Ch.Q1W2-Qs.Bank

Multiple Choice

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

 1.	The first subatomic particle discovered was the	e	
	a. proton	c.	electron
	b. neutron	d.	nucleus
 2.	The scientific statement that says that compour	nds a	always have exactly the same composition by mass is the
	a. atomic theory	c.	law of conservation of matter
	b. matter hypothesis	d.	law of definite proportions
 3.	When a hypothesis is tested by many experiment	nts,	it becomes a(n)
	a. scientific law	c.	theory
	b. revised hypothesis	d.	experimental fact
 4.	The only subatomic particle that does not carry	an	electric charge is the
	a. proton	c.	electron
	b. neutron	d.	nucleus
 5.	The atomic number of an element whose atoms	s hav	ve 9 protons and 10 neutrons is
	a. 9	с.	10
	b. 19	d.	18
 6.	The mass number of an element whose atoms l	nave	a 12 protons and 13 neutrons is
	a. 12	с.	25
_	b. 13	a.	12.5
 7.	One isotope of carbon has 6 protons and 6 neut	trons	s. The number of protons and neutrons of a second isotope
	of carbon would be	0	7 and 7
	a. $7 \text{ and } 0$ b. 6 and 7	c. d	/ and /
0	The correct way to arrange the three forms of a	u.	romagnetic radiation listed below from highest to lowest
 0.	frequency, is	lect	to inagnetic radiation listed below, from highest to lowest
	a. ultraviolet > visible > infrared	c.	infrared > visible > ultraviolet
	b. visible > ultraviolet > infrared	d.	infrared > ultraviolet > visible
 9.	first proposed that matter is made up of	ator	ns, the smallest particles of matter.
	a. Democritus	с.	Proust
	b. Lavoisier	d.	Dalton
 10.	According to the law of conservation of matter hydrogen chloride, how many grams of chlorin	, if 4 e re	4.0 g of hydrogen react with chlorine to produce 146 g of acted?
	a. 4.0 g	c.	146 g
	b. 142 g	d.	150 g
 11.	If 9.0 g of water contain 1.0 g of hydrogen, wh	at m	hass of oxygen is contained in 36 g of water?
	a. 4.0 g	c.	10.0 g
	b. 8.0 g	d.	32 g
 12.	Which of the following statements is not a mai	n po	int of Dalton's atomic theory?
	a. All matter is made up of atoms.		
	b. Atoms are made up of smaller particles.		
	c. Atoms are indestructible.		
	d. All atoms of one element are exactly alike, elements.	but	they are different from atoms of other

 	13.	J.J. Thomson used a cathode ray to discover th	e	
		a. atom	c.	proton
		b. electron	d.	neutron
 	14.	If a scientist studies a beam of particles, and th particles are most likely	ose	particles are attracted to a negatively charged plate, the
		a. atoms	c.	protons
		b. electrons	d.	neutrons
 	15.	What is a good comparison of the charge of an	elec	etron and the charge of a proton?
		a. They are equal, but opposite.	c.	They are the same.
		b. The charge of the electron is larger.	d.	The charge of the proton is larger.
 	16.	Iodine-131 and iodine-127 are examples of		
		a. nuclei	c.	isotopes
		b. isomers	d.	neutrons
 	17.	The discovery of isotopes led to the discovery	of _	
		a. atoms	c.	protons
		b. electrons	d.	neutrons
 	18.	The experimentation of led to the theory	/ tha	t the atom is a sphere of mostly empty space, with a
		positively charged nucleus with electrons around	nd it	
		a. Bohr	c.	Rutherford
		b. Nagaoka	d.	Thomson
 	19.	Which of the following are definitely in atoms	of the	he same element?
		a. 3 protons, 3 neutrons and 3 protons, 4 neut	rons	
		b. 3 protons, 3 neutrons and 4 protons, 4 neut	rons	
		c. 4 protons, 4 neutrons and 3 protons, 4 neut	rons	
	•	d. 3 protons, 4 neutrons and 4 protons, 3 neut	rons	
 	20.	Atomic mass units are based on the mass of an	ator	m of
		a. carbon-12	с.	oxygen-16
	•	b. carbon-14	a.	nitrogen-14
 	21.	The is where the electron is most likely	to b	e found.
		a. energy level	с. 1	electron cloud
	22		a.	
 	22.	An atom of iron contains 26 electrons. How ma	any	energy levels are needed to contain these electrons?
		a. 1 b. 2	C.	5
	22		u.	
 	23.	I he atomic number of chlorine is 17. How mai	ny v	alence electrons does an atom of chlorine have?
		a. 2 b. 7	c.	8 17
	24		u.	
 	24.	In a Lewis dot diagram, the dots represent	11	the protons
		a. all the electrons	с. Л	the poutrons
		o. the valence electrons	u.	

Completion

Complete each statement.

