Sturman

* You may only use the periodic table that I have provided!

Name Sturman key
Partner's Name _____
Period ____ Date _____

Quiz: Electrons in Atoms

**Fill in each blank with the correct number or the most accurate, descriptive term.*

1. It requires more energy to move an electron from ground state to the second energy level than to move an electron from the fourth energy level to the fifth energy level.

2. The speed of a gamma ray in air is the same as the speed of a microwave in air.

3. The unit of frequency is hertz or Hz or s^{-1}.

4. The maximum distance of a wave from its equilibrium position is called amplitude

5. The number of possible energy levels is 7.

6. The principle quantum numbers start with n=1 and end with n= 7.

7. The fifth energy level has 16 orbitals. $s^1 p^2 d^{10} f^{14}$

8. The third energy level can have a maximum of 18 electrons. $s^2 p^6 d^{10} f^{14}$

9. It is possible for two electrons to occupy the same orbital only is they have opposite spin since then their magnetic fields will cancel.

10. White light emits a continuous light spectrum.

**Answer the following questions and solve the following problems. As always, show your work!*

11. The element with this electron configuration [Kr]4d¹5s² is Yttrium.
36 + 3 = 39

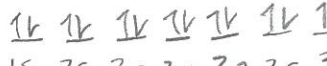
$c = \lambda\nu$ $\quad c = 3.00\times10^{8}\ m/s$

$E = h\nu$ $\quad h = 6.63\times10^{-34}\ J\cdot s$

oops! 14

+3 12. Write the orbital diagram and electron configuration for silicon. ~~The element with this electron configuration [Kr]4d¹5s² is~~ _____

1s 2s 2p 3s 3p 3d 4s 4p 4d 4f 5s 5p 5d 5f 6s 6p 6d 6f 7s 7p 7d 7f



← orbital diagram

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

$[Ne]\ 3s^2 p^2$ > either one is okay for the e⁻ configuration

+2 13. What is the frequency of an x-ray that has a wavelength of 10.0 nm?

$c = \lambda\nu \quad 3.00\times10^{8} = (10.0\times10^{-9}\ m)\nu$

$\nu = 3.00\times10^{16}\ s^{-1}$

+2 14. What is the energy of this wave?

$E = h\nu$

$= 6.63\times10^{-34}(3.00\times10^{16}\ s^{-1})$

$= 1.989\times10^{-17}$

$= 1.99\times10^{-17}\ J$

18 poss

≥ 16¼ A

14½ – 16 B

12¾ – 14¼ C

10¾ – 12½ D

≤ 10½ F