


Celebration of Periodic Trends and Atomic Structure Name: \_\_\_\_\_

30 multiple choice questions, 3 points each. Exam total is 90 points. grade: \_\_\_\_\_/90  
all answers on the answer sheet only.

1. JJ Thompson discovered the  
A. proton                      B. neutron                      C. electron                      D. atom
2. John Dalton described the atom as  
A. a billiard ball                      B. plum pudding                      C. planets                      D. too difficult to grasp
3. Ernest Rutherford shot something at the gold foil in his famous experiment. It was  
A. alpha particles                      B. beta particles                      C. gamma rays                      D. jelly beans
4. Neils Bohr mathematically saved the atom from this problem  
A. protons turning into neutrons over time                      B. electrons staying in their orbits  
C. neutrons escaping the nucleus                      D. protons repelling against each other
5. Edwin Schrodinger used quantum math to explain  
A. why Bohr was right                      B. why Dalton was wrong  
C. why Rutherford's mustache was way too big                      D. where electrons were really found
6. If the first three orbitals of an electron configuration are full, this is correct:  
A. 2 - 8                      B. 2 - 8 - 16                      C. 2 - 8 - 18                      D. 2 - 8 - 7 - 1
7. What element has 41 electrons and 52 neutrons?  
A. tungsten                      B. niobium                      C. gallium                      D. bismuth
- 8.
9. How many electrons are in the highest orbital of arsenic?  
A. one                      B. three                      C. five                      D. seven
10. Which of these statements is CORRECT?  
A. non metals are all found in group 1                      B. transitional metals include P, S, & Te  
C. noble gases can combine with F at STP                      D. alkaline earth metals are in group 2
11. Electrons in the configuration of 2 - 7 - 2 indicate  
A. Na isotope                      B. Na in excited state                      C. Mg cation                      D. Ne anion
12. The modern periodic table has the elements arranged by increasing  
A. atomic number                      B. atomic mass                      C. number of neutrons                      D. electron orbitals
13. Take a wild guess

14. The number of neutrons of any atom can be determined by  
A. knowing the atomic number, which is the number of neutrons  
B. knowing the atomic mass, as neutrons equal the atomic mass  
C. atomic mass minus the atomic number  
D. atomic number minus the number of protons
15. The group for the noble gases is    A. 1    B. 2    C. 17    D. 18
16. Which of these statements is CORRECT?  
A. ions are always smaller than their atoms  
B. cations are always larger than their atoms  
C. atoms are larger than their anions  
D. anions are larger than their atoms
17. As you go down group one  
A. atoms get smaller but ions get bigger  
B. both the atoms and ions get smaller  
C. ions get bigger but atoms get smaller  
D. both the atoms and ions get bigger
18. On your reference table S, the atomic radius is measured in  
A. pico meters                      B. pickle meters    C. millimeters                      D. micrometers
19. The correct atomic radii for boron and sulfur (in order) are:  
A. 37 + 32            B. 98 + 91                      C. 98 + 127                      D. 127 + 97
20. Which of these elements has the highest electro-negativity?  
A. Hydrogen                      B. Carbon                      C. Mercury                      D. Calcium
21. The first 40 elements listed in table S have only four with no electro-negativity value.  
This is because  
A. there is a mistake in the chart  
B. these noble gases cannot conduct electricity  
C. these noble gases do not attract electrons in chemical reactions  
D. their chemical densities are so low that their electro-negativity values are negligible
22. Which has the correct order of elements for increasing first ionization energy levels?  
A. Be, C, Cl, Kr                      B. H, C, Mg, K                      C. Ca, P, Ne, B                      D. Br, Zn, Cr, Ar
23. Which is correct?  
A. Na is larger than  $\text{Na}^+$                       B. Cl is larger than  $\text{Cl}^-$   
C. Rb is larger than Cs                      D. Ga is larger than Al
24. The net charge of all atomic nuclei are  
A. positive            B. negative            C. neutral

25. Going across a period of the periodic table left to right, the net nuclear charge of the atoms
- A. always varies
  - B. always remains the same
  - C. goes down
  - D. goes up
26. When comparing the sizes of ionic radii and atomic radii, which is correct?
- A.  $\text{Br}^- = \text{Br}$
  - B.  $\text{Br} < \text{Br}^-$
  - C.  $\text{Br}^- > \text{Br}$
  - D.  $\text{Br}^+ = \text{Br}^-$
27. Electro-negativity is defined as
- A. radioactive level of particular electrons in chemical reactions
  - B. energy released when losing an electron during a chemical reaction
  - C. tendency to lose electrons in a chemical reaction
  - D. tendency to gain electrons in a chemical reaction
28. First Ionization Energy can be defined as
- A. energy required to add an electron to an outer orbital
  - B. energy required to remove an electron from an outer orbital
  - C. energy required to convert an ion to an atom
  - D. energy required to stretch an outer orbital when an atom becomes an anion
29. Which group or elements do some of our periodic trends break down?
- A. transitional metals
  - B. non-metals
  - C. alkaline earth metals
  - D. noble gases
30. What is the correct electron configuration for potassium in the ground state?
- A. 2 - 8 - 1
  - B. 2 - 8 - 8 - 1
  - C. 2 - 8 - 4
  - D. 2 - 8 - 18 - 8

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**DIRECTIONS:**

**ONLY USE  
A, B, C, and D  
with  
CAPITAL LETTERS.**

**Put all of your  
answers on this sheet.**

**30 questions x 3  
points each = 90  
points total.**

**Name:**

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