

Chemistry 100 Practice Final Exam

Instructions:

Do not begin the exam until you have been instructed to do so. You have 120 minutes to complete this exam.

There are 50 multiple choice questions.

You must use a number 2 pencil.

You may use a scientific calculator.

Make sure that you have written your name legibly on the scantron form.

Circle bubbles on the scantron form as best as you can.

Answer all 50 questions.

If you cannot find an answer on the exam that you expected to see then answer the question as best as you can.

Attached to the end of this exam are tables of SI prefixes, atomic numbers and masses, as well as the periodic table.

Pick the BEST choice for each question.

Good Luck.

Print Name: _____

Signature: _____

1. Which of the following is an element?

- A) salt
- B) silicon
- C) ammonia
- D) carbon monoxide

2. Which of the following is a compound?

- A) limestone
- B) astatine
- C) lithium
- D) gold

3. Which of the following is a chemical property?

- A) Water boils below 100°C on top of a mountain.
- B) Lead is denser than aluminum
- C) Oxygen gas supports combustion
- D) Nitrogen is a gas at room temperature

4. What is the atomic weight of krypton?

- A) 39.10
- B) 83.80
- C) 132.9
- D) 78

5. What is the molar mass of Fe_2O_3 ?

- A) 21.85
- B) 87.85
- C) 127.7
- D) 159.7

6. What is 356 expressed in scientific notation?

- A) 35.6×10^1
- B) 3.56×10^2
- C) 3.56×10^3
- D) 3.56×10^{-2}

7. What is 1.78×10^{-2} expressed as a decimal?

- A) 0.0178
- B) 0.178
- C) 178
- D) 1780

8. The number 9.0652 rounded to three significant figures is

- A) 9.00
- B) 9.07
- C) 9.05
- D) 9.06

9. For which of the following calculations is 1.80×10^{-2} the correct answer?

- A) $653 / (5.75 \times 10^{-8})$
- B) $850,000 - (9.0 \times 10^5)$
- C) $0.0095 + (8.5 \times 10^{-3})$
- D) $(3.63 \times 10^{-4}) \times (3.6 \times 10^6)$

10. Which of the following measurements has seven significant figures?

- A) 48007 mi
- B) 0.05000000 mL
- C) 60,1040 ton
- D) 0.000003 cm

11. Calculate the percent composition by mass of S in sulfuric acid, H_2SO_4

- A) 48%
- B) 3%
- C) 100%
- D) 78%

12. What is the mass in grams of 1 mole of N_2 ?

- A) 14.01
- B) 22.99
- C) 28.02
- D) 45.98

13. How many protons are there in the nucleus of cadmium-112?

- A) 112
- B) 40
- C) 72
- D) 48

14. What is the molecular mass of a $(\text{NH}_2)_2\text{CO}$.

- A) 58.02 g/mol
- B) 60.02 g/mol
- C) 43.02 g/mol
- D) 44.02 g/mol

15. How many neutrons are in the nucleus of a tin -118?

- A) 118
- B) 58
- C) 50
- D) 68

16. Name the Al_2O_3 ?

- A) dialuminum trioxide
- B) aluminum oxide
- C) aluminum (III) oxide
- D) aluminum (II) oxide

17. 356K equals _____ TK = TC + 273

- A) 83C
- B) -83C
- C) 629C
- D) 1.30C

18. Which of the following masses has the highest precision?

- A) 900.075
- B) 8400.00
- C) 68.0088
- D) 0.00004

19. What is the total number of atoms in 2.70 moles of aluminum ($N_A = 6.023 \times 10^{23}$)

- A) 1.63×10^{24}
- B) 1.62×10^{25}
- C) 6.023×10^{23}
- D) 1.63×10^{-24}

20. How many moles are in 25.8g of sodium?

- A) 593.1 mol
- B) 1.12 mol
- C) 1.55×10^{25} mol
- D) 4.28×10^{-23} mol

21. The atomic mass is defined as _____?

- A) the amount of a substance that contains as many elementary entities as there are atoms in exactly 12g of the N-14 isotope.
- B) a mass exactly equal to one-twelfth the mass of one C-12 atom.
- C) a mass of 1mole of units of a substance.
- D) the amount of a substance that contains as many elementary entities as there are atoms in exactly 12g of the C-12 isotope.

22. What is the mass in grams of 2.76×10^{17} atoms of calcium?

- A) 10.81g
- B) 6.66×10^{42} g
- C) 1.84×10^{-5} g
- D) 4.15×10^{-39}

23. The elements in the Group 2A of the periodic table are known as

- A) Noble gases
- B) alkali earth metals
- C) halogens
- D) alkaline earth metals

