NAME KEY PER_____ DATE_____

ATOMIC STRUCTURE PRACTICE TEST #2

1. One of Bohr's contributions to atomic theory is the idea that…
a) the atom has a massive positively charged nucleus.
b) electrons exist in regions of space called orbitals.
c) electrons exist in specific energy levels.
d) neutrons are present in the nucleus.

2. One of Schroedinger's contributions to atomic theory is the idea that…
a) the atom has a massive positively charged nucleus.
b) electrons exist in regions of space called orbitals.
c) electrons exist in specific energy levels.
d) neutrons are present in the nucleus.

3. One of Rutherford's contributions to atomic theory is the idea that…
a) the atom has a massive positively charged nucleus.
b) electrons exist in regions of space called orbitals.
c) electrons exist in specific energy levels.
d) neutrons are present in the nucleus.

4. A sample of gas is electrically charged so that it glows red. The red color is emitted from the gas when…
a) electrons in the gas sample are excited into new energy levels.
b) electrons in the gas sample return to their ground state energy levels.
c) protons in the gas sample are excited into new energy levels.
d) protons in the gas sample return to their ground state energy levels.

5. Light which has a long wavelength has _____energy and a _____ frequency.
a) high, high b) low, high c) high, low d) low, low

6. Light which has a short wavelength has _____energy and a _____ frequency.
a) high, high b) low, high c) high, low d) low, low

7. T or F. Modern atomic theory teaches that electrons orbit the nucleus of an atom much like planets orbit the sun.

8. Orbitals are regions of space where a/an _____ is likely to be located.
a) proton b) electron c) neutron d) nucleus

9. The atomic mass unit (amu) is based on an atom of _____.
a) carbon-12 a) carbon-13 a) carbon-14 a) hydrogen

10. What is the maximum number of electrons that can fit into a p ***orbital***?
a) 1 b) 2 c) 6 d) 10 e) 14 f) 18

11. What is the maximum number of electrons that can fit into a f **sublevel**?
a) 1 b) 2 c) 6 d) 10 e) 14 f) 18

12. Which of the following is an invalid orbital designation?
a) 1s b) 3d c) 2p d) 4f e) 2d

Matching:
a) Hund's Rule b) Aufbau Principle c) Pauli Exclusion Principle

B 13. States that electron filling begins with lowest energy orbitals first.

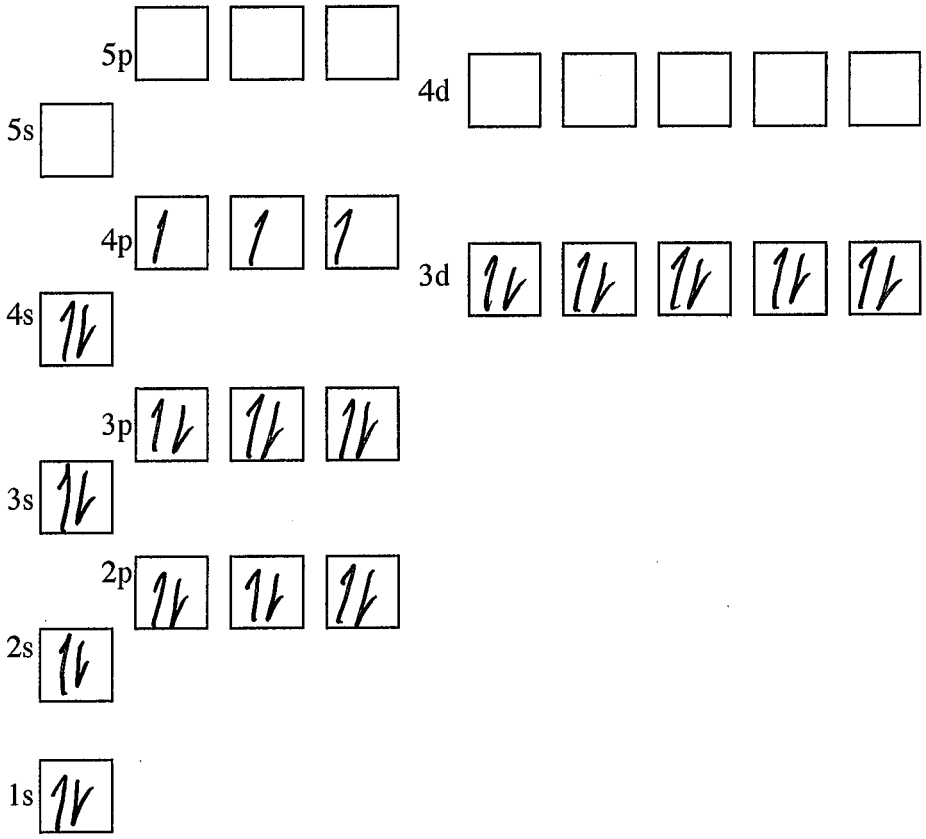
A 14. States that electrons fill orbitals of the same energy by adding one electron to each orbital, and then doubling up.

