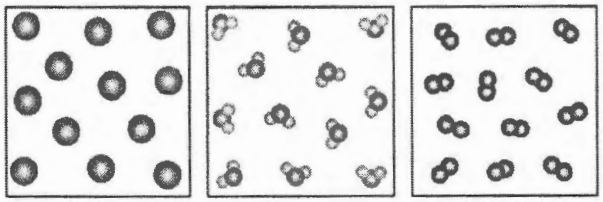
Chem 111 Spring 2017 Name: Answer Key (A)

5 **1.** Identify the substance in each box as an element or a compound. Spheres of different colors represent atoms of different elements.



Element	Element	Element
Compound	Compound	Compound

5 **2.** Identify each as homogeneous or heterogeneous.

a. pure air homogeneous or heterogeneous

b. raisin cookie homogeneous or heterogeneous

4 **3.** How many significant figures in each of the following:

a. 0.00254 3 b. 100.45 5

6 **4.** If 35.0 g of a liquid has a volume of 39.6 mL, what is the density of the liquid? 0.884 g/mL

6 **5.** Indicate the components of an atom with this symbol: $^{32}_{15}X$

15 protons 15 electrons 17 neutrons What element does X represent? P

The molecules O_2 and O_3 represent: isomers isotope allotropes polytropes

6 **6.** The **size** of an atom depends mostly on: (choose all correct answers)

number of protons number of neutrons size of electron cloud

The **mass** of an atom depends mostly on: (choose all correct answers)

number of protons number of neutrons size of electron cloud

32

6

7. Two different isotopes of an element have the same number of: (protons) (electrons) neutrons

(choose all correct answers)

9

8. What element is in the 4th period of Group 5A of the periodic table? As, arsenic

What element is in the 3rd period of the halogens? Cl, chlorine

Consider the periodic table. Most elements are: nonmetals (metals) metalloids

Calculation Problems: Show your work

10

9. How many hours are there in 14 weeks?

$$14 \text{ weeks} \times \frac{7 \text{ days}}{1 \text{ week}} \times \frac{24 \text{ hours}}{1 \text{ day}} = 2352 \text{ hours}$$

2400 hours

10

10. What is the distance 3.68 miles in units of meters? 1 kilometer = 0.621 miles

$$3.68 \text{ miles} \times \frac{1 \text{ km}}{0.621 \text{ miles}} \times \frac{1000 \text{ m}}{1 \text{ km}} = 5926 \text{ m}$$

5930 m

10

11. An element is composed of three isotopes with the following percent abundancies and masses. What is the average atomic weight of this element?

	Mass	% abundance
Isotope 1	76.0 amu	22.0 %
Isotope 2	78.0 amu	12.5 %
Isotope 3	80.0 amu	65.5 %

$$\text{Average} = 0.22 \times 76.0 + 0.125 \times 78.0 + 0.655 \times 80.0 = 78.87 \text{ amu}$$

78.9 amu

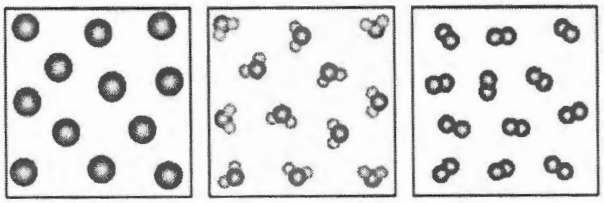
45

77

Chem 111 Spring 2017 Name: Answer Key

B

5 **1.** Identify the substance in each box as an element or a compound. Spheres of different colors represent atoms of different elements.



Compound	Compound	Compound
Element	Element	Element

5 **2.** Identify each as homogeneous or heterogeneous.

a. raisin cookie homogeneous or heterogeneous

b. pure air homogeneous or heterogeneous

4 **3.** How many significant figures in each of the following:

a. 0.0254 3 b. 10.45 4

6 **4.** If 25.0 g of a liquid has a volume of 42.6 mL, what is the density of the liquid? 0.587 g/mL

6 **5.** Indicate the components of an atom with this symbol: $^{32}_{15}X$

15 protons 15 electrons 17 neutrons What element does X represent? P

The molecules O_2 and O_3 represent: isomers isotope allotropes polytropes

6 **6.** The **mass** of an atom depends mostly on: (choose all correct answers)

number of protons number of neutrons size of electron cloud

The **size** of an atom depends mostly on: (choose all correct answers)

number of protons number of neutrons size of electron cloud

32

(B)

6 **7.** Two different isotopes of an element have the same number of: protons electrons neutrons

(choose all correct answers)

9 **8.** What element is in the 3th period of Group 6A of the periodic table? S, sulfur

What element is in the 4rd period of the halogens? Br, bromine

Consider the periodic table. Most elements are: nonmetals metals metalloids

Calculation Problems: Show your work

10 **9.** How many hours are there in 16 weeks?

$$16\text{ weeks} \times \frac{7\text{ days}}{1\text{ week}} \times \frac{24\text{ hours}}{1\text{ day}} = 2688\text{ hours}$$

2700 hours

10 **10.** What is the distance 4.28 miles in units of meters? 1 kilometer = 0.621 miles

$$4.28\text{ miles} \times \frac{1\text{ km}}{0.621\text{ miles}} \times \frac{1000\text{ m}}{1\text{ km}} = 6892\text{ m}$$

6890 m

10 **11.** An element is composed of three isotopes with the following percent abundancies and masses. What is the average atomic weight of this element?

	Mass	% abundance
Isotope 1	62.0 amu	22.0 %
Isotope 2	64.0 amu	12.5 %
Isotope 3	66.0 amu	65.5 %

$$0.220 \times 62.0\text{ amu} + 0.125 \times 64.0\text{ amu} + 0.655 \times 66.0\text{ amu} = 64.87\text{ amu}$$

64.9 amu

45