





37. How many atoms are represented by 85.37 g Ca?

\_\_\_\_\_

**Electron Configuration:** Write electron configuration notation for the following elements (3 pts ea).

38. Fluorine, atomic number 9 \_\_\_\_\_

39. Calcium, atomic number 20 \_\_\_\_\_

**Matching:** Write the letter of the family in the second column that matches the description in the first column (2 points each).

- |           |   |    |                       |
|-----------|---|----|-----------------------|
| _____ 40. | contain a pair of electrons in the outermost s sublevel and no p electrons in the outermost level | a. | alkali metals         |
| _____ 41. | very reactive elements that combine with metals to form salts                                     | b. | halogens              |
| _____ 42. | have a full valence shell   | c. | alkaline-earth metals |
| _____ 43. | represent filling of 5f sublevel, all radioactive   | d. | actinides             |
| _____ 44. | react violently with water to form bases  | e. | noble gases           |

**Essay Questions:** Answer the question with four or more complete sentences (10 points each).

45. What are the properties of alkali metals? What Group are they in? Why?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

46. List and explain four properties of metals? Where are they located? Do they give up or take electrons?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Test 3B (145 Points)**  
**Electrons, Quantum Numbers and the Periodic Table****Multiple Choice:** Read the question carefully. There is only one correct answer (3 points each).

- The \_\_\_\_\_ are elements with atomic numbers from 90 to 103 on the Periodic Table.
  - lanthanides
  - noble gases
  - actinides
  - alkali metals
- The discovery of the noble gases changed the periodic table by adding a new \_\_\_\_\_.
  - period
  - series
  - group
  - sublevel block
- The most characteristic property of the halogens is that they are \_\_\_\_\_.
  - very reactive
  - all radioactive
  - metalloids
  - largely unreactive
- Anything that has mass and occupies space is called \_\_\_\_\_.
  - an atom
  - matter
  - mixtures
  - substance
- The simplest pure substances that cannot be broken down into any simpler substances by heating or chemical reactions are called \_\_\_\_\_.
  - compounds.
  - molecules.
  - elements.
  - bonds.
- Bromine has an atomic number of 35 and an atomic mass of 79.904 u. How many neutrons does it have?
  - 45
  - 35
  - 44
  - 34
- All gases have \_\_\_\_\_.
  - definite shape and definite volume.
  - no definite shape, but definite volume.
  - no definite shape or definite volume.
  - definite shape, but no definite volume.
- Isotopes of the same element can differ in \_\_\_\_\_.
  - chemical properties.
  - mass number.
  - atomic number.
  - number of protons and electrons.
- Any change in a substance that is brought on by adding or taking away energy from that substance is called a/an \_\_\_\_\_.
  - phase change.
  - state change.
  - class change.
  - chemical change.
- In period 5 there are 18 elements. What sublevel(s) is(are) being filled?
  - s
  - d and f
  - s and p
  - s, p, and d
- The statement that no two electrons in the same atom can have the same four quantum numbers is \_\_\_\_\_.
  - the Pauli exclusion principle.
  - Hund's rule.
  - the Aufbau principle.
  - Bohr's law.
- Nitrogen's electron configuration is  $1s^2 2s^2 2p^3$ . To what group does nitrogen belong?
  - 2
  - 7
  - 15
  - 17
- Since the first energy level contains only a 1s sublevel, the number of elements in this period is \_\_\_\_\_.
  - 1.
  - 2.
  - 4.
  - 8.
- The elements located in the periodic table in Group 2 are also known as the \_\_\_\_\_.
  - alkali metals.
  - rare earth series.
  - alkaline earth metals.
  - halogens.
- The number of valence electrons in Group 2 elements is \_\_\_\_\_.
  - 2
  - 8
  - 18
  - equal to the period number



\_\_\_\_\_

37. How many atoms are represented by 40.1 g S?

\_\_\_\_\_

**Electron Configuration:** Write electron configuration notation for the following elements (3 pts ea).

38. Aluminum, atomic number 13 \_\_\_\_\_

39. Scandium, atomic number 21 \_\_\_\_\_

**Matching:** Write the letter of the family in the second column that matches the description in the first column (2 points each).

- |           |   |    |                       |
|-----------|---|----|-----------------------|
| _____ 40. | very reactive elements that combine with metals to form salts                                     | a. | alkali metals         |
| _____ 41. | contain a pair of electrons in the outermost s sublevel and no p electrons in the outermost level | b. | halogens              |
| _____ 42. | represent filling of 5f sublevel, all radioactive   | c. | alkaline-earth metals |
| _____ 43. | react violently with water to form bases  | d. | actinides             |
| _____ 44. | have a full valence shell   | e. | noble gases           |

**Essay Questions:** Answer the question with four or more complete sentences (10 points each).

45. What are the properties of halogens? What Group are they in? Why?

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

46. List and explain four properties of nonmetals? Where are they located? Do they give up or take electrons?

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