C 15. States any orbital can hold a maximum of two electrons, each with opposite spins.

Fill in the blank:

16. An atom is the smallest unit of an element which retains the properties of that element.

17. Fill the orbital diagram for Arsenic (As)



18. Arrange the following sublevels in order of increasing energy.

4d, 4f, 5s, 5p, 5d, 5f, 6s, 6p, 6d, 7s, 7p

$5s^2, 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^{14} 6d^{10} 7p^6$

19. Write the full electron configuration for Cl. 17e⁻

$1s^2 2s^2 2p^6 3s^2 3p^5$

20. Write the full electron configuration for Ba. 56e⁻

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$

21. Write the shorthand electron configuration (noble gas configuration) of Co. 27e⁻

$[Ar] 4s^2 3d^7$

22. Write the shorthand electron configuration (noble gas configuration) of Pb. 82e⁻

$[Xe] 6s^2 4f^{14} 5d^{10} 6p^2$

23. Write the outer electron configuration (battleship notation) for Hg (only the last sublevel).

$5d^{10}$

24. Write the outer electron configuration (battleship notation) for Sb (only the last sublevel).

$5p^3$

25. Use the following data to calculate the average atomic mass of chromium.

ISOTOPES	MASS (amu)	Percent Abundance
Cr-50	49.946	4.35
Cr-52	51.941	83.8
Cr-53	52.941	9.5
Cr-54	53.939	2.35

SHOW YOUR WORK AND CIRCLE FINAL ANSWER.

$$\frac{(49.946 \cdot 4.35) + (51.941 \cdot 83.8) + (52.941 \cdot 9.5) + (53.939 \cdot 2.35)}{100}$$

Atomic Structure Chart

No.	Element	Symbol	Protons	Neutrons	Electrons	Mass	Charge
1	FLUORINE	F	9	10	10	19	-1
2	Carbon	C	6	8	2	14	+4
3	ALUMINUM	Al	13	14	10	27	+3
4	XENON	Xe	54	77	54	131	0
5	PHOSPHORUS	P	15	16	18	31	-3
6	SULFUR	S	16	16	18	32	-2
7	POTASSIUM	K	19	20	18	39	+1
8	IODINE	I	53	74	54	127	-1
9	ARGON	Ar	18	22	18	40	0
10	LEAD	Pb	82	125	78	207	+4
11	IRON	Fe	26	30	24	56	+2
12	SILICON	Si	14	14	10	28	+4
13	CALCIUM	Ca	20	20	18	40	+2
14	MAGNESIUM	Mg	12	12	10	24	+2
15	CHLORINE	Cl	17	18	18	35	-1
16	TITANIUM	Ti	22	25	20	47	+2
17	MERCURY	Hg	80	120	78	200	+2
18	TUNGSTEN	W	74	110	70	184	+4
19	TIN	Sn	50	69	46	119	+4
20	SILVER	Ag	47	61	47	108	0