Structure of Atom (Quantum Numbers, Electronic Configuration & Different Principles)

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1.

Which of the following sets of quantum numbers represent an impossible arrangement -

	n	l	m	s
1.	3	2	-2	(+)1/2
2.	4	0	0	(-)1/2
3.	3	2	-3	(+)1/2
4.	5	3	0	(-)1/2

2.

How many unpaired electrons are present in Ni^{2+} cation (atomic number = 28)

1. 0
2. 2
3. 4
4. 6

3.

Number of unpaired electrons in $1s^2\ 2s^2\ 2p^3$ is -

1. 2
2. 0
3. 3
4. 1

4.

The quantum numbers of most energetic electron in Ne atom in first excited state is

1. 2, 1, 0, +1/2
2. 3, 1, 1, +1/2
3. 3, 0, 0, +1/2
4. 3, 1, 0, +1/2

5.

The total number of orbitals having l = 3 is -

1. 3
2. 7
3. 5
4. 9

6.

The total spin resulting for a $3d^7$ configuration is

1. 3/2
2. 1/2
3. 2
4. 1

7.

3p orbital has -

1. Two spherical nodes
2. Two non-spherical nodes
3. One spherical and one non-spherical node
4. One spherical and two non-spherical nodes

8.

How many numbers of orbitals are possible in L-energy level?

(1) 2

(2) 4

(3) 6

(4) 1

9.

Maximum number of electrons in a subshell with l = 3 and n = 4 is

1. 14
2. 16
3. 10
4. 12

10.

The correct set of four quantum numbers for the valence electron of rubidium atom (Z

=37) is

1. 5, 1, 1, +1/2
2. 6, 0, 0, +1/2
3. 5, 0, 0, +1/2
4. 5, 1, 0, +1/2

11.

Consider the following sets of quantum numbers:

	n	l	m	s
(i)	3	0	0	+1/2
(ii)	2	2	1	+1/2
(iii)	4	3	-2	-1/2
(iv)	1	0	-1	-1/2
(v)	3	2	3	+1/2

Which of the following sets of quantum numbers is not possible?

(1) ii, iii and iv

(2) i, ii, iii and iv

(3) ii, iv and v

(4) i and iii

12.

Which electronic configuration must represent an atom in the excited state?

1. $1s^2, 2s^2 2p^1$
2. $1s^2, 2s^2 2p^2$
3. $1s^2, 2s^2 2p^2, 3s^1$
4. $1s^2, 2s^2 2p^5$

13.

Which of the following pairs of d-orbitals will have electron density along the axes?

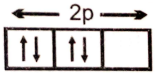
1. $d_{z^2},\ d_{xz}$
2. $d_{xz},\ d_{zy}$
3. $d_{z^2},\ d_{x^2-y^2}$
4. $d_{xy},\ d_{x^2-y^2}$

14.

The angular momentum of an electron in d orbital is equal to

1. $\sqrt{6}$ ~~h~~
2. $\sqrt{2}$ h
3. $2\sqrt{3}$ h
4. 0 h

15.

If the electronic structure of oxygen atom is written as $1s^2,\ 2s^2$ 

it would violate

1. Hund's rule
2. Paulis exclusion principle
3. Both Hund's and Pauli's principles
4. None of these

16.

The correct order of total number of node of atomic orbitals is:

1. 4f > 6s > 5d
2. 6s > 5d > 4f
3. 4f > 5d > 6s
4. 5d > 4f > 6s

17.

Which of the following orbitals has two spherical nodes?

1. 2s
2. 4s
3. 3d
4. 6f

18.

The quantum number not obtained from the Schrodinger's wave equation is -

1. n
2. l
3. m
4. s

19.

The number of electrons with the azimuthal quantum number l = 1 and 2 for $_{24}Cr$ in ground state are:

1. 16 and 5
2. 12 and 5
3. 16 and 4
4. 12 and 4

20.

An ion with mass number 56 contains 3 units of positive charge and 30.4% more neutrons than electrons. What is the symbol to this ion?

1. $^{56}_{26}Fe^{3+}$
2. $^{57}_{26}Fe^{3+}$
3. $^{58}_{27}Fe^{3+}$
4. $^{56}_{25}Fe^{3+}$

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