Test 2A Matter, Atoms, and the Mole (100 Points)

Multiple Choice:  Read the question carefully. There is only one correct answer (3 points each).
1. The sum of protons and neutrons in the nucleus is called the
   a. atomic number.  
   b. mass number. 
   c. mass weight.  
   d. atomic weight.  
2. The amount of space an object takes up is its 
   a. volume.  
   b. density.  
   c. mass.  
   d. weight.  
3. A force of attraction of all objects on all other objects is called 
   a. electromagnetic force.  
   b. strong force. 
   c. weak force.  
   d. gravity.  
4. An example of a physical change is 
   a. baking a cake.  
   b. breaking a glass.  
   c. reacting sodium with chlorine.  
   d. burning wood.  
5. The triple-beam balance is used for measuring the 
   a. mass of solid objects.  
   b. volume of liquids.  
   c. dimensions of solid objects.  
   d. all of the above.  
6. A graduated cylinder measures the volume of both liquid and irregular objects. Objects are measured in  
   a. millimeters.  
   b. milliliters.  
   c. centigrams.  
   d. centiliters.  
7. Molybdenum has an atomic number of 42 and an atomic mass of 95.94 u. How many electrons does it have? 
   a. 42  
   b. 54  
   c. 53  
   d. 43  
8. A measurement is said to have good precision if it 
   a. agrees closely with an accepted standard.  
   b. agrees closely with similar measurements. 
   c. has a small number of significant figures.  
   d. has a large number of significant figures.  
9. An example of a chemical change is 
   a. burning paper.  
   b. dissolving sugar in tea.  
   c. mixing alcohol and water.  
   d. melting ice.  
10. The basic unit of volume in the metric system is the  
   a. meter.  
   b. kilogram.  
   c. liter.  
   d. cubic centimeters.
11. The simplest pure substances that cannot be broken down into any simpler substances by heating or chemical reactions are called
   a. compounds.   b. molecules.
   c. elements.   d. bonds.

12. Iodine has an atomic number of 53 and an atomic mass of 124.905 u. How many neutrons does it have?
   a. 53   b. 72
   c. 71   d. 52

13. All liquids have
   a. definite shape and definite volume.   b. no definite shape, but definite volume.
   c. no definite shape or definite volume.   d. definite shape, but no definite volume.

Short Answer questions: Please fill in the blanks with the most appropriate answer. Write the units where needed. Each question is worth 2 points.

14. The standard for atomic mass is ____________________________.

15. ____________________________ is the process by which moisture forms on the outside of a cold glass.

16. Give one of the indications of chemical change. ______________________________
    __________________________________________________________________________

17. The mass number of an electron is ___________________ u.

18. A mixture that does not appear to be the same throughout is called ________________________.

19. There are ________________ centimeters in a meter stick.

20. There are ________________ grams and ________________ milligrams in a kilogram.

21. A rectangular block of wood is measured with a metric ruler. Its dimensions are 12.50cm, 9.65cm, and 3.0cm. What is its volume? _________________________

22. Cheney Lake’s water level has dropped several feet due to the unusually dry Kansas summer. This is due to the phase called ________________________.

Definitions: Each definition is worth 2 points. Be specific.

23. gram atomic weight: ________________________________
    __________________________________________________________________________

24. atomic number: ________________________________
    __________________________________________________________________________

Using a periodic table determine: Each worth 2 points
25. atomic number of Zn ________  
26. number electrons in Ar _____
27. atomic mass of Cl __________  
28. mass number of Fe _______
29. number neutrons in Pt _____  
30. gram atomic weight of Ni _____

Calculations: Calculate the correct answer to the correct significant figure. Please show your work. Each problem is worth 3 points.

31. \( 5932 \text{ m} = \quad _____ \text{ km} \)

32. Convert \( 1,578,300 \) to scientific notation.

33. How many grams are in 1.00 mole of Li?

34. How many moles are represented by 40.1 g Ca?

35. How many grams are in \( 4.50 \times 10^{15} \) atoms of silicon?

36. How many atoms are in 5.000 moles of silver?

37. How many moles are in 0.56 grams of potassium?
38. An insect masses a total of 300.0mg, .0412g, and .000078kg. What is the combined mass in milligrams?

39. The volume of a rectangle is measured to be 1.70m by 106.0cm by .0004032km. What is its volume in centimeters?
Test 2B Matter, Atoms, and the Mole (100 Points)

Multiple Choice: Read the question carefully. There is only one correct answer (3 points each).

