

- A particular radioactive element has a half-life of 6.41 days. What percent of the original sample is left after 15.0 days?
 - 80.3%
 - 44.4%
 - 9.9%
 - 39.5%
 - 19.7%
- An experiment requires 25.3 g of ethyl alcohol (density = 0.790 g/mL). What volume, in liters, will be required?
 - 2.00×10^{-2} L
 - 3.12×10^{-5} L
 - 3.20e4 L
 - 3.20×10^{-2} L
 - 20.0 L
- At 20°C the density of mercury is 13.6 g/cm³. What is the mass of 16.5 mL of mercury at 20°C?
 - 2.24×10^2 g
 - 1.21 g
 - 1.00 g/mL
 - 0.824 g
 - none of these
- If a 100.-g sample of platinum metal has a volume of 4.668 mL, what is the density of platinum in g/cm³?
 - 21.4 g/cm³
 - 2.14 g/cm³
 - 0.0467 g/cm³
 - 467 g/cm³
 - none of these
- An example of a chemical change is
 - boiling alcohol
 - grinding coffee beans.
 - digesting a pizza
 - coffee spilled on a shirt
 - an ice cube melting in a drink
- How many atoms of hydrogen are in one molecule of CH₃Cl?
 - 6
 - 2
 - 3
 - 5
 - 4
- How many neutrons are there in one atom of $^{46}_{22}\text{Ti}$?
 - 22
 - 24
 - 46
 - 68
 - none of these
- Which of the following elements is an alkaline earth metal?
 - Ca
 - Cu
 - Fe
 - Na
 - Sc
- An example of a mixture is
 - hydrogen fluoride
 - purified water
 - gold
 - the air in this room
 - all of these
- Which of the following involves a chemical change?
 - boiling water
 - melting ice
 - chopping wood
 - cooking an egg
 - none of these
- Which of the following is an element?
 - brass
 - salt
 - water
 - earth
 - oxygen
- The symbol for the element strontium is
 - S
 - St
 - Sm
 - Str
 - Sr
- How many atoms are represented by one formula unit of aluminum dichromate, Al₂(Cr₂O₇)₃?
 - 14
 - 25
 - 27
 - 29
 - none of these
- How many nitrogen atoms are indicated by the formula Al(NO₃)₃?
 - 1
 - 3
 - 9
 - 4
 - 0
- List the three main subatomic particles.

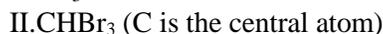
16. How many protons, electrons, and neutrons, respectively, does ^{16}O have?
 A) 8, 18, 8
 B) 8, 8, 8
 C) 8, 10, 8
 D) 8, 14, 8
 E) 8, 18, 16
17. The number of neutrons in one atom of $^{206}_{82}\text{Hg}$ is
 A) 82
 B) 206
 C) 124
 D) 288
 E) none of these
18. An atom with 15 protons and 16 neutrons is an atom of
 A) P
 B) Ga
 C) S
 D) Pd
 E) Rh
19. How many neutrons are contained in an iodine nucleus with a mass number of 131?
 A) 53
 B) 74
 C) 78
 D) 127
 E) 131
20. An atom with 45 protons has a mass number of 99. It must contain how many neutrons?
 A) 144
 B) 45
 C) 99
 D) 54
 E) none of these
21. Which of the following elements is most similar to lithium?
 A) Au
 B) He
 C) Na
 D) Hg
 E) Mg
22. When $^{230}_{90}\text{Th}$ decays by producing an alpha particle, the product nuclide is _____.
23. Alpha particles are
 A) electrons
 B) protons
 C) neutrons
 D) helium nuclei
 E) X rays
24. The cesium-131 nuclide has a half-life of 30 years. After 90 years, about 6 g remains. The original mass of the cesium-131 sample is closest to
 A) 30 g
 B) 40 g
 C) 50 g
 D) 60 g
 E) 70 g
25. Which of these is an element?
 A) water
 B) iron ore
 C) wood
 D) silver
 E) brass
26. How many atoms of oxygen are in one formula unit(compound) of calcium hydrogen sulfate?
 A) 3
 B) 4
 C) 5
 D) 6
 E) 8
27. How many protons, electrons, and neutrons, respectively, does $^{27}\text{Al}^{3+}$ have?
 A) 13, 13, 14
 B) 13, 10, 14
 C) 13, 13, 27
 D) 13, 10, 27
 E) 13, 13, 13
28. Which of the following exhibits the correct orders (decreasing) for both atomic radius and ionization energy, respectively?
 A) S, O, F, and F, O, S
 B) F, S, O, and O, S, F
 C) S, F, O, and S, F, O
 D) F, O, S, and S, O, F
 E) none of these
29. The electron configuration for Cr^{2+} is
 A) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$
 B) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
 C) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4$
 D) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$
 E) none of these
30. An element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$. The element is a(n)
 A) nonmetal.
 B) transition element.
 C) metal.
 D) lanthanide.
 E) actinide.

