	INDIAN SCHOOL AL WADI AL KABIR	
Class XI	**Department of Science 2021-2022** **SUBJECT : CHEMISTRY**	**Date of Submission: 04.09.2021**
Work sheet No.:2 with answers	**Chapter: The structure of atom**	**Note: A4 File format**
Name of the student:	**Class & Section:**	**Roll No.**

MULTIPLE CHOICE QUESTIONS

1. The value of Azimuthal quantum number for all the electrons in the 5p orbital is
   a. 4 b. 5 c. 2 d.1

2. Among the various quantum numbers (n, l, m, s) describing an electron, which can have the largest value?
   a. Principal Quantum number b. Azimuthal Quantum number
   c. Magnetic Quantum number d. Spin Quantum number

3. Which of the following orbitals are not possible
   a. 2d b.4f c. 6d d. 3g

4. The maximum number of electrons in a subshell for which $l = 3$ is
   a. 14 b. 10
   c. 8 d. 4

5. What are the values of n and l for 2p orbital?

   a. n= 1, l=1 b. n=2, l=2
   c. n=2, l=1 d. n= 3, l=2

6. If the largest value of m for an electron is +2, then the electron may be present in what type of sub shell?

   a. s subshell b. d subshell
   c. p subshell d. f subshell

7. An electron has spin quantum number $m_s = +1/2$ and magnetic quantum number $m_l = +1$. It cannot be present in
   a. s orbital b. p orbital
   c. d orbital d. f orbital

8. How many unpaired electrons are present in Ni^{2+}?

a. 8 b. 3
c. 2 d. 0

9. The number of radial nodes in 3s and 2p respectively are

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

10. Which one of the following pairs of ions have the same electronic configuration?

a. Cr^{3+}, Fe^{3+} b. Fe^{3+}, Mn^{2+}
c. Fe^{3+}, Co^{3+} d. Sc^{3+}, Cr^{3+}

Assertion- Reasoning Questions

(A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
(B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
(C) Assertion is correct, but reason is wrong statement.
(D) Assertion is wrong, but reason is correct statement.

1. Assertion (A): It is impossible to determine the exact position and exact momentum of an electron simultaneously.

   Reason (R): The path of an electron in an atom is clearly defined.

2. Assertion (A): The 19^{th} electron in Potassium atom enters into 4 s orbital ad not in the 3d orbital.
   Reason (R): (n+l) rule is followed for determining the orbit of lowest energy state.

3. Assertion (A): The energy of an electron is largely determined by the principal quantum number.
   Reason (R): The principal quantum number is a measure of the probable distance of finding the electron around the nucleus.

4. Assertion: For the outermost electron in Na atom the orbital angular momentum is zero.
   Reason: For 3s electron=0 and orbital angular momentum is 0.

5. Assertion: The configuration of C cannot be $1s^2,2s^2,2px^2$
   Reason: According to Pauli's exclusion principle an orbital can have maximum of two electrons.

6. Assertion: Cl^- ions and K^+ ions are isoelectronic
   Reason: Isoelectronic ions have same charge

7. Assertion: Number of orbitals in 3rd shell is 9.
   Reason: Number of orbitals for a particular value of n = n^2

Passage based MCQs

Passage 1

The position and energy of an electron is specified with the help of four quantum numbers namely principal quantum number, azimuthal quantum number, magnetic quantum number and spin quantum number. The permissible values of these are:

n=1, 2…….

l= 0, 1, 2… (n-1)

ml = -l ….0 ……. +l

ms = +1/2 and -1/2

The electrons having the same value of n, l and ml are said to belong to the same orbital. According to Pauli's exclusion principle, an orbital can have maximum of two electrons and these must have opposite spin.

1. For an electron having n=3, *l*=0, the orbital angular momentum quantum number is
   (a) $\sqrt{3}h/\pi$ (b) $\sqrt{6}h/2\pi$ (c) Zero (d) $8\sqrt{3}h/\pi$

2. Which of the following statements is not correct?
   (a) For Sodium, the outermost electron has n=3, *l*=0, ml=0, ms=+1/2
   (b) The orbitals having n=3, *l*=2, ml=+2 and n=3, *l*=2, ml=-2 have same energies
   (c) For 4f electron, n=4, *l*=3, ml=0, s=+1/2 is not possible
   (d) The orbitals 2d,3f and 4g are not possible

Passage II

The atomic number of Chromium is 24.Its electronic configuration in ground state is [Ar] $3d^5$ $4s^1$ Chromium atom loses 3 electrons to form Cr^{3+} ions.

1. The number of unpaired electrons in Cr^{3+} ions is
   (a) 3 (b) 6 (c) 1 (d) 5
2. The number of electrons having n=3 and m_l =0 in Chromium atom is
   (a) 2 (b) 5 (c) 4 (d) 1
3. The number of occupied subshells in Cr^{3+} ion is
   (a) 3 (b) 4 (c) 5 (d) 6

Answers

Qn No	Answer
MCQ s	
1	d
2	a
3	a
4	a
5	c
6	b
7	a
8	c
9	a
10	b
Assertion Reasoning Questions	
1	c
2	a
3	a
4	a
5	b
6	c
7	a
Passage based Questions	
Passage 1	
1	c
2	c
Passage 2	
1	a
2	b
3	d

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