1. A force of attraction of all objects on all other objects is called
   a. electromagnetic force.  
   b. strong force.  
   c. weak force.  
   d. gravity.

2. An example of a physical change is
   a. baking a cake.  
   b. breaking a glass.  
   c. reacting sodium with chlorine.  
   d. burning wood.

3. Molybdenum has an atomic number of 42 and an atomic mass of 95.94 u. How many electrons does it have?
   a. 42  
   b. 53  
   c. 41  
   d. 52

4. A measurement is said to have good precision if it
   a. agrees closely with an accepted standard.  
   b. agrees closely with similar measurements.  
   c. has a small number of significant figures.  
   d. has a large number of significant figures.

5. The simplest pure substances that cannot be broken down into any simpler substances by heating or chemical reactions are called
   a. compounds.  
   b. molecules.  
   c. elements.  
   d. bonds.

6. Iodine has an atomic number of 53 and an atomic mass of 124.905 u. How many neutrons does it have?
   a. 53  
   b. 72  
   c. 71  
   d. 52

7. An example of a chemical change is
   a. burning paper.  
   b. dissolving sugar in tea.  
   c. mixing alcohol and water.  
   d. melting ice.

8. The basic unit of volume in the metric system is the
   a. meter.  
   b. kilogram.  
   c. liter.  
   d. cubic centimeters.

9. The triple-beam balance is used for measuring the
   a. mass of solid objects.  
   b. volume of liquids.  
   c. dimensions of solid objects.  
   d. all of the above.

10. A graduated cylinder measures the volume of both liquid and irregular objects. Objects are measured in
   a. millimeters.  
   b. milliliters.  
   c. centigrams.  
   d. centiliters.
11. All liquids have
   a. definite shape and definite volume.   b. no definite shape, but definite volume.
   c. no definite shape or definite volume.   d. definite shape, but no definite volume.

12. The sum of protons and neutrons in the nucleus is called the
   a. atomic number.   b. mass number.
   c. mass weight.   d. atomic weight.

13. The amount of space an object takes up is its
   a. volume.   b. density.
   c. mass.   d. weight

**Short Answer questions:** Please fill in the blanks with the most appropriate answer. Write the units where needed. Each question is worth 2 points.

14. The relative atomic mass of an electron is ________________________________________

15. ___________________________ is the process by which water changes into water vapor by the addition of heat.

16. Give one of the three indications of chemical change. ________________________________
    ___________________________________________________________________________

17. The charge of a neutron is ________________ .

18. A mixture that does appear to be the same throughout is called ________________.

19. There are ________________ millimeters in a meter stick.

20. A mole equals _____________________________ atoms.

21. There are ________________ grams and ________________ milligrams in 5 kilograms.

22. A rectangular block of wood is measured with a metric ruler. Its dimensions are 19.6cm, 4.350cm, and 8.00cm. What is its volume? _________________________

23. An object has a mass of 50.00g, 850mg and .60g. The total mass of the object is ________________ grams.

**Definitions:** Each definition is worth 2 points. Be specific.

23. mass number: ________________________________________________________________
    ___________________________________________________________________________

24. atomic mass: ________________________________________________________________
    ___________________________________________________________________________
Using a periodic table determine: Each worth 2 points

25. number protons in Cl ________  
26. number electrons in Ne ________

27. number neutrons in Li ________  
28. mass number of Ni ________

29. number neutrons in Au ________  
30. gram atomic weight of Cr ________

Calculations: Calculate the correct answer to these problems. Please show your work. Each problem is worth 3 points.

31. $6471\text{m} = \underline{\quad}\text{km}$

32. Convert to scientific notation $0.000\ 000\ 8910$.

33. How many moles do $3.25 \times 10^5 \text{g Pb}$ represent?

34. How many grams are in $2.57$ moles of S?

35. What is the mass, in grams, of $0.500$ moles of magnesium?

36. How many atoms are in $0.56$ grams of potassium?
37. How many grams are in $4.50 \times 10^{15}$ atoms of silicon?

38. A rodent masses a total of 800.0mg, .090g, and .000064kg. What is the combined mass in milligrams?

39. The volume of a rectangle is measured to be 1.65m by 250.0cm by .00030km. What is its volume in centimeters?
Test 2C Matter, Atoms, and the Mole (100 Points)

**Multiple Choice:** Read the question carefully. There is only one correct answer (3 points each).

1. Molybdenum has an atomic number of 42 and an atomic mass of 95.94 u. How many electrons does it have?
   a. 42  
   b. 53  
   c. 41  
   d. 52

2. A measurement is said to have good precision if it
   a. agrees closely with an accepted standard.  
   b. agrees closely with similar measurements.  
   c. has a small number of significant figures.  
   d. has a large number of significant figures.