31. Antimony can be represented by which of the following noble gas configurations?
- $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 5d^{10} 5p^5$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 5d^{10} 5p^6$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^3$
32. Which of the following best describes the "trend" for electronegativity across periods (L→R) and down groups, respectively (periods/groups)?
- Decrease / Decrease
 - Increase / Decrease
 - Decrease / Increase
 - Increase / Increase
 - neither
33. When an electron in the ground state absorbs energy, it goes to a(n) _____ state.
- excited
 - lower
 - frenetic
 - ionic
 - stable
34. Which of the following has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$?
- Cr
 - Ca
 - Mn
 - Br
 - none of these
35. Which of the following is the atomic number of a halogen?
- 10
 - 13
 - 17
 - 136
 - 27
36. Which of the following statements *BEST* describes the alkali metal?
- They have two valence electrons, and they form ions with a 2- charge.
 - They have two valence electrons, and they form ions with a 2+ charge.
 - They have one valence electron, and they form ions with a 1+ charge.
 - They have one valence electron, and they form ions with a 1- charge.
 - They have one valence electron, and they form ions with a 2- charge.
37. An atom that has an electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6$ is classified as
- a noble gas element
 - a transition metal
 - an alkaline earth element
 - an alkali metal
 - a halogen
38. When magnesium and oxygen form a bond 2 electrons will be
- Shared equally
 - shared unequally
 - Lost by magnesium gained by oxygen
 - Lost by oxygen gained by magnesium
 - evenly distributed
39. A stable element will have how many valence electrons?
- 8
 - 32
 - 6
 - 18
 - Zero
40. What is the name of the compound whose formula is NO_2
- Nitrogen pentoxide
 - Dinitrogen oxide
 - Nitrogen oxide
 - nitrogen dioxide
 - Nitrogen (V) oxide
41. What is the correct chemical formula for copper(II) oxide?
- Cu_2O_3
 - Cu_3O
 - CuO_3
 - Cu_3O_2
 - CuO
42. What is the chemical formula for Mercury (I) oxide
- Hg_2O_2
 - Hg_2O
 - Hg_2O_4
 - HgO_2
 - HgO
43. Calculate the molar mass of Na_2SO_4 .
- 142 g
 - 100 g
 - 132 g/mol
 - 142 g/mol
 - 124 g/mol

44. The prefix “di” means
 A) 1
 B) 2
 C) 3
 D) 4
 E) 5
45. The chemical formula for dicarbon hexahydride is
 A) CH₄
 B) C₂H₆
 C) CH
 D) CH₂
 E) C₃H₈
46. With which of the following would fluorine atoms MOST easily combine to form an ionic compound?
 A) oxygen
 B) chlorine
 C) carbon
 D) Sodium
 E) sulfur
47. The electron configuration of carbon is $1s^2 2s^2 2p^2$. How many more electrons does carbon need to satisfy the octet rule?
 A) 1
 B) 4
 C) 8
 D) 5
 E) 2
48. These elements become more reactive as you decrease their atomic number.
51. Barium is this type of element
52. The cation of table salt is made from one of these types of elements
53. Nitrogen, Phosphorus, Sulfur, Oxygen represent these elements
54. The name for NaHCO₃ is
 A) sodium hydrogen carbonate (sodium bicarbonate)
 B) sodium carbonate
 C) sodium(I) hydrogen carbonate
 D) sodium(I) bicarbonate
 E) none of these
55. Titanium(IV) oxide has the formula
 A) Ti₄O
 B) TiO₄
 C) Ti(IV)O
 D) TiO₂
 E) Ti₄O₂
56. According to the following Nuclear Equation, ${}^{238}_{92}\text{U} \rightarrow {}^{234}_{90}\text{Th} + \text{_____}$, which particle is produced?
 A) ${}^0_0\gamma$
 B) ${}^4_2\text{He}$
 C) ${}^0_{-1}\beta$
 D) ${}^0_{+1}\beta$
 E) 1_0n

Use the following to answer question 65:

Consider the following molecules.



Select the molecule(s) that fit the given statement.

