CHM 1020 FALL 2011 EXAM #1

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| 1) | Who is generally considered to be the founder of the atomic theory of matter? |  |

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|  | A)  Antoine Lavoisier |
|  | B)  Robert Boyle |
|  | C)  Aristotle |
|  | D)  John Dalton |
|  | E)  none of the above |

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| |  |  |  | | --- | --- | --- | | 2) | What is the term for the gravitational force of attraction between an object and Earth? |  |  |  |  | | --- | --- | |  | A)  volume | |  | B)  weight | |  | C)  mass | |  | D)  length | |  | E)  none of the above | | 3) | | Round off the following measurement to three significant digits: 14,546 cm. |  |  |  |  | | --- | --- | |  | A)  14,600 cm | |  | B)  15,000 cm | |  | C)  145 cm | |  | D)  146 cm | |  | E)  14,500 cm | |  |  |  |  |  |  | | --- | --- | --- | | 4) | Divide 6.41 × 10-3 by 8.04 × 107 and express the answer in scientific notation. |  |  |  |  |  | | --- | --- | --- | |  | | A)  7.97 × 10-12 | |  | | B)  7.97 × 105 | |  | | C)  7.97 × 10-10 | |  | | D)  7.97 × 103 | |  | | E)  7.97 × 10-11 | |  | |  | | 5) | | If a computer chip switches off-on-off in 0.015 μs, what is the switching time in ns? | | |  |  |  |  | | --- | --- | |  | A)  0.000 000 015 ns | |  | B)  15,000 ns | |  | C)  0.000 015 ns | |  | D)  15 ns | |  | E)  none of the above | |  |  | |  |  |  |  |  |  | | --- | --- | --- | | 6) | If a chemistry student weighs 155 lb, what is the mass in kilograms? (1lb = 454g) |  |  |  |  | | --- | --- | |  | A)  0.394 kg | |  | B)  70,400 kg | |  | C)  341 kg | |  | D)  70.4 kg | |  | E)  0.341 kg |  |  |  |  | | --- | --- | --- | | 7) | What is the term for a pure substance that can be broken down into two or more substances by chemical reaction? |  |  |  |  | | --- | --- | |  | A)  matter | |  | B)  compound | |  | C)  homogeneous | |  | D)  element | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 8) | What is the term for a direct change of state from a gas to a solid? |  |  |  |  | | --- | --- | |  | A)  sublimation | |  | B)  vaporization | |  | C)  deposition | |  | D)  condensation | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 9) | What is the term for the property of a metal to be drawn into a wire? |  |  |  |  | | --- | --- | |  | A)  alloy | |  | B)  tensile | |  | C)  ductile | |  | D)  malleable | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 10) | Which of the following laws states that mass cannot be created or destroyed? |  |  |  |  | | --- | --- | |  | A)  law of conservation of energy | |  | B)  law of conservation of mass | |  | C)  law of definite composition | |  | D)  law of conservation of mass and energy | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 11) | What is the term for an element that is generally shiny, has a high density and high melting point, and is a good conductor of heat and electricity? |  |  |  |  | | --- | --- | |  | A)  nonmetal | |  | B)  semimetal | |  | C)  metal | |  | D)  all of the above | |  | E)  none of the above | |  |  |  |  |  |  | | --- | --- | --- | | 12) | What is the term for a direct change of state from a solid to a gas? |  |  |  |  | | --- | --- | |  | A)  condensation | |  | B)  vaporization | |  | C)  deposition | |  | D)  sublimation | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 13) | Which of the following describes a substance in the gaseous physical state? |  |  |  |  | | --- | --- | |  | A)  The substance has a variable volume. | |  | B)  The substance has a variable shape. | |  | C)  The substance compresses significantly. | |  | D)  all of the above | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 14) | Which of the following chemical elements corresponds to the symbol Fe? |  |  |  |  | | --- | --- | |  | A)  manganese | |  | B)  fluorine | |  | C)  fermium | |  | D)  iron | |  | E)  none of the above |  |  |  |  | | --- | --- | --- | | 15) | If 0.230 g of sodium metal reacts with 0.355 g of chlorine gas, what is the mass of sodium chloride produced? |  |  |  |  | | --- | --- | |  | A)  0.125 g | |  | B)  0.230 g | |  | C)  0.585 g | |  | D)  0.355 g | |  | E)  impossible to predict from the given information | |  |  |   16) Which of the following subatomic particles are found inside the nucleus?  A) proton and electron  B) neutron and proton  C) electron and neutron  D) all of the above  E) none of the above  17) Using atomic notation, indicate the isotope having 26 p+, 32 n0, and 26 e-.  A) S B) S C) Fe D) Fe E) Fe  18) Which of the following scientists is credited with first arranging the elements into groups according to increasing atomic mass and repeating properties?  A) J. A. R. Newlands  B) Johann Döbereiner  C) Dmitri Mendeleev  D) H. G. J. Moseley  E) none of the above  19) Which of the following is a transition element?  A) Au  B) Cu  C) Ag  D) all of the above  E) none of the above  20) Which of the following is a halogen?  A) F  B) Cl  C) I  D) all of the above  E) none of the above |  |

