Multiple choice (42 total points; 3 points each) Choose the best answer for each of the following questions. Mark the correct answer in the space provided next to each question. Choose only one answer for each question.

1. Which of the following is an example of a mixture?
   a) milk     b) nitrogen  c) water     d) iron

2. The subatomic particles, listed in order of increasing mass, are as follows:
   a) neutrons < electrons < protons
   b) protons < neutrons < electrons
   c) electrons < protons < neutrons
   d) neutrons < protons < electrons

3. What is the charge assigned to a proton?
   a) +1     b) 0       c) –1     d) +2

4. The sulfur ion has a charge of:
   a) +2     b) +1     c) –1     d) –2

5. What atom has the following electron configuration?
   \(1s^22s^22p^63s^23p^64s^1\)
   a) K     b) Ca       c) Na     d) Xe

6. According to Rutherford’s gold foil experiment, the nucleus of the atom has a ___ charge:
   a) neutral  b) negative  c) zero     d) positive

7. Which of the following describes a chemical change?
   a) Ice melting into water
   b) Methanol boiling at 64°C
   c) Molten lava hardening into rock
   d) Gasoline burning

8. According to the Law of Multiple Proportions, which of the following molecules is impossible?
Fill in the blank (58 total points) Give the correct answer for each of the following questions. Partial credit will be given to those questions in which a valid attempt have been made in answering the questions correctly.

1. Complete the following sentences (3pts each):
   a) The element _______________________ has the symbol Cu
   b) The element silicon has the symbol ____________________.

2. For the following two isotopes, give the number of protons, neutrons, and electrons (2 point each)

   \[
   \begin{array}{c|c|c|c|c|c|c|c|c|c}
   \text{element} & \text{protons} & \text{neutrons} & \text{electrons} \\
   \hline
   {^{37}\text{Cl}}_{17} & \text{protons =} & \text{neutrons =} & \text{electrons =} \\
   {^{59}\text{Ni}}_{28} & \text{protons =} & \text{neutrons =} & \text{electrons =} \\
   \end{array}
   \]
3. Perform the following conversions with correct significant figures (4pts each)
   a) $5.2 \text{ m} = \underline{\quad} \text{ km}$
   
   b) $12.99 \text{ g} = \underline{\quad} \text{ mg}$
   
   c) $22.345 \text{ in} = \underline{\quad} \text{ cm} = \underline{\quad} \text{ m}$

4. Write out the Lewis Dot Structure for the following atoms or ions (3pts. each)
   a) N   
   b) Br⁻

4. Give the electron configuration for the following elements (3 pts. each)
   a) P   
   b) Ar

5. Give the elemental symbol for an element that satisfies the following criteria: (3 points each)
   a) a member of Group IIA or 2A
   b) noble gas
   c) transition metal
   d) main group element