ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION-16(CLASS-11)

TOPIC- STRUCTURE OF ATOM

SUBTOPIC- QUANTUM NUMBER

SUBJECT – CHEMISTRY
DURATION – 30 mins

F.M. - 15
DATE -02.07.20

1.1 **How many orbitals can have the following set of quantum number(s):**

$n = 3, l = 1, m_1 = 0$

(a) 3 (b) 1 (c) 4 (d) 2

Ans. b

1.**2** **Electronic configuration of the outer shell of the element Gd with atomic number 64 is:**

(a) $4f^4\ 5d^5\ 6s^1$ (b) $4f^3\ 5d^5\ 6s^2$ (c) $4f^5\ 5d^4\ 6s^1$ (d) $4f^7\ 5d^1\ 6s^2$

Ans. d

1.3 **Maximum number of electrons in a subshell can be:**

(a) $4l + 2$ (b) $4l - 2$ (c) $2n^2$ (d) $2l + 1$

Ans. a

1.4 **The orientation of atomic orbitals depends on their:**

(a) Spin quantum number (b) magnetic quantum number (c) azimuthal quantum number

(d) Principal quantum number

Ans. b

1.5 **Number of unpaired electrons in N^{2+}:**

(a) 3 (b) 1 (c) 2 (d) 0

Ans. b

1.6 **If the electronic structure of oxygen atom is written as $1s^2\ 2s^2\ 2p^4$ it would violate:**

(a) Hund's rule (b) Pauli's exclusion principle (c) Both Hund's and Pauli's principles

(d) None of these

Ans. d

1.7 **Which quantum number(s) do 2s and 2p orbitals have in common?**

(a) n and l (b) n (c) l and ml (d) l

Ans. b

1.8 **For a principal quantum number n, how many atomic orbitals are possible?**

(a) n^2 (b) n+ 1 (c) 2n (d) n

Ans. d

1.9 **Which set of quantum numbers uniquely defines one of the electrons in an atomic orbital with n = 2 and l = 0?**

(a) n = 2, l = 0, m_l = 1, m_s = +½ (b) n = 2, l = 0, m_l = 0, m_s = +½

(c) n = 2, l = 0, m_l = 1, m_s = +1 (d) n = 2, l = 0, m_l = 0, m_s = +1

Ans. b

1.10 **Element Z has the ground state electronic configuration $1s^2 2s^2 2p^3$. In which group does it belong?**

(a) 5 (b) 15 (c) 3 (d) 13

Ans. b

1.11 **A set of orbitals for which the quantum number l = 2 is:**

(a) 7-fold degenerate b) non-degenerate c) 3-fold degenerate d) 5-fold degenerate

Ans. d

1.12 **For the principal quantum number n = 4, it is possible to have:**

(a) only s and p orbitals b) only s, p, d and f orbitals c) only an s orbital d) only s, p and d orbitals

Ans. b

1.13 **"No two electrons in atom can have the same set of all four quantum numbers"-**

(a) Pauli's exclusion principle (b) Hund's rule of maximum spin multiplicity

(c) The Aufbau Principle (d) None of these

Ans. a

1.14 **The electronic configuration of Cr is:**

(a) $[Ar]4s^2 3d^4$ (b) $[Ar]4s^1 3d^4$ (c) $[Ar]3d^6$ 9d) $[Ar]4s^1 3d^5$

Ans. d

1.15 **Find the number of unpaired electrons present in Fe^{2+}:**

(a) 6 (b) 4 (c) 5 (d) 3

Ans. b

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