48. These molecules follow the octet rule.
 A) I, II, IV
 B) I, III, IV, VI
 C) III, V, VI
 D) I, IV, VI
 E) II, III, V

Use the following to answer questions 52-56:

- A) Halogens
 B) Alkaline Earth Metals
 C) Noble Gases
 D) Alkali Metals
 E) Metal/Non-metal

49. $1s^2 2s^2 2p^6 3s^2 3p^6$ Represents this type of element

57. What is the electron configuration of Al¹⁺³
 A) $1s^2 2s^2 2p^1$
 B) $1s^2 2s^2 2p^6$
 C) $1s^2 2s^2 2p^6 3s^2 3p^1$
 D) $1s^2 2s^2 2p^6 3s^2 3p^6$
 E) $1s^2 2s^2 2p^6 3s^2$

58. An atom with 75 neutrons, 52 protons, and 52 electrons

- A) ${}^{127}_{51}\text{Sb}$
 B) ${}^{120}_{52}\text{Te}$
 C) ${}^{127}_{50}\text{Te}$
 D) ${}^{75}_{52}\text{Te}$
 E) ${}^{127}_{52}\text{Te}$

59. Which describes the alkali metals?
- They have two valence electron and for ions with a +1 charge
 - They have one valence electron and for ions with a +1 charge
 - They have one valence electron and for ions with a +2 charge
 - They have two valence electron and for ions with a +2 charge
 - They have one valence electron and for ions with a +3 charge
60. What best describes the reasons for the atomic radius trends
- As you go down a group the energy level increases and as you go L → R across a period the proton charge decreases
 - As you go down a group the energy level decreases and as you go L → R across a period the proton charge increases
 - As you go down a group the energy level increases and as you go L → R across a period the proton charge increases
 - As you go down a group the energy level decreases and as you go L → R across a period the proton charge decreases
 - As you go up a group the energy level increases and as you go R → L across a period the proton charge increases
61. The electron configuration below represents which periodic table group $1s^2 2s^2 2p^6 3s^2 3p^6$
- Transition metal
 - Akali metal
 - Halogen
 - Noble Gas
 - Alkaline earth metal
62. What is the electron configuration for Cr^{+3}
- $1s^2 2s^2 2p^6 3s^2 3p^6$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$
 - $1s^2 2s^2 2p^6 3s^1$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$
63. The number 0.00003044 expressed in exponential notation is
- 3.044×10^{-5}
 - 3.0×10^{-5}
 - 3.044×10^5
 - 3.044×10^{-4}
 - 3.044
64. Express the number 0.00374 in scientific notation.
- 3.74×10^{-3}
 - 3.74×10^3
 - 0.374×10^{-3}
 - 374×10^{-5}
 - none of these
65. Convert: 42.2 cm = _____ m.
- 4.22×10^3 m
 - 4.22×10^4 m
 - 0.0422 m
 - 0.422 m
 - 4.22 m
66. Convert: 7.7 mm = _____ km.
- 7.7×10^{-6} km
 - 7.7×10^{-3} km
 - 7.7×10^3 km
 - 7.7×10^6 km
 - 7.7×10^2 km
67. Convert 9.16 kg to pounds (1 lb = 453.6 g).
- 20.2 lb
 - 2.02×10^{-2} lb
 - 4.15×10^3 lb
 - 4.15 lb
 - 4.15×10^6 lb
68. Convert 418.2 mi to kilometers (1 m = 1.094 yd; 1 mi = 1760. yd).
- 2.599×10^{-4} km
 - 6.728×10^5 km
 - 457.5 km
 - 2.376×10^{-1} km
 - 6.728×10^2 km
69. Perform the following conversion:
5.77 m/s = _____ km/h
- 20.8 km/h
 - 0.346 km/h
 - 1.60 km/h
 624. km/h
 173. km/h
70. Perform the following conversion:
5.67 m/s = _____ mi/h
- 0.395 mi/h
 - 12.7 mi/h
 284. mi/h
 211. mi/h
 - 11.3 mi/h

