Deep Run High School

CHEMISTRY I: 3(A), 5(A), 7(A)

Unit 3 Quiz

Due Date: **October 22, 2019**

Instructors: **Jennifer Krug, Mr. Wilson**

ID: **4924**

Name: _____ Score: / 100

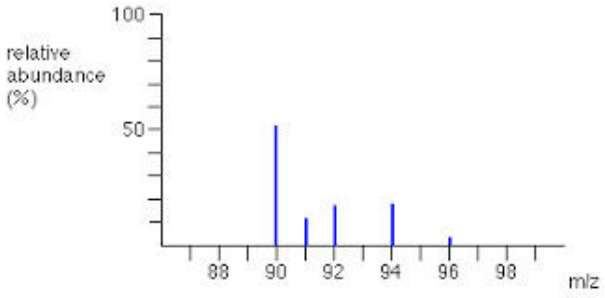
Question 1 /1

Which of the following statements is correct about the structure of an atom?

- ☐ Protons and neutrons are the smallest subatomic particles.
- ☐ Electrons are 2000 times smaller than protons.
- ☐ Neutrons orbit the nucleus of the atom in different orbitals.
- ☐ The nucleus is mostly empty space.

Question 2 /1

The mass spectrum of which element is shown below?



- ☐ Pa
- ☐ Th
- ☐ U
- ☐ Pu
- ☐ Zr

Name: _____

Question 3 /1

The atomic number of an isotope is equal to the number of ___ inside the atom?

- ☐ electrons
- ☐ orbitals
- ☐ neutrons
- ☐ protons

Name: _____

Question 4 /1

The density of a metal was calculated three separate times and recorded below:

Trial #	Concentration of HCl
1	5.23 g/ml
2	4.96 g/ml
3	6.99 g/ml

The actual expected density was 5.00 g/ml. The results were

- ☐ neither accurate nor precise
- ☐ both accurate and precise
- ☐ accurate but not precise
- ☐ precise but not accurate

Name: _____

Question 5 /1

Aristotle assumed the universe was made of earth, wind, air, and fire. Which Greek philosopher disagreed and said the universe was made of "atomos"?

- ☐ Rutherford
- ☐ Democritus
- ☐ Bohr
- ☐ Dalton

Question 6 /1

_____ is a characteristic of a substance that is observed during a reaction in which the composition or identity of the substance is changed.

- ☐ a chemical property.
- ☐ a physical property.
- ☐ a chemical reaction.
- ☐ exothermic reaction.

Name: _____

Question 7 /1

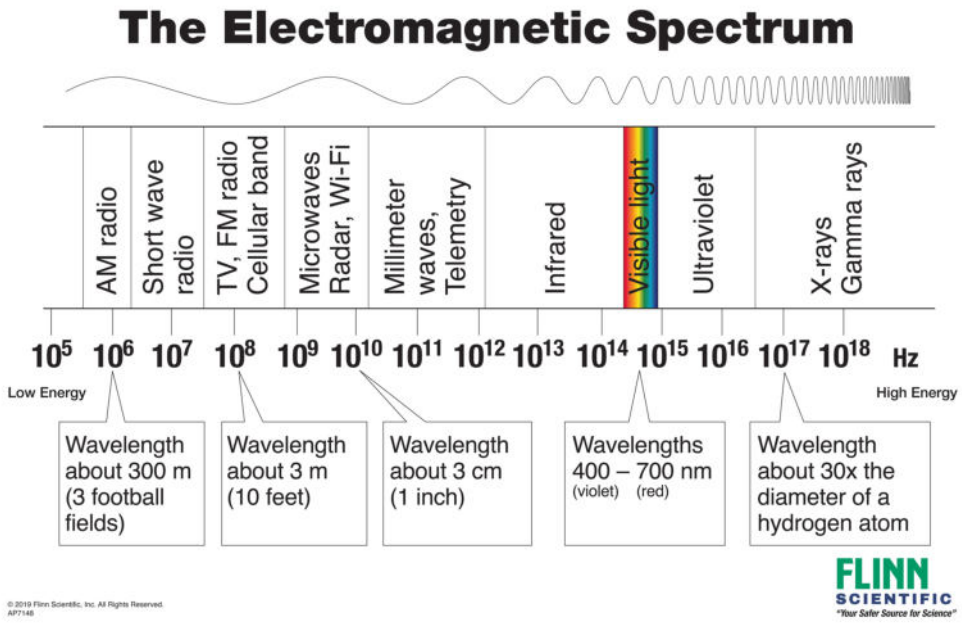
Which of the following scientist proved the existence of neutrons?

