The Atomic Structure reTest

READ ALL QUESTIONS CAREFULLY!! and **Answer Correctly!**

1. This man said that matter was made of atoms and that all atoms of the same element were identical.

a. Heisenberg b. Dalton c. Schrodinger d. Bohr e. Thomson

2. This man said that if you saw an electron you would change where it is going.

a. Heisenberg b. Dalton c. Schrodinger d. Bohr e. Thomson

3. This man found that cathode rays were actually electrons. They responded to bar magnets

a. Heisenberg b. Dalton c. Schrodinger d. Bohr e. Thomson

4. This man found that electrons exist at definite energy distances from the nucleus.

a. Heisenberg b. Dalton c. Schrodinger d. Bohr e. Thomson

5. This man used quantum numbers to describe probable locations of electrons

a. Heisenberg b. Dalton c. Schrodinger d. Bohr e. Thomson

6. Describing the location of electrons in atoms works best when electrons are treated as:

a. a particle b. a wave c. energy d. none of these

7. How many protons would you expect to find in Carbon-12?

a. 2 b. 6 c. 8 d. 14

8. How many neutrons would you expect to find in Carbon-12?

a. 2 b. 6 c. 8 d. 14

9. What is the atomic mass of Carbon-12?

a. 2 b. 6 c. 8 d. 14 e. 12

10. Two atoms of the same element with uneven numbers of protons and electrons are known as:

a. ions b. isotopes c. isomers d. atoms of the same element must have the same mass

11. How many electrons would you expect to find in an ion of sodium that has a +1 charge?

a. 2 b. 6 c. 8 d. 10 e. 12

12. How many electrons would phosphorus need to gain in order to have eight electrons in its outer shell?

a. 1 b. 2 c. 3 d. 4 e. 6

13. Which of the following is equal to the number of protons in a positive ion?

a. electrons b. neutrons c. both of these d. neither of these

14. A certain atom consists of 20 protons, 21 neutrons, and 18 electrons. It's mass number is:

a. 34 b. 2 c. 18 d. 16 e. none of these

15. Atoms that have absorbed energy contain electrons in:

a. the ground state b. an excited state c. the nucleus

16. What is the number of sublevels in the fourth principal energy level?

a. 1 b. 2 c. 3 d. 4

17. If an atom containing 16 electrons gained one, its charge would be:

a. +1 b. -1 c. 0 d. low

18. What is the highest energy sublevel in Fe? (highest energy, **not** outer shell)

a. 2d b. 3d c. 4s d. 3p

19. Which of the following sublevels is in the outer shell of Cl?

a. 2d b. 3d c. 4s d. 3p

20. The quantum number that give the most information about distance from the nucleus is:

a. n b. l c. m d. s

21. The quantum number that designates an orbital's orientation in space is:

a. n b. l c. m d. s

22. The **number of values** of the magnetic (m) quantum number determines:

a. the number of electrons in the atom
b. the number of orbitals
c. the number of sublevels
d. the energy level

23. When the secondary quantum number(l) is 4, the magnetic number(m) can have values of:

a. -1, 0, 1 b. -3,-2,-1,0,1,2,3 c. 0,1,2 d. 1,2,3 e. none of these

24. The number of electrons that can occupy the f sublevel is:

a. 10 b. 6 c. 2 d. 14 e. none of these

25. Which of the following sublevels has the longest wavelength?

a. 1s b. 2s c. 3s d. 4s e. 5s

26. All the elements in group IIa (2) have an outer electron configuration that ends in:

a. p^1 b. p^2 c. s^1 d. s^2 e. none of these

27. An irregularity in the aufbau(filling) order would most likely occur in:

a. Mg b. Cd c. Ag d. S

28. How many electrons are in the outer shell of tin?

a. 2 b. 3 c. 5 d. 7 e. none of these

29. When an atom absorbs energy, its energy:

a. decreases by a definite quantity
b. decreases by an indefinite quantity of any magnitude
c. increases by a definite quantity
d. remains the same

30. The release of a quanta of energy by an atom:

a. increases its energy by $h\nu$
b. decreases its energy by $h\nu$
c. creates part of an emission spectrum
d. causes no change in energy
e. more than one of these

31. For a d sublevel, the number of values of m is:

a. 3 b. 5 d. 10 e. 2

32. For a p sublevel, the l value is:

a. 0 b. 1 c. 2 d. 3

33. The electron configuration for Ti ends in:

a. p^3 b. d^3 c. f^2 d. p^2 e. none of these

34. Which of the following elements would you expect to be most likely to obey the aufbau (filling order) rule?

a. Cr b. Mo c. Ag d. La e. S

35. The orbital notation for tin would could contain____unpaired electrons.

a. 3 b. 6 c. 5 d. 2

36. Which pair has the same electron configuration?

a. Ne and Mg^{+2} b. Cl^- and Na^+ c. Na^+ and Li^+ d. S and Ar

37. How many pairs of electrons occur in the electron dot diagram of sulfur?

a. 1 b. 2 c. 3 d. 4 e. 5

38. In which of the following do valence p electrons never pair up?

a. Br b. O c. S d. Si e. F

39. Of the following elements, the one having the same s and p electron configuration for n = 2 as Ga does for n = 4 is:

a. Na b. Ni c. Al d. B

40. The symbol of the element in the third series of elements (third row) that has the same electron dot notation as Ba is:

a. Se b. Xe c. Mg d. Ca e. none of these

41. In the 6th series of elements, the first two elements have successive electrons occupying the 6s sublevel. For the next 14 elements, successive electrons usually occupy the orbitals of sublevel:

a. 6p b. 5d c. 3d d. 4f

42. The orbitals in a dot notation are:

a. s b. s, p, and d c. s and p d. s p d f e. s **or** s and p

43. How many 5th energy level electrons are present in Bromine?

a. 2 b. 8 c. 10 d. 50 e. none of these

44. A set of quantum numbers used to indicate and describe an orbital consists of:

a. 5 numbers b. 4 numbers c. 3 numbers d. 2 numbers

45. Two electrons in the same orbital must have ____ quantum numbers in common.

a. 1 b. 2 c. 3 d. 4

Use the following choices for 46- 50. **Answers may be used more than once or may not be used**.

a. d sublevel b. frequency c. wavelength d. photon e. Hund's rule

46. consists of 4 double dumbbells and 1 dumbbell in a doughnut
47. directly proportional to the energy of a photon
48. Is inversely proportional to the frequency of light
49. is used to determine that nitrogen has three unpaired electrons
50. may be expressed as Js^2/kgm

Use the following choices for questions 51 - 55

a. frequency b. emission spectrum c. red d. violet e. Pauli exclusion principle

51. lowest energy light listed
52. shortest wavelength light listed
53. the most quantum numbers shared between two electrons in the same atom is three.
54. increases as the wavelength decreases
55. The result of going back to the ground state