3. An example of a chemical change is
   a. burning paper.  
   b. dissolving sugar in tea.  
   c. mixing alcohol and water.  
   d. melting ice.

4. The basic unit of volume in the metric system is the
   a. meter.  
   b. kilogram.  
   c. liter.  
   d. cubic centimeters.

5. The triple-beam balance is used for measuring the
   a. mass of solid objects.  
   b. volume of liquids.  
   c. dimensions of solid objects.  
   d. all of the above.

6. A graduated cylinder measures the volume of both liquid and irregular objects. Objects are measured in
   a. millimeters.  
   b. milliliters.  
   c. centigrams.  
   d. centiliters.

7. The simplest pure substances that cannot be broken down into any simpler substances by heating or chemical reactions are called
   a. compounds.  
   b. molecules.  
   c. elements.  
   d. bonds.

8. Iodine has an atomic number of 53 and an atomic mass of 124.905 u. How many neutrons does it have?
   a. 53  
   b. 72  
   c. 71  
   d. 52

9. All liquids have
   a. definite shape and definite volume.  
   b. no definite shape, but definite volume.  
   c. no definite shape or definite volume.  
   d. definite shape, but no definite volume.

10. The sum of protons and neutrons in the nucleus is called the
    a. atomic number.  
    b. mass number.  
    c. mass weight.  
    d. atomic weight.
11. The amount of space an object takes up is its
   a. volume. b. density. c. mass. d. weight

12. A force of attraction of all objects on all other objects is called
   a. electromagnetic force. b. strong force. c. weak force. d. gravity.

13. An example of a physical change is
   a. baking a cake. b. breaking a glass. c. reacting sodium with chlorine. d. burning wood.

**Short Answer questions:** Please fill in the blanks with the most appropriate answer. Write the units where needed. Each question is worth 2 points.

14. The atomic mass of an electron is ________________ u and the atomic mass of a neutron is ________________u.

15. ______________________ is the process by which solids change into gases by the addition of heat.

16. Give all four indications of chemical change. ________________________________
    _______________________________________________________________________

17. The charge of a neutron is ________________.

18. A heterogeneous mixture appears ________________________________.

19. A meter stick has __________ mm, and __________ cm.

20. $6.02 \times 10^{23}$ is __________________________ number and is the quantity of _________ of atoms.

21. A rectangular block of wood is measured with a metric ruler. Its dimensions are 19.6cm, 4.350cm, and 8.00cm. What is its volume? __________________________

22. An object has a mass of 50.00g, 850mg and .60g. The total mass of the object is ________________________ grams.

**Definitions:** Each definition is worth 2 points. Be specific.

23. atomic number: _____________________________________________________________
    _______________________________________________________________________

24. gram atomic weight: _______________________________________________________
    _______________________________________________________________________

Using a periodic table determine: Each worth 2 points
25. number protons in Rb ________ 26. number electrons in Hg ______
27. number neutrons in Pb ________ 28. mass number of Ag ________
29. number neutrons in Kr ________ 30. gram atomic weight of Co ______

Calculations: Calculate the correct answer to these problems. Please show your work. Each problem is worth 3 points.

31. 9.386m = ___________________ km

32. Convert to scientific notation 0.000 069 760.

____________________________________

33. How many moles are there in 0.0316 g of potassium?

____________________________________

34. How many grams are in 0.918 moles of platinum?

____________________________________

35. What is the mass, in grams, of 1.490 moles of magnesium?

____________________________________

36. How many atoms are in 3.49 grams of manganese?

____________________________________
37. How many grams are in $8.1 \times 10^{18}$ atoms of cesium?

____________________________________

38. A rodent has a total mass of 69.7mg, .196g, and .000018kg. What is the combined mass in milligrams?

____________________________________

39. The volume of a rectangle is measured to be 0.892m by 34.1cm by .00057km. What is its volume in centimeters?

____________________________________