- [ ] Neils Bohr
- [ ] Robert Millikan
- [ ] Ernest Rutherford
- [ ] James Chadwick

Name: _____

Question 8 /1

According to the Electromagnetic Spectrum, frequency and wavelength are



- ☐ constant.
- ☐ inversely proportional.
- ☐ directly proportional.

Name: _____

Question 9 /1

Calculate the average atomic mass for *magnesium* based on the information in the table below:

Isotope	Percent Abundance	Relative mass
^{24}Mg	78.70%	23.985 amu
^{25}Mg	10.13%	24.986 amu
^{26}Mg	11.17%	25.983 amu

- ☐ 24.98 amu
- ☐ 23.98 amu
- ☐ 24.31 amu
- ☐ 24.00 amu

Question 10 /1

Which American physicist discovered the charge of the electron in 1910, using the Oil Drop experiment?

- ☐ Robert Millikan
- ☐ Henry Moseley
- ☐ James Chadwick
- ☐ Dmitri Mendeleev

Name: _____

Question 11 /1

Neils Bohr is noticed that the emission spectrum of a hydrogen atom emitted only a few wavelengths of light. He used this to prove that

- ☐ the volume of an atom is mostly empty space.
- ☐ the nucleus contains positive and neutral particles.
- ☐ the electrons orbit the nucleus in discrete orbitals.
- ☐ the protons are located in the nucleus.

Question 12 /1

In 1924, the French physicist, Louis de Broglie suggested that electrons travel in waves or probably clouds called orbitals. What was the name of his atomic model?

- ☐ Solid Ball Model
- ☐ Quantum Mechanical Model
- ☐ Plum Pudding Model
- ☐ Planetary Model

Name: _____

Question 13 /1

Enter the proper number of significant figures into the first box. The second box is for the exponent.

Infrared waves can be seen if you look down at the road on a hot day. They heat the air and cause it to refract or bend the light. If the frequency of the infrared waves is 9.75 X 10^{13} Hz, calculate the energy using Plank's constant. E = hv (Plank's constant, h = 6.626 x 10^{-34} m^2 kg/s)

Energy of Infrared waves = _____ x 10 _____ Joules

Question 14 /1

Which of the following statements was part of the First Atomic Theory of Matter?

- ☐ Atoms are composed of protons, neutrons, and electrons.
- ☐ Atoms of different elements combine to form compounds.
- ☐ Atoms contain both positive and negative charges.
- ☐ Atoms have a dense positive nucleus and are mostly empty space.

Name: _____

Question 15 /1

The mass number of an isotope is equal to the number of ___ inside the atom?

- ☐ neutrons and electrons
- ☐ electrons and orbitals
- ☐ protons and neutrons
- ☐ electrons and protons

Question 16 /1

Which of the following is the correct isotopic notation for an atom containing 19 protons and 20 neutrons?

- ☐ $^{39}_{20}K$
- ☐ $^{20}_{19}K$
- ☐ $^{39}_{19}K$
- ☐ $^{19}_{20}K$

Name: _____

Question 17 /1

An atom of argon has a mass number of 41. How many neutrons does it have?

- ☐ 41
- ☐ 22
- ☐ 23
- ☐ 36
- ☐ 18

Question 18 /1

A characteristic of a pure substance that can be observed without changing it into another substance is −

- ☐ exothermic reaction.
- ☐ a chemical property.
- ☐ a chemical reaction.
- ☐ a physical property.

Name: _____

Question 19 /1

Which of the following contains a **homogeneous mixture**?

- [ ] A glass of Dr. Pepper with ice
- [ ] A bowl of sugar
- [ ] A balloon full of air
- [ ] A lava lamp

Question 20 /1

Which of the following scientists performed the Cathode Ray Experiment?

- [ ] John Dalton
- [ ] J. J. Thompson
- [ ] Ernest Rutherford
- [ ] James Chadwick

Name: _____

Question 21 /1

An isotope that has an atomic number of 10 and a mass number of 22 would belong to which element?