25. In science, a testable prediction to explain observations is known as a(n) ______.

26. The neutral particle found within an atom is the ______.

- 27. The sum of the protons and neutrons in the nucleus of an atom is called the ______ of that atom.
- 28. The space around the nucleus of an atom where the atom's electrons are found is called the
- 29. A system used to represent the valence electrons around the chemical symbol of an element is the
- 30. The positively-charged, subatomic particle is a(n) ______.
- 31. According to the ______, the elements that make up a compound always occur in the same mass proportion.
- 32. A fact of nature that has been confirmed many times by observation is known as a(n)
- 33. The range of all forms of radiant energy is given the name ______.
- 34. A(n) ______ is the region of space where electrons of a certain energy move about the nucleus of an atom.
- 35. The smallest particle of which matter consists is a(n) ______.
- 36. A(n) ______ is found in the outermost energy level of an atom.
- 37. The number of protons in the nucleus of an atom of an element is the ______ of that element.
- 38. The ______ is the idea that matter is made up of fundamental particles called atoms.
- 39. A negatively charged particle found in all atoms is the ______.
- 40. Use the square from the periodic table shown in Figure 2-3 to complete the blanks.



Figure 2-3

Atomic number	
Symbol	
Name of element	
Atomic mass	
State of element _	

Short Answer

- 41. How did Thomson's discovery of neon's isotopes lead to the discovery of neutrons?
- 42. Why is it difficult to detect the presence of isotopes of an element during chemical studies?

- 43. How is the movement of electrons between energy levels like climbing a ladder?
- 44. Sequence the following parts of a scientific method: experiment, hypothesis, observation, revised hypothesis, theory.
- 45. An atom of tin has atomic number of 50 and mass number of 119. How many protons, neutrons, and electrons does this atom of tin contain?
- 46. What is the atomic mass of hafnium if, out of every 100 atoms, 5 have mass 176, 19 have mass 177, 27 have mass 178, 14 have mass 179, and 35 have mass 180.0?
- 47. What two factors determine the location of an electron around the nucleus?

Problem

These three boxes shown in Figure 2-1 are taken from the periodic table. They represent elements that have no known isotopes. Use the information contained in these boxes to supply the information requested for the atoms of each element. For atomic structure, give the number of protons, neutrons, and electrons.



Figure 2-1

48.

Beryllium:	Mass number for this atom:
	Atomic structure:

49.

Scandium:	Mass number for this atom:
	Atomic structure:

50.

Manganese: Mass number for this atom: Atomic structure:

The diagram in Figure 2-2 represents a potassium atom. Answer the questions about the electron transitions that take place in this atom.



Figure 2-2

- 51. How many valence electrons does this atom have?
- 52. Draw a Lewis dot diagram for this atom.
- 53. Suppose you wanted to observe an emission spectrum for this atom. How would you produce such a spectrum? Explain how this action would produce a spectrum.
- 54. Suppose that a potassium atom absorbs energy that causes two electrons to move up to the fifth energy level: one from the fourth energy level and one from the third. In terms of emission spectra, what will happen when the electrons return to their original levels?
- 55. If enough energy was added to the atom to permit an electron to escape from the atom, which electron would it be?

This set of data is similar to those on which Joseph Louis Proust based his law of definite proportions in 1799. Answer these questions about these data and their interpretation.

Trial	Nitrogen Mass	Oxygen Mass
101	13.9 g	16.0 g
102	25.8 g	29.2 g
103	19.7 g	22.3 g
104	31.8 g	36.2 g

- 56. Calculate the percentage of nitrogen and oxygen for each of the four trials shown here.
- 57. How do the results of these experiments lead to the law of definite proportions?
- 58. How are the law of definite proportions and the atomic theory related to each other?
- 59. To the nearest whole number, the atomic masses of nitrogen and oxygen are 14 and 16, respectively. Calculate the percentage composition of a compound made by combining one atom of nitrogen with one atom of oxygen.
- 60. Assign a chemical formula to the compound formed between one atom of nitrogen and one atom of oxygen.

Q1W2-Qs. Bank Answer Section

MULTIPLE CHOICE

1.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-1
2.	ANS:	D	PTS:	1	DIF:	В	OBJ:	2-1
3.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-1
4.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-2
5.	ANS:	А	PTS:	1	DIF:	В	OBJ:	2-2
6.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-2
7.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-2
8.	ANS:	А	PTS:	1	DIF:	В	OBJ:	2-5
9.	ANS:	А	PTS:	1	DIF:	В	OBJ:	2-1
10.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-1
11.	ANS:	D	PTS:	1	DIF:	А	OBJ:	2-1
12.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-1
13.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-1
14.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-1
15.	ANS:	А	PTS:	1	DIF:	В	OBJ:	2-2
16.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-2
17.	ANS:	D	PTS:	1	DIF:	В	OBJ:	2-2
18.	ANS:	С	PTS:	1	DIF:	В	OBJ:	2-1
19.	ANS:	А	PTS:	1	DIF:	А	OBJ:	2-2
20.	ANS:	А	PTS:	1	DIF:	В	OBJ:	2-2
21.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-4
22.	ANS:	С	PTS:	1	DIF:	Α	OBJ:	2-5
23.	ANS:	В	PTS:	1	DIF:	А	OBJ:	2-5
24.	ANS:	В	PTS:	1	DIF:	В	OBJ:	2-6