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| 21) | If a patient is injected with 375 milliliters of IV glucose, what is the volume in fluid ounces? (Given: 1 fluid ounce = 29.6 milliliters) |  |

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|  | A)  0.0789 fluid ounces |
|  | B)  375 fluid ounces |
|  | C)  29.6 fluid ounces |
|  | D)  12.7 fluid ounces |
|  | E)  11,100 fluid ounces |

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| 22) | Refer to a periodic table and predict which of the following is a liquid metal at 25 °C and one atmosphere pressure. |  |

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|  | A)  Cl |
|  | B)  As |
|  | C)  Xe |
|  | D)  Br |
|  | E)  Hg |

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| 23) | A glass cylinder contains four liquid layers: mercury (*d* = 13.6 g/mL), chloroform (*d* = 1.49 g/mL), water (*d* = 1.00 g/mL), and ether (*d* = 0.708 g/mL). If an ice cube (*d* = 0.92 g/mL) is dropped into the cylinder, where does it come to rest? |  |

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|  | A)  on top of the ether layer |
|  | B)  on top of the water layer |
|  | C)  on top of the chloroform layer |
|  | D)  on top of the mercury layer |
|  | E)  on the bottom of the cylinder |

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| 24) | What are the freezing point and boiling point of water on the Kelvin scale? |  |

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|  | A)  0 K and 273 K |
|  | B)  100 K and 273 K |
|  | C)  100 K and 373 K |
|  | D)  0 K and 100 K |
|  | E)  273 K and 373 K |

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| 25) | Which of the following is an example of a physical property? |  |

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|  | A)  melting point |
|  | B)  crystalline form |
|  | C)  color |
|  | D)  physical state |
|  | E)  all of the above |

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| 26) | Which of the following properties of ethyl alcohol is a chemical property? |  |

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|  | | A)  ethyl alcohol in animals causes intoxication |
|  | | B)  ethyl alcohol and formic acid produce rum flavor |
|  | | C)  ethyl alcohol and sulfuric acid produce ethyl ether |
|  | | D)  ethyl alcohol and sodium metal release a gas |
|  | | E)  all of the above |
| 27) | What happens to the kinetic energy of a molecule when a gas is heated? | |  |

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|  | A)  Kinetic energy remains constant. |
|  | B)  Kinetic energy decreases. |
|  | C)  Kinetic energy increases. |
|  | D)  depends on the gas |
|  | E)  none of the above |

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| 28) | Match the following: | |
| A) | Rutherford 1) Discovered the electron |
| B) | Thomson 2) Founder of the Periodic Table |
| C) | Mendeleev 3) Discovered the nucleus on an atom |
| D) | Dalton 4) Atomic theory of matter |

29) Which element has the following electron configuration: 1*s*2 2*s*2 2*p*6 3*s*2 3*p*6 4*s*2 3*d*10 4*p*6 5*s*2 4*d*10 5*p*2?

A) Sr

B) Hf

C) Zr

D) Sn

E) none of the above

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| 30) | Which of the following is a representation of a d orbital? | |
| A) |  |
| B) |  |
| C) |  |
| D) |  |
| E) |  |

31) What is the maximum number of electrons that can occupy a *d* energy sublevel?

A) 2

B) 6

C) 10

D) 14

E) none of the above

32) Which element has the following electron configuration: [Ar] 4*s*2 3*d*5?

A) Cl B) Mn C) Tc D) Br E) Kr

33) Which of the following is *not* an observed property of gases?

A) Gases expand and fill the container.

B) Gases vary in shape and volume.

C) Gases compress and liquefy.

D) Gases diffuse uniformly.

E) Gases mix completely.