E) alkali metals

24. Convert 556mL to quarts (1L = 1.06qt)

A) 5.89×10^{-1} qt

B) 5.89×10^5 qt

C) 0.556 qt

D) 556000 qt

25. The average speed of helium gas at room temperature is 1255 m/s. Convert this speed to miles per hour (mph).

A) 0.0002166 mph

B) 2807 mph

C) 561.0 mph

D) 869600 mph

26. Which of the following has a greater mass: 3.0115×10^{24} atoms of hydrogen or 2 moles of nickel?

A) 2 mole of nickel

B) 3.0115×10^{24} atoms of hydrogen

C) Both the same

27. A can beverage contains 2.8L of liquid. How many nanoliters is this?

A) 1.4×10^{-8} nL

B) 1.4 nL

C) 2.8×10^{-9} nL

D) 2.8×10^9 nL

28. How many neutrons are in the nucleus of rubidium-85 atom?

A) 85

B) 37

C) 48

D) 122

29. Which is the correct formula of sodium oxide?

A) NaO

B) NaO₂

C) Na₂O

D) Na₂O₂

30. The chemical name for ClO₃⁻ is "chlorate ion". Therefore, the name of HClO₃

A) perchloric acid

B) chloric acid

C) chlorous acid

D) hypochlorous acid

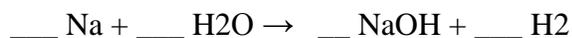
31. What is the number electrons in the nucleus of the Fe^{2+}
- A) 26
 - B) 28
 - C) 2
 - D) 24
32. How many electrons are present in a silver atom?
- A) 47
 - B) 107
 - C) 108
 - D) 60
33. What is the correct formula for magnesium permanganate?
- A) MgCrO_4
 - B) $\text{Mg}(\text{MnO}_4)_2$
 - C) $\text{Mg}(\text{MgO}_4)_2$
 - D) MgMnO_4
34. The mass of a table is actually 12.78 kg. A student makes several measurements to determine the mass of the table. Which of the following measurements is the most accurate?
- A) 13kg
 - B) 12.70kg
 - C) 12.80kg
 - D) 12.90kg
35. An atom of the isotope bromine-80 consists of how many protons (p), neutrons (n), and electrons (e)?
- A) 45p, 35n, 45e
 - B) 45p, 45n, 35e
 - C) 35p, 45n, 35e
 - D) 35p, 35n, 45e
36. Given the 20 electrons, 20 protons, and 20 neutrons in one of which atoms?
- A) chlorine-37
 - B) rubidium-85
 - C) calcium-20
 - D) chlorine-35
37. Condensation refers to which conversion?
- A) solid to gas
 - B) liquid to gas
 - C) solid to liquid
 - D) gas to liquid

38. How many moles are in 67g of gold?
A) 0.34 mol
B) 13199 mol
C) 7169 mol
D) 0.63 mol
39. The mass of 1.63×10^{21} silicon atoms is
A) 2.71×10^{-23} g
B) 4.58×10^{22} g
C) 28.08 g
D) 7.60×10^{-2} g
40. How many silicon atoms are there in 1.00g of silicon?
A) 1 atom
B) 0.0356 atoms
C) 2.57×10^{23} atoms
D) 2.14×10^{22} atoms
41. Calculate the number of moles of xenon in 12.0g of xenon.
A) 1.00 mol
B) 0.0457 mol
C) 0.0914 mol
D) 7.62×10^{-3} mol
42. Calculate the molecular mass of potassium permanganate, KMnO_4 .
A) 52 amu
B) 70 amu
C) 110 amu
D) 158 amu
43. Calculate the mass of 3.00 moles of CF_2Cl_2 .
A) 3.00 g
B) 174 g
C) 363 g
D) 1.81×10^{24} g
44. How many molecules are there in 8.0 g of ozone, O_3 ?
A) 3 molecules
B) 3.6×10^{24} molecules
C) 1.0×10^{23} molecules
D) 3.0×10^{23} molecules
45. How many sulfur atoms are there in 21.0 g of Al_2S_3 ?
A) 8.42×10^{22} atoms
B) 2.53×10^{23} atoms
C) 2.14×10^{23} atoms
D) 6.02×10^{26} atoms

46. A compound was discovered whose composition by mass is 85.6% C and 14.4% H. Which of these choices could be the molecular formula of this compound?

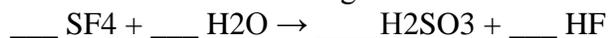
- A) CH₄
- B) C₂H₄
- C) C₃H₄
- D) C₂H₆

47. What is the coefficient of H₂O when the following equation is properly balanced with the smallest set of whole numbers?



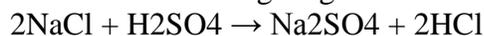
- A) 1
- B) 2
- C) 3
- D) 4

48. Balance the following equation using the smallest set of whole numbers, then add together the coefficients. Don't forget to count coefficients of one.



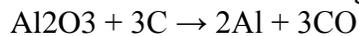
- A) 4
- B) 9
- C) 6
- D) 7

49. When 22.0 g NaCl and 21.0 g H₂SO₄ are mixed and react according to the equation below, which is the limiting reagent?



- A) NaCl
- B) H₂SO₄
- C) Na₂SO₄
- D) No reagent is limiting

50. What is the theoretical yield of aluminum that can be produced by reaction of 60.0 g of aluminum oxide with 30.0 g of carbon according to the following chemical equation?



- A) 30.0 g
- B) 31.8 g
- C) 101.2 g
- D) 45.9 g