COMPLETION

25. ANS: hypothesis

26.	PTS: ANS:	1 neutron	DIF:	В	OBJ:	2-1
27.	PTS: ANS:	1 mass number	DIF:	В	OBJ:	2-2
28.	PTS: ANS:	1 electron cloud	DIF:	В	OBJ:	2-2
29.	PTS: ANS:	1 Lewis dot diag	DIF: gram	В	OBJ:	2-2

30.	PTS: ANS:	1 proton	DIF:	В	OBJ:	2-6
31.	PTS: ANS:	1 law of definite	DIF: propor	B rtions	OBJ:	2-2
32.	PTS: ANS:	1 scientific law	DIF:	В	OBJ:	2-1
33.	PTS: ANS:	1 electromagneti	DIF: c spect	B trum	OBJ:	2-1
34.	PTS: ANS:	1 energy level	DIF:	В	OBJ:	2-1
35.	PTS: ANS:	1 atom	DIF:	В	OBJ:	2-5
36.	PTS: ANS:	1 valence electro	DIF: on	В	OBJ:	2-2
37.	PTS: ANS:	1 atomic number	DIF: r	В	OBJ:	2-4
38.	PTS: ANS:	1 atomic theory	DIF:	В	OBJ:	2-2
39.	PTS: ANS:	1 electron	DIF:	В	OBJ:	2-1
40.	PTS: ANS:	1 24, Cr, chromi	DIF: um, 51	B .9961, solid	OBJ:	2-2
	PTS:	1	DIF:	В	OBJ:	2-3

SHORT ANSWER

41. ANS:

Scientists hypothesized that atoms must contain a third type of particle to account for the difference in the masses of the neon atoms.

PTS: 1 DIF: B OBJ: 2-1

42. ANS: Isotopes of an element all have the same chemical properties and would behave in the same way during a chemical study.

PTS: 1 DIF: B OBJ: 2-2

43. ANS:

	When you climb a law from one energy leve some rungs; electron	dder, you el to anoth s can jum	n must step on her; they can't np over energy	the run exist bo levels	gs; you can't step between them. Electrons must move etween them. When you climb a ladder, you can skip over to get to other energy levels.			
44.	PTS: 1 ANS:	DIF: A	A 	OBJ:	2-5			
	observation, hypothe	sis, exper	riment, revised	hypot	hesis, theory			
45.	PTS: 1 ANS:	DIF: 1	В	OBJ:	2-1			
	50 protons, 69 neutro	50 protons, 69 neutrons, 50 electrons						
46.	PTS: 1 ANS: 178.55	DIF: 1	В	OBJ:	2-2			
47.	PTS: 1 ANS:	DIF: A	A	OBJ:	2-3			
	the speed (energy) of	f the elect	tron, the attract	tion of	the nucleus			
	PTS: 1	DIF: 1	В	OBJ:	2-4			

PROBLEM

48.	ANS: 9; $(4 p^+ + 5)$	$(5 n^0)$ and $(4e^-)$			
49.	PTS: 1 ANS:	DIF:	В	OBJ:	2-3
	45; (21 <i>p</i> ⁺	$+ 24 n^0$) and $21e^-$			
	PTS: 1	DIF:	В	OBJ:	2-3
50.	ANS: 55; (25 <i>p</i> ⁺	+ 30 n^0) and $25e^-$			
	PTS·1	DIF	в	OBI-	2-3
51.	ANS:	DII.	D	010	23
	It has one	valence electron.			
	PTS: 1	DIF:	В	OBJ:	2-6
52.	ANS: The Lewis	dot diagram is K			
	DTC 1		D	ODL	2.6
53.	ANS:	DIF:	В	ORI:	2-6
	·· •				

Supply high-voltage electricity or radiation to the atom. Electrons will be raised to higher energy levels. Then they fall back to lower energy levels, giving off radiation that forms line spectra.

PTS: 1 DIF: A OBJ: 2-4

54.	ANS: Each electron will release energy, but the one that falls back to the third level will release more energy. Two spectral lines of differing energy will therefore result.					
55.	PTS: 1 ANS: The first electron because that elec	DIF: A to leave the atom stron is the most dis	OBJ: 2-4 would be one in the highest ene	rgy level. It is least attracted to the nucleus		
56.	PTS: 1 ANS: 46.5, 53.5; 46.9,	DIF: B 53.1; 46.9, 53.1; 4	OBJ: 2-5 6.8, 53.2			
57.	PTS: 1 ANS: The compound f	DIF: A	OBJ: 2-1 rogen and oxygen always has th	e same proportion.		
58.	PTS: 1 ANS: The law of defin atoms that are alt	DIF: B ite proportions can ways the same with	OBJ: 2-2 be explained if you assume that a constant mass.	both nitrogen and oxygen are made of		
59.	PTS: 1 ANS: The compound w	DIF: B would have a comp	OBJ: 2-1 osition of 46.7 percent nitrogen	and 53.3 percent oxygen.		
60.	PTS: 1 ANS: The formula is N	DIF: A	OBJ: 2-1			
	PTS: 1	DIF: B	OBJ: 2-1			