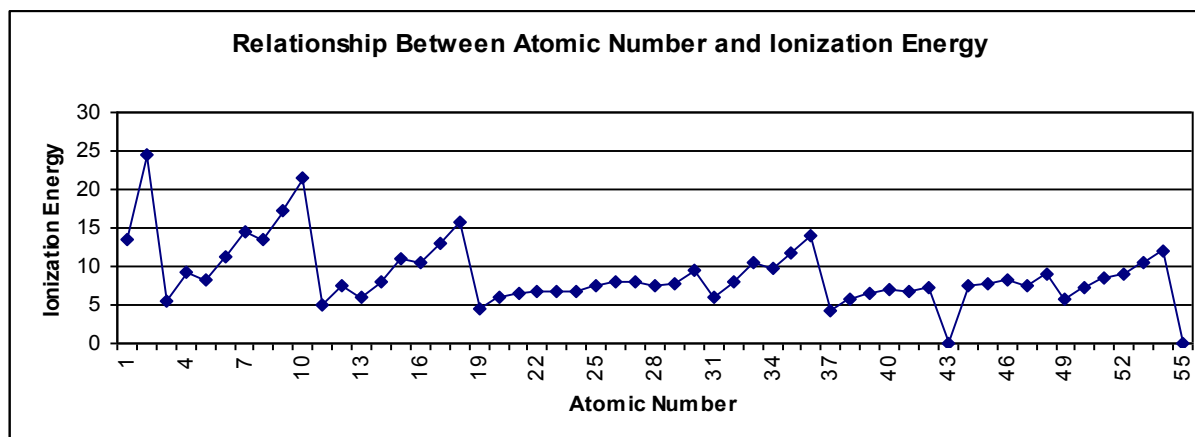


I. Multiple Choice

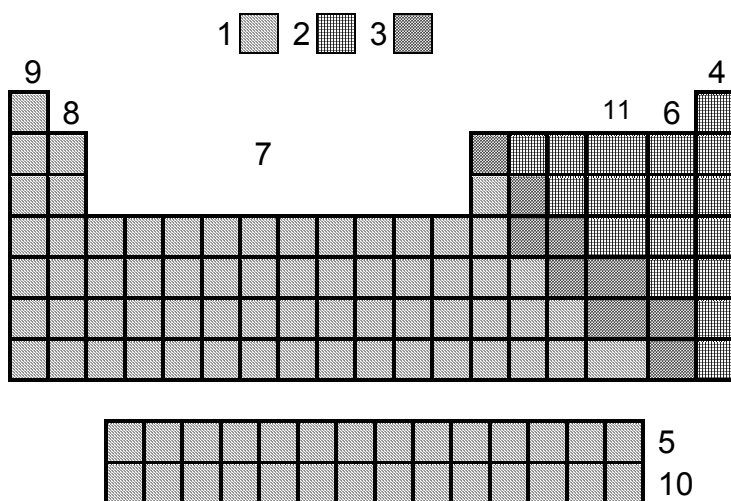
- In the modern periodic table, elements are ordered
 - according to decreasing atomic mass
 - according to Mendeleev's original design
 - according to increasing atomic number
 - based on when they were discovered
- The electron configuration of krypton _____ based on its position on the periodic table.
 - shows a single electron in the highest energy level
 - shows full *s* and *p* orbitals in the highest principal energy level
 - indicates a high level of reactivity
 - fully explains the increasing atomic mass within the group.
- Beryllium and calcium are _____ based on their position on the periodic table.
 - less reactive than lithium and potassium
 - less reactive than neon and krypton
 - less dense than lithium and sodium
 - have the same electron configurations as chlorine and bromine
- Lithium and potassium are _____ based on their positions on the periodic table.
 - alkali metals
 - transition metals
 - halogens
 - noble gases
- Fluorine and chlorine are _____ based on their positions on the periodic table.
 - alkaline-earth metals
 - transition elements actinides
 - halogens
 - noble gases
- As you move down the periodic table in a family, atomic radii
 - generally increase
 - do not change
 - generally decrease
 - vary unpredictably
- As you move left to right in a period, atomic radii
 - generally increase
 - do not change
 - generally decrease
 - vary unpredictably
- The energy it takes to attract an electron from an atom _____ as you move across a period.
 - generally increases
 - does not change
 - generally decreases
 - varies unpredictably
- Which element has the abbreviated electron configuration, $[\text{Ar}] 4s^2, 3d^{10}, 4p^6$?
 - Krypton
 - Xenon
 - Zinc
 - Lead
- Which element has the abbreviated electron configuration, $[\text{Rn}] 7s^2, 5f^{14}, 6d^1$?
 - Actinium
 - Rutherfordium
 - Lawrencium
 - Lutetium
- Cesium has the abbreviated electron configuration,
 - $[\text{I}] 5p^6, 6s^1$
 - $[\text{Rn}] 7s^1$
 - $[\text{Cs}]$
 - $[\text{Xe}] 6s^1$

Use the diagram to answer questions 12-15.