- ☐ Titanium
- ☐ Sodium
- ☐ Nickel
- ☐ Neon

Question 22 /1

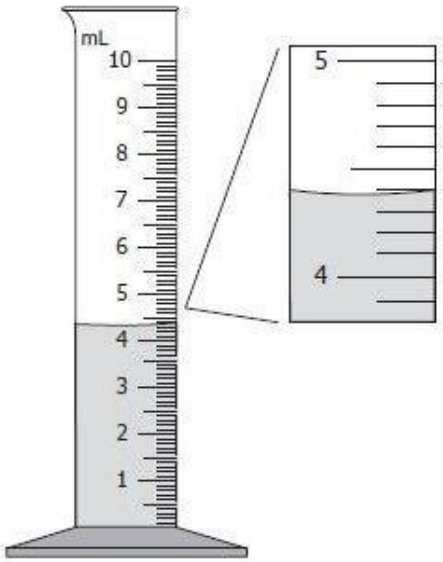
How many neutrons are present in an isotope of ^{77}Br? (atomic # 35)

- ☐ 112
- ☐ 77
- ☐ 42
- ☐ 35

Name: _____

Question 23 /1

What is the volume of the water in this graduated cylinder?

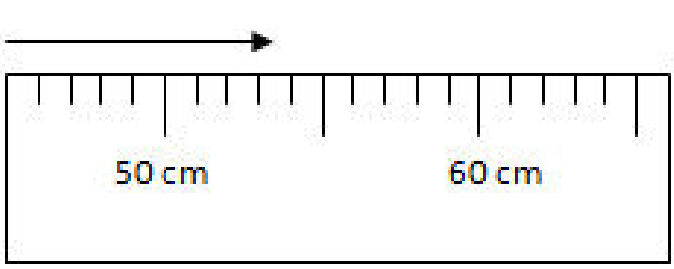


- [ ] 5.61 ml
- [ ] 4.40 ml
- [ ] 4.04 ml
- [ ] 4.39 ml

Name: _____

Question 24 /1

Use the diagram below to answer this question:



Record the length of the arrow to the correct number of significant digits:

- [ ] 50.30 cm
- [ ] 53.50 cm
- [ ] 50.3 cm
- [ ] 53.5 cm

Name: _____

Question 25 /1

Which of the following was theorized after performing the Gold Foil Experiment?

- ☐ Electrons orbit the empty space around the dense positive nucleus.
- ☐ Electrons are negatively charged subatomic particles.
- ☐ Electrons move in wave patterns around the nucleus.
- ☐ Electrons occupy different energy levels orbiting the nucleus.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Instructions for grading: Grade each question and tally the score to obtain the total test points. If the factor does not equal 1, multiply the total points by the factor to obtain the student's final score.

Question 1

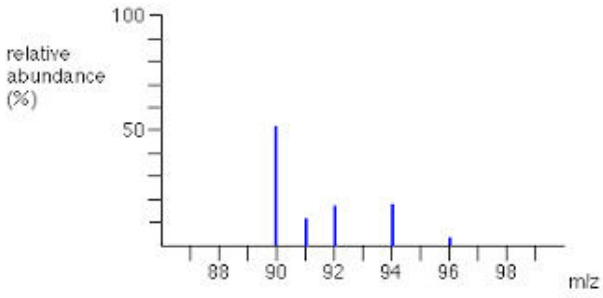
Which of the following statements is correct about the structure of an atom?

☑ Electrons are 2000 times smaller than protons.

1 possible pts.

Question 2

The mass spectrum of which element is shown below?



☑ Zr

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Question 3

The atomic number of an isotope is equal to the number of ___ inside the atom?

☑ protons

1 possible pts.

Question 4

The density of a metal was calculated three separate times and recorded below:

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Question 5

Aristotle assumed the universe was made of earth, wind, air, and fire. Which Greek philosopher disagreed and said the universe was made of "atomos"?

☑ Democritus

1 possible pts.

Question 6

_____ is a characteristic of a substance that is observed during a reaction in which the composition or identity of the substance is changed.

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1 possible pts.

Question 7

Which of the following scientist proved the existence of neutrons?

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1 possible pts.

