Q2W1- Qs. Bank-Completing the model of the atom.

Modified True/False
Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 1. The Bohr model of the atom could be correctly applied to only one atom, the helium atom.
_____

____ 2. The higher the frequency of electromagnetic radiation, the lower its wavelength.
_____

____ 3. In moving from a lower energy level to a higher energy level in an atom, an electron emits energy.
_____

____ 4. The designations used to represent electron energy sublevels in an atom are *a*, *b*, *c*, and *d*.
_____

____ 5. The 1*s* orbital is farther from the nucleus than is the 2*s* sublevel. _____

____ 6. The maximum number of electrons in any *p* sublevel is six. _____

____ 7. All *s* orbitals are spherical. _____

____ 8. The three *p* orbitals in an energy level are arranged at right angles to each other.
_____

____ 9. The maximum number of electrons in any *f* sublevel is 18. _____

____ 10. The symbol [He] stands for the electron configuration $1s^2 2s^2 2p^6$. _____

____ 11. The configuration [He]$2s^2 2p^4$ is an abbreviated form of the configuration $1s^2 2s^2 2p^4$.
_____

____ 12. In general, the closer an orbital is to the nucleus, the more energy an electron possesses.
_____

____ 13. When an electron absorbs a specific amount of energy, the electron can jump to a higher energy level.
_____

____ 14. The results of Rutherford's gold foil experiment suggested that most of an atom is solid.
_____

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 15. If a wave has a high frequency, it also has _____.
a. high wavelength and high energy
b. high wavelength and low energy
c. low wavelength and high energy
d. low wavelength and low energy

____ 16. Light is released when an electron moves from higher energy levels to a lower energy level. The resulting spectrum is a(n) _____ spectrum.
a. absorption
b. emission
c. excitation
d. lower energy

____ 17. Electron 1 falls from energy level four to energy level two. Electron 2 falls from energy level three to energy level two. Which electron is more likely to emit red light?
a. 1
c. Neither electron could emit red light.

b. 2
d. Both electrons emit red light.

____ 18. Which of the following is the best evidence for the existence of sublevels?
a. large gaps in a spectrum
b. only four lines in a spectrum
c. all colors of light in a spectrum
d. closely spaced lines in a spectrum

____ 19. If an atom contains six energy levels, how many sublevels does it contain?
a. one
b. two
c. four
d. six

____ 20. Which of the following orbitals is closest to the nucleus?
a. 1*s*
b. 2*p*
c. 4*s*
d. 3*d*

____ 21. Compare the maximum number of electrons possible in sublevel 3*d* with the maximum number that could be in sublevel 4*d*.
a. They are the same.
b. There are more in 3*d*.
c. There are more in 4*d*.
d. They are impossible to compare.

____ 22. A *p* orbital has a _____ shape.
a. spherical
b. doughnut
c. dumbbell
d. circular

____ 23. An atom is in Group 2, Period 3. How many electrons does the atom contain?
a. 2
b. 3
c. 6
d. 12

____ 24. Which is a possible last sublevel for an element found in Group 18?
a. $3p^6$
b. $4s^2$
c. $4p^3$
d. $4d^8$

____ 25. An element is most likely to have properties similar to those of _____.
a. another element in the same period
b. another element in the same group
c. a noble gas
d. a transition element

____ 26. Transition elements have final electrons in the _____ sublevel.
a. *s*
b. *p*
c. *d*
d. *f*

____ 27. What are the valence electrons in the electron configuration of tin, $[Kr]4d^{10}5s^25p^2$?
a. [Kr]
b. $4d^{10}$
c. $5s^25p^2$
d. $5p^2$

____ 28. What is the highest occupied sublevel in the structure of an atom of arsenic?
a. 3*s*
b. 3*p*
c. 3*d*
d. 4*p*

____ 29. What element has the electron configuration of $[Ne]3s^23p^1$?
a. aluminum
b. boron
c. silicon
d. sodium

____ 30. The conclusion that it's impossible to measure accurately both the position and the energy of an electron at the same time was made by _____.
a. Bohr
b. Dalton
c. Heisenberg
d. Proust

Completion

Complete each statement.

