midterm review (Homework)

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1.
What does the metric prefix milli mean?

2.
How many kilometers are in 6,250,000.0 centimeters?

3.
Express 5,981,025,000 in exponential form using standard scientific or "e" notation (for example, 105 = 1.05e2). Enter the correct number of significant figures.

4.
Convert 709.5 meters to centimeters.

5.
The concept of ____ indicates the ability of a person to measure consistently.

6.
The concept of ____ indicates how close the experimental answer is to the true value.

7.
Select the correct number of significant figures for .00698.

8.
How many significant zeros are in .0650030?

9.
Calculate the value of the following in exponential form, using standard scientific or "e" notation (for example, 105 = 1.05e2). Enter the correct number of significant figures.
235.15 cm + 9.2 cm + 35.111 cm

10.
Calculate the value of the following in exponential form, using standard scientific or "e" notation (for example, 105 = 1.05e2). Enter the correct number of significant figures.
(2.50e2 cm)(3.555e-4 cm)

11.
Convert 40.5°C to K. Enter the correct number of significant figures.

12.
Select the correct number of significant figures for 0.00007 g of radium.

13.
Classify the following as homogenous mixtures, heterogenous mixtures, elements or compounds.
(a) magnesium oxide

(b) salad dressing

(c) water

(d) iron

(e) salt water

14.
Which elements are characterized by the filling of *d* orbitals?

15.
What is a horizontal row of elements in the periodic table called?

16.
To which family do sodium and potassium belong?

17.
To which family do argon and helium belong?

18.
Which element has similar properties to chlorine?

19.
What is the formula for potassium carbonate?

20.
What is the formula for calcium hydroxide?

21.
What is the formula for magnesium phosphate?

22.
What is the formula for copper (I) sulfate?

23.
What is the formula for aluminum phosphate?

24.
What is the formula for lithium oxide?

25.
What is the formula for carbon tetrachloride?

26.
What is the formula for iron (III) oxide?

27.
Potassium chlorate is a rich source of oxygen. It decomposes upon heating to produce potassium chloride and oxygen. Which of the following represents the correctly balanced equation for this reaction?

28.
Identify the elements having the electron configurations below. Write the symbol for the element. You may use the Periodic Table.
$[Ne]3s^23p^2$
$[Ar]4s^23d^8$
$1s^22s^22p^63s^23p^64s^23d^2$
$1s^22s^22p^63s^23p^64s^23d^{10}4p^6$

29.
What is the charge and mass in amu of a proton?

30.
Indicate the numbers of protons and neutrons in the following atoms.
(a) ^{238}U
(b) ^{33}P
(c) ^{65}Cu
(d) ^{15}O

31.
How many valence electrons are found in an atom of N?

32.
How many valence electrons are found in an atom of P?

33.
How do electrons change when atoms absorb light energy?

34.
Which electron configuration cannot exist?

35.
Different isotopes of the same element have different numbers of what?

36.
Which subatomic particle(s) make(s) up most of the mass of an atom?

37.
Which orbital filling diagram is correct for the $2p$ subshell of nitrogen?

38.
J.J. Thomson was experimenting with the cathode ray tube and observed that the rays were attracted to a positively charged plate. He is credited with the discovery of which of the following?

39.
How many orbitals are contained in the $3s$ sublevel?

40.
Bromine consists of two major isotopes with the following percent abundances and atomic masses: ^{79}Br (50.54% and 78.918 amu) and ^{81}Br (49.46% and 80.916 amu). Calculate the average atomic mass of bromine.

41.
Silver consists of two major isotopes with the following percent abundances and atomic masses: ^{107}Ag (51.84% and 106.90509 amu) and ^{109}Ag (48.16% and 108.90476 amu). Calculate the average atomic mass of silver.

42.
25 g of a radioactive substance is left after 16 days of decay. What is the half life of the substance if the original sample had a mass of 100 g?

43.
How many orbitals and electrons are in each of the following sublevels?

	orbitals	electrons
s sublevel		
p sublevel		
d sublevel		
f sublevel		

44.
Enter the symbol for the element represented by each of the following ground state configurations for the neutral atom.
$1s^2 2s^2 2p^6 3s^2 3p^2$
$[Rn]7s^1$
$[Ar]4s^2 3d^{10} 4p^5$
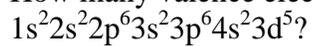$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
$1s^2 2s^2 2p^6 3s^2 3p^6$

45.
What is the correct arrangement of the electron spins in a $2p^4$ sublevel? (Select all that apply.)

46.

How many valence electrons are in an atom having the electron configuartion
$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$?

47.

When you are determining the amount of heat energy necessary to melt 10 g of ice at 0°C, which of the following values do you need to complete the calculation?

48.

Copper has a specific heat of 0.387 J/g·°C. How much energy is required to raise the temperature of 180. g of copper from 40.5°C to 169.0°C?