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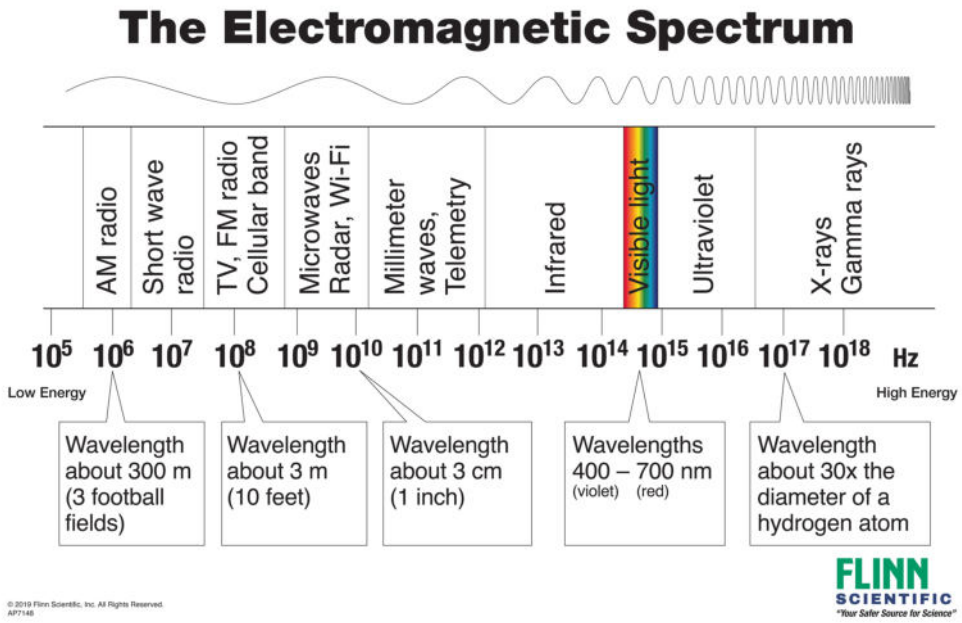

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Question 10

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☑ Robert Millikan

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☑ the electrons orbit the nucleus in discrete orbitals.

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Question 12

In 1924, the French physicist, Louis de Broglie suggested that electrons travel in waves or probably clouds called orbitals. What was the name of his atomic model?

☑ Quantum Mechanical Model

1 possible pts.

Answer Key

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Question 13

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Energy of Infrared waves = 6.46 **x 10** -20 **Joules**

1 possible pts.

Question 14

Which of the following statements was part of the First Atomic Theory of Matter?

☑ Atoms of different elements combine to form compounds.

1 possible pts.

Answer Key

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Question 15

The mass number of an isotope is equal to the number of ___ inside the atom?

☑ protons and neutrons

1 possible pts.

Question 16

Which of the following is the correct isotopic notation for an atom containing 19 protons and 20 neutrons?

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Question 17

An atom of argon has a mass number of 41. How many neutrons does it have?

☑ 23

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Answer Key

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Question 18

A characteristic of a pure substance that can be observed without changing it into another substance is –

☑ a physical property.

1 possible pts.

Question 19

Which of the following contains a **homogeneous mixture**?

☑ A balloon full of air

1 possible pts.

Question 20

Which of the following scientists performed the Cathode Ray Experiment?

☑ J. J. Thompson

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Question 21

An isotope that has an atomic number of 10 and a mass number of 22 would belong to which element?

☑ Neon

1 possible pts.

Question 22

How many neutrons are present in an isotope of ^{77}Br? (atomic # 35)

☑ 42

1 possible pts.

Answer Key

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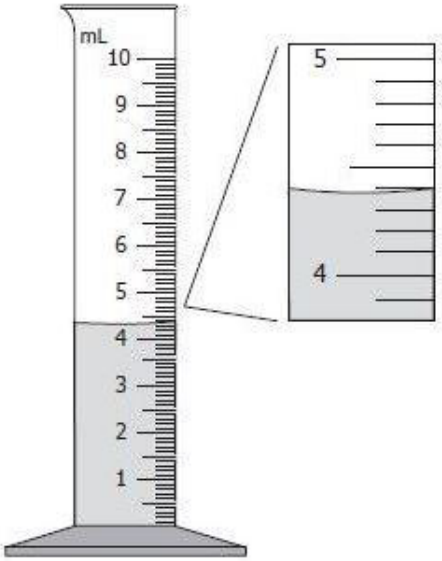
Question 23

What is the volume of the water in this graduated cylinder?



☑ 4.39 ml

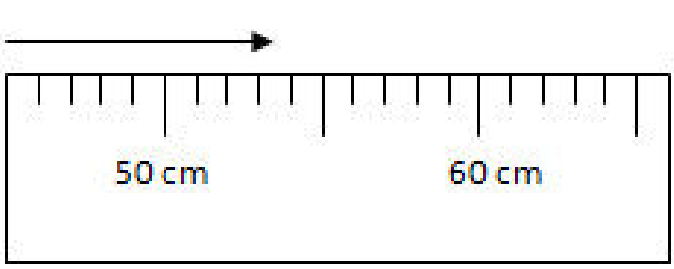
1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Question 24

Use the diagram below to answer this question:



Record the length of the arrow to the correct number of significant digits:

☑ 53.5 cm

1 possible pts.

Question 25

Which of the following was theorized after performing the Gold Foil Experiment?

☑ Electrons orbit the empty space around the dense positive nucleus.

1 possible pts.