31. Within a sublevel, electrons fill the *s* _____ first.

32. The most stable arrangement of electrons in an atom is a(n) _____.

33. The last electron of a(n) _____ occupies an inner-level 4*f* orbital in the sixth period or a 5*f* orbital in the seventh period.

34. You can write _____ by interpreting the periodic table using *s*, *p*, *d*, and *f* blocks.

35. State the total number of electrons in an atom that has each of the following electron configurations: [He]$2s^2$ _____, [Ne]$3s^2 3p^1$ _____, and [Ar]$4s^1$ _____.

Matching

Match each statement with the correct item below.

a. *s*, *p*, *d*, or *f* within an energy level
b. can hold a maximum of two electrons
c. $1s^2 2s^2 2p^6 3s^2 3p^6$
d. lanthanide or actinide
e. discovery led to electron cloud model

____ 36. electron configuration
____ 37. Heisenberg uncertainty principle
____ 38. inner transition element
____ 39. orbital
____ 40. sublevel

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Answer Section

MODIFIED TRUE/FALSE

1. ANS: F, hydrogen

   PTS: 1 DIF: B OBJ: 7-2
2. ANS: T PTS: 1 DIF: B
   OBJ: 7-1
3. ANS: F, absorbs

   PTS: 1 DIF: B OBJ: 7-1
4. ANS: F, *s*, *p*, *d*, and *f*

   PTS: 1 DIF: B OBJ: 7-3
5. ANS: F, closer to

   PTS: 1 DIF: B OBJ: 7-2
6. ANS: T PTS: 1 DIF: B
   OBJ: 7-2
7. ANS: T PTS: 1 DIF: B
   OBJ: 7-3
8. ANS: T PTS: 1 DIF: B
   OBJ: 7-3
9. ANS: F, 14

   PTS: 1 DIF: B OBJ: 7-2
10. ANS: F, $1s^2$

    PTS: 1 DIF: B OBJ: 7-4
11. ANS: T PTS: 1 DIF: B
    OBJ: 7-4
12. ANS: F, less

    PTS: 1 DIF: B OBJ: 7-2
13. ANS: T PTS: 1 DIF: B
    OBJ: 7-2
14. ANS: F, empty space

    PTS: 1 DIF: B OBJ: 7-2

MULTIPLE CHOICE

15. ANS: C PTS: 1 DIF: B OBJ: 7-1
16. ANS: B PTS: 1 DIF: B OBJ: 7-1
17. ANS: B PTS: 1 DIF: A OBJ: 7-1

18. ANS: D PTS: 1 DIF: B OBJ: 7-1
19. ANS: D PTS: 1 DIF: B OBJ: 7-2
20. ANS: A PTS: 1 DIF: B OBJ: 7-2
21. ANS: A PTS: 1 DIF: B OBJ: 7-2
22. ANS: C PTS: 1 DIF: B OBJ: 7-2
23. ANS: D PTS: 1 DIF: A OBJ: 7-4
24. ANS: A PTS: 1 DIF: A OBJ: 7-4
25. ANS: B PTS: 1 DIF: B OBJ: 7-4
26. ANS: C PTS: 1 DIF: B OBJ: 7-4
27. ANS: C PTS: 1 DIF: A OBJ: 7-3
28. ANS: D PTS: 1 DIF: B OBJ: 7-4
29. ANS: A PTS: 1 DIF: A OBJ: 7-4
30. ANS: C PTS: 1 DIF: B OBJ: 7-1

COMPLETION

31. ANS: orbital

    PTS: 1 DIF: B OBJ: 7-2
32. ANS: electron configuration

    PTS: 1 DIF: B OBJ: 7-2
33. ANS: inner transition element

    PTS: 1 DIF: B OBJ: 7-3
34. ANS: electron configurations

    PTS: 1 DIF: B OBJ: 7-3
35. ANS: 4, 13, 19

    PTS: 1 DIF: B OBJ: 7-3

MATCHING

36. ANS: C PTS: 1 DIF: B OBJ: 7-3
37. ANS: E PTS: 1 DIF: B OBJ: 7-2
38. ANS: D PTS: 1 DIF: B OBJ: 7-3
39. ANS: B PTS: 1 DIF: B OBJ: 7-2
40. ANS: A PTS: 1 DIF: B OBJ: 7-2