

Name: _____

Date: _____

Quantum Number Worksheet

Question 1. What is the total number of orbitals associated with the principal quantum number $n = 3$?

Question 2. Using s, p, d, f notations, describe the orbital with the following quantum numbers

(a) $n = 2, l = 1$

(b) $n = 4, l = 0$

(c) $n = 5, l = 3$

(d) $n = 3, l = 2$

(f) $n=1, l=0$

(g) $n=4, l=3$

Question 3. Which of the following sets of Quantum is not possible

(a) $n = 0, l = 0, m = 0, m = 1/2$

(b) $n = 1, l = 0, m = 0, m = -1/2$

(c) $n = 1, l = 1, m = 0, m = -1/2$

(d) $n = 2, l = 1, m = 0, m = -1/2$

(e) $n = 3, l = 3, m = -3, m = 1/2$

(f) $n = 3, l = 2, m = 0, m = 1/2$

(g) $n = 1, l = 1, m = 0, s = +1/2$

Name: _____

Date: _____

Question 4. The quantum numbers of six electrons are given below.

i. $n = 4, l = 2, m_l = -2, m_s = -1/2$

ii. $n = 3, l = 2, m_l = 1, m_s = +1/2$

iii. $n = 4, l = 1, m_l = 0, m_s = +1/2$

iv. $n = 3, l = 2, m_l = -2, m_s = -1/2$

v. $n = 3, l = 1, m_l = -1, m_s = +1/2$

vi. $n = 4, l = 1, m_l = 0, m_s = +1/2$

Answer below questions

(a) which of the electrons are in same energy level

(b) which of the electron is having lowest energy

(c) which of the electron is having highest energy

Question 5. The total number of electrons that can be accommodated in all the orbitals having principal quantum number 3 azimuthal quantum number 1 is

(a) 2

(b) 4

(c) 6

(d) 8

Name: _____

Date: _____

Question 6. The principal quantum number of an atom represents

- a. Spin Angular momentum
- b. Size of the Orbital
- c. Orbital Angular momentum
- d. Space orientation of the orbital

Question 7. A p-orbital can accommodate

- a. 4 electrons
- b. 6 electrons
- c. 2 electron with opposite spins
- d. 2 electron with parallel spins

Question 8. What are n , l , m values for electrons in below orbitals

a. $2p_x$

b $4p_y$

c. $3p_z$

Question 9. An electron is in one of the 3d orbitals. Give the possible values of n , l and m_l for this electron.

Name: _____

Date: _____

Question 10. Principal, azimuthal and magnetic quantum numbers are respectively related to

- a. Size, shape and orientation
- b. Shape, size and orientation
- c. Size, orientation and shape
- d. None of the above

Question 11. What is the maximum number of electrons that may be present in all the atomic orbitals with Principal quantum number 3 and azimuthal quantum number 2 ?

- (a) 10
- (b) 18
- (c) 12
- (d) 14

Question 12. Designate the Orbitals having

- (a) $n=2, l=1$
- (b) $n=4, l=0$
- (c) $n=3, l=2, m=\pm 2$
- (d) $n=3, l=2$

Name: _____

Date: _____

Question 13. Write down all the Four quantum numbers of the fourth electron of Be($Z=4$)

Question 14. Write the orbital Notation for the following set of Quantum Numbers

(a) $n=1, l=0, m=0$

(b) $n=3, l=2, m=-1$