12. Which general trend exists for ionization energy across a period?
 A) Ionization energy increases
 B) Ionization energy decreases
 C) Ionization remains fairly constant.
 D) Ionization energy first increases then decreases
13. What general trend exists for ionization energy down a family?
 A) Ionization energy increases
 B) Ionization energy decreases
 C) Ionization remains fairly constant.
 D) Ionization energy first increases then decreases
14. Which group tends to have the highest ionization energy? The lowest?
 A) halogens; alkaline earth metals
 B) alkaline earth metals; halogens
 C) alkali metals; noble gases
 D) noble gases; alkali metals
15. Magnesium has a higher ionization energy than aluminum because
 A) magnesium is a smaller atom.
 B) magnesium is in the 3rd energy level.
 C) magnesium has a filled s orbital
 D) Al is a metalloid.
16. Fluorine has a higher ionization energy than chlorine because
 A) fluorine is a halogen
 B) fluorine is smaller than chlorine
 C) fluorine needs to gain one electron
 D) chlorine has less protons than fluorine
17. Which of the following statements regarding ionization energy is true?
 A) Periodic trends in ionization energies are opposite those for atomic size.
 B) Periodic trends in ionization energies are opposite those for electronegativity.
 C) Periodic trends in ionization energies are opposite those for electron affinity.
 D) none of the above

Use the diagram below to answer questions 18-25.



18. In which family are all the elements chemically unreactive?
 a. 1 b. 2 c. 3 d. 4 e. 1 & 2
19. In which region are the elements that do not conduct electricity?
 a. 1 b. 2 c. 3 d. 4 e. 1 & 2
20. Which region are the metalloids?
 a. 1 b. 2 c. 3 d. 4 e. 1 & 2
21. In which region are the nonmetals?
 a. 1 b. 2 c. 3 d. 4
22. The metals are in which region?
 a. 1 b. 2 c. 3 d. 4
23. Which family has the most reactive metals?
 a. 4 b. 5 c. 8 d. 9

24. The transition metals are
 a. 3 b. 7 c. 8 d. 9
25. The lanthanide series is
 a. 4 b. 2 c. 9 d. 10
26. Mendeleev received more credit for creating the period table than Meyer because Mendeleev
 a. used atomic numbers c. left spaces for undiscovered elements
 b. organized elements into triads d. had a better publicist
27. The contribution made by the Newlands' law of octaves to the development of the periodic table was
 a. the idea of atomic mass c. use of atomic number
 b. the use of repeating properties d. the introduction of periods and families
28. The elements in the modern periodic table are arranged by increasing
 a. density b. size c. atomic mass d. activity e. atomic number
29. Elements in the same family have similar chemical properties because
 a. they have the similar atomic masses
 b. their electron arrangement is similar
 c. they are the same size
 d. none of these
30. Which of the following is **not** a property of a metal?
 a. they react with acids c. they are malleable
 b. they conduct electricity d. they form negative ions
31. The repetition of similar properties at regular intervals when elements are arranged by increasing atomic number is known as
 a. Mendeleev's Rule c. Avogadro's Law
 b. Law of Conservation of Mass d. periodic law
32. Which element has properties that most resemble argon?
 a. oxygen b. barium c. iodine d. zinc e. none of these

For questions 33-36, classify each substance in the data table as

(A) metal **(B)** nonmetal **(C)** metalloid

Element	Malleable or brittle	Luster	Conductor	Reacts with acid	Metal, nonmetal, or metalloid?
J	malleable	dull	yes	no	33
Q	brittle/yellow	dull	no	no	34
Y	malleable/grey	shiny	yes	yes	35
Z	brittle/grey	shiny	yes	no	36

Match the element to the description in questions 36-42.

- | | |
|--|--------------|
| 37. alkaline earth metal | a. silver |
| 38. alkali metal | b. magnesium |
| 39. noble gases | c. chlorine |
| 40. halogens | d. sodium |
| 41. transition metal | e. neon |
| 42. a highly reactive, greenish-yellow gas used as a bleach and water disinfectant | |
| 43. best conductor of heat and electricity. | |
| 44. has a completely filled outer energy level | |
| 45. used in advertising signs | |
| 46. forms table salt when combined with chlorine | |
| 47. used for coins, fine eating utensils and jewelry | |
| 48. has 1 valence electron | |
| 49. unreactive | |
| 50. has 2 valence electrons | |

Name _____ Period _____

II. Short answers. Use complete sentences.

17) In terms of **electrons** and **atomic structure**, account for what happens to atomic radii

A) as you move down a group?

B) across a period?

19) In terms of **electron configuration** and **reactivity**, how do the alkali metals compare to the alkaline-earth metals?

21) a. Write the noble gas (abbreviated) electron configurations for these elements.

b. Write the electron dot diagram.

A. sodium

B. silver

C. mercury