

Answer the following questions on a separate sheet of paper. Use complete sentences where appropriate.

Section 5.1

1. What is the model of the atom so far in this textbook?
2. What couldn't this model explain about metals?
3. What couldn't Rutherford's model explain?
4. Why is there a picture of a horseshoe?
5. How is Bohr's model different from Rutherford's?
6. What is an energy level?
7. How is an energy level like a ladder?
8. What is a quantum?
9. Why aren't the ladders the same in Figure 5.3?
10. Why did the model of the atom have to change?
11. What is the quantum mechanical model?
12. How is the quantum mechanical model different?
13. How is it like a propeller?
14. What two things does solving Schödinger's equation give you?
15. What are energy sublevels?
16. What are the shapes of the
 - a. s orbitals?
 - b. p orbitals
 - c. d orbitals
17. How can you find the maximum number of electrons in an energy level?

Section 5.2

1. Which direction does energy change?
2. What is the aufbau principle?
3. Where do the energy levels overlap?
4. What is the Pauli exclusion principle?
5. What is electron spin?
6. What is Hund's rule?
7. In the shorthand method how do you indicate
 - a. Energy level
 - b. Energy sublevel
 - c. Number of electrons in that sublevel
8. Why does the order differ?
9. Why do some elements have filling orders different from the aufbau diagram?

Section 5.3

1. Where did the quantum mechanical model come from?
2. By 1900 what did scientists think that light was?
3. What is amplitude?
4. What is wavelength and its symbol?
5. What is frequency and its symbol?
6. How are frequency and wavelength related? In words and as a mathematical equation.
7. What is electromagnetic radiation?
8. What is a spectrum?
9. How is the spectrum of white light different from helium?
10. When do atoms emit energy?
11. What is an atomic emission spectrum?
12. What is each line in a spectrum?
13. How is a spectrum like a fingerprint?
14. What did Bohr's model explain?
15. How are energy and frequency related?
16. Where didn't Bohr's model work?
17. How does the quantum mechanical model explain the motion of material objects?
18. What are quanta?
19. What are photons?
20. How was DeBroglie mathematical expression tested?
21. What objects have wavelike nature?
22. Why don't we see this wavelike nature?
23. How are classical and quantum mechanics different?
24. What is the Heisenberg uncertainty principle?
25. What paved the way for Schrödinger's description of the atom?