

Unit 1 Chemistry Test Free Response Questions

Your answers to each question are worth a maximum of ten points each. Points are earned in the following ways:

3 pts: English writing conventions – the student writes complete sentences with proper punctuation and grammar. The question is restated in the context of the answer.

4 pts: The answer addresses the question that was asked. Required examples, explanations and illustrations are provided, though they might not be correct.

3 pts: The answer is conceptually correct.

1. Using complete sentences, describe the structure of an atom of fluorine -19. Explain which subatomic particles are found in the nucleus and which subatomic particle is found in the electron cloud. Include the charges and relative mass numbers and total number of each of these subatomic particles.
2. Describe the differences in atomic composition that distinguish carbon-12 from carbon-14.
3. Explain the differences between chemical reactions and nuclear reactions in terms of the amount of energy produced in each. Give an example of a chemical reaction that produces energy and a nuclear reaction that produces energy.
4. The density of the nucleus is an astounding 100 million metric tons per cubic centimeter. Explain in terms of atomic particles and their masses how the nucleus can be so dense.
5. "We are all made of stardust." Explain the process by which stars make the elements in the human body.
6. An atom of carbon – 12 is slammed into an atom of helium – 4. In sentence format, name the new element and give its atomic number, mass number and expected numbers of protons, neutrons and electrons.