) | 1*s*22*s*22*p*63*s*23*p*64*s*23*d*104*p*2 |

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| 7) | When an electron in the ground state absorbs energy, it goes to a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ state. |
| A) | excited |
| B) | lower |
| C) | frenetic |
| D) | ionic |

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| 8). | Thorium-234 undergoes beta particle production. What is the other product? |
| A) |  |
| B) |  |
| C) |  |
| D) |  |

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| 9) | A particular radioactive element has a half-life of 8.53 days. What percent of the original sample is left after 15.0 days? |
| A) | 54.4% |
| B) | 14.8% |
| C) | 59.1% |
| D) | 29.6% |

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| 10) | Rank the following from **smallest to largest** atomic radius. |
| A) | O, Zn, Ca, Ba |
| B) | O, Ca, Zn, Ba |
| C) | Ba, Ca, Zn, O |
| D) | O, Zn, Ba, Ca |

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| 11) | The name of the ClO2- ion is |
| A) | chlorite |
| B) | chloride |
| C) | hypochlorate |
| D) | perchlorate |

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| 12) | Which of the following compounds contains one or more covalent bonds? |
| A) | NaCl |
| B) | CaO |
| C) | CO2 |
| D) | Cs2O |

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| 13) | The correct name for FeO is |
| A) | iron oxide |
| B) | iron(II) oxide |
| C) | iron monoxide |
| D) | iron(I) oxide |

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| 14) | The Lewis structure for which of the following contains the greatest number of lone pairs of electrons? |
| A) | CH4 |
| B) | HF |
| C) | F2 |
| D) | H2O |

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| 15) | The boiling point of CH4 is much lower than that of HF. This is because: |
| A) | of London forces in CH4 |
| B) | of Hydrogen bonding in HF |
| C) | of Dipole-Dipole interactions in CH4 |
| D) | CH4 is polar |
| E) | HF is heavier |

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| 16) | Which of the following is the formula for aluminum oxide? |
| A) | AlO |
| B) | AlO2 |
| C) | AlO3 |
| D) | Al3O2 |
| E) | Al2O3 |

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| 17) | Choose the correct energy level diagram for the ground state of oxygen. |
| A) |  |
| B) |  |
| C) |  |
| D) |  |
| E) |  |

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| 18) | Which is an isotope of Iodine? |
| A) | 53 protons, 53 electrons, 74 neutrons |
| B) | 50 protons, 53 electrons, 77 neutrons |
| C) | 53 protons, 53 electrons, 77 neutrons |
| D) | 53 protons, 50 electrons, 127 neutrons |
| E) | 50 protons, 50 electrons, 127 neutrons |

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| 19) | 2.5 kilogram(s) contains this many grams: |
| A) | 2.5 x 102 |
| B) | 2.5 x 103 |
| C) | 25 |
| D) | 0.25 |
| E) | 2.5 x 10-3 |

20) Express 9230000 in scientific notation

A) 923 x 102

B) 9.23 x 106

C) 9.23 x 10-6

D) 92.3 x 108

21) Which metric prefix is used to designate 100?

A) H

B) m

C) B

D) c

E) d

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| 22) | Which of the following would be expected to be the strongest? |
| A) | Ionic |
| B) | Covalent |
| C) | Network covalent |
| D) | Hydrogen bonding |
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| 23) | Which of the following is an intramolecular force? |
| A) | Ionic |
| B) | Hydrogen bond |
| C) | London Force |
| D) | Polarity |
|  |  |
| 24) | Which of the following is a polar molecule? |
| A) | CO2 |
| B) | SiCl4 |
| C) | CaBr2 |
| D) | CH3OH |
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| 25) | Alpha particles are |
| A) | electrons |
| B) | protons |
| C) | neutrons |
| D) | helium nuclei |
| E) | X rays |
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| 26) | Which of the following elements is an alkaline earth metal? |
| A) | Ca |
| B) | Cu |
| C) | Fe |
| D) | Na |

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| 27) | Which of the following would hydrogen bond? |
| A) | CH2O |
| B) | CH4 |
| C) | CH3OH |
| D) | C2H5Br |