71. Draw the Lewis structures for the following compounds to assist you in answering this question.
 CBr_2H_2 BH_3 XeCl_4 SF_4 HCl
- How many of the compounds are nonpolar?
- A) 1
 B) 2
 C) 3
 D) 4
 E) 5
72. Which of the following compounds contains one or more covalent bonds?
- A) NaCl
 B) CaO
 C) CO_2
 D) Cs_2O
 E) BaBr_2
73. Which of the following compounds contains an ionic bond?
- A) $\text{HCl}(g)$
 B) NaCl
 C) CCl_4
 D) SO_2
 E) O_2
74. Which of the following elements has the lowest electronegativity?
- A) Na
 B) Rb
 C) Ca
 D) S
 E) Cl
75. Which of the following has nonpolar bonds?
- A) H_2S
 B) HCl
 C) Br_2
 D) OF_2
 E) All are nonpolar.
76. Which of the following bonds does **not** have a dipole moment?
- A) N-H
 B) O-H
 C) F-H
 D) H-H
 E) S-H
77. How many lone pairs of electrons are in the Lewis structure for ammonia, NH_3 ?
- A) 0
 B) 1
 C) 2
 D) 3
 E) 4
78. Draw the Lewis electron structure for the HI molecule.
79. Draw the Lewis electron structure for the H_2Te molecule.
80. Draw the Lewis structure for CO .
81. Which of the following molecules are polar? (Check all that apply.)
- A) CH_3OH
 B) CH_4
 C) H_2O
 D) C_2H_6
82. Which of the following has a double bond?
- A) H_2O
 B) NH_3
 C) O_2
 D) CO
 E) H_2S
83. Which of the following should have the lowest boiling point?
- A) CH_4
 B) C_2H_6
 C) C_3H_8
 D) C_4H_{10}
 E) C_5H_{12}
84. Which of the following species exhibit hydrogen bonding? (Check all that apply.)
- A) HBr
 B) NO_3^-
 C) H_2O
 D) SF_4
 E) KrCl_4
 F) I_3^-
- Use the following to answer questions 23-25:
 Identify the major attractive force in each of the following molecules.
85. CH_4
- A) dipole-dipole
 B) London dispersion
 C) ionic
 D) hydrogen bonding
 E) none of these

86. CO
A) dipole-dipole
B) London dispersion
C) ionic
D) hydrogen bonding
E) none of these
87. K₂O
A) dipole-dipole
B) London dispersion
C) ionic
D) hydrogen bonding
E) none of these
88. Consider the following compounds:
CO NH₃ CO₂ CH₄ H₂
How many of the compounds above exhibit London dispersion forces?
A) 1
B) 2
C) 3
D) 4
E) 5
89. Consider the following compounds:
CO NH₃ CO₂ CH₄ H₂
Which compound has the **highest** boiling point?
A) CO
B) NH₃
C) CO₂
D) CH₄
E) At least two of the above compounds have equally high boiling points.
90. Rank the following compounds from **lowest to highest** boiling point.
CH₃OH CH₄ H₂O C₂H₆
A) H₂O < CH₃OH < C₂H₆ < CH₄
B) C₂H₆ < CH₄ < CH₃OH < H₂O
C) CH₄ < C₂H₆ < CH₃OH < H₂O
D) CH₄ < C₂H₆ < H₂O < CH₃OH
E) CH₄ < CH₃OH < C₂H₆ < H₂O
91. Which of the following has the highest melting temperature?
A) H₂O
B) CO₂
C) S₈
D) MgF₂
E) P₄

Check your answers. Highlight the ones you got wrong. On page 128 list the question numbers you missed, next to them list the TOPIC that the question was about, and then show your correction next to it. The topics you missed are the topics you should study the most before the final!

Answer Key

1. E
2. D
3. A
4. A
5. C
6. C
7. B
8. A
9. D
10. D
11. E
12. E
13. D
14. B
15. electron, proton, neutron
16. B
17. C
18. A
19. C
20. D
21. C
22. $^{226}_{88}\text{Ra}$
23. D
24. C
25. D
26. E
27. B
28. A
29. C
30. C
31. E
32. B

33. A
34. C
35. C
36. C
37. A
38. C
39. A
40. D
41. E
42. B
43. D
44. B
45. B
46. D
47. B
48. E
49. C
50. A
51. B
52. D
53. E
54. A
55. D
56. B
57. B
58. E
59. B
60. C
61. D
62. E
63. A
64. A
65. D
66. A
67. A
68. E
69. A
70. B
71. B
72. C
73. B
74. B
75. C
76. D
77. B
78. ..
H — I ..
79. ..
..
H — Te :
|
H
80. : C ≡ O :
81. A, C
82. C
83. A
84. C
85. B
86. A
87. C
88. E
89. B
90. C
91. D

Pick the TOP five questions you would like Mrs. Farmer to try and do in class under the document camera.

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Go to the following link and submit these questions to the online form so Mrs. Farmer knows which ones you would like her to do!

1st Period:
<https://www.surveymonkey.com/r/FPTM9M2>

2nd Period:
<https://www.surveymonkey.com/r/F6N3CL6>

3rd Period:
<https://www.surveymonkey.com/r/FZ7ZJQP>

4th Period:
<https://www.surveymonkey.com/r/FZR9GNN>

5th Period:
<https://www.surveymonkey.com/r/FZ6T2PT>

6th Period:
<https://www.surveymonkey.com